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**IMPACTS OF ABRUPT CLIMATE CHANGE ON NATIONAL  
SECURITY: THE UNITED STATES PERSPECTIVE ON  
HOMELAND DEFENSE IN THE NORTH AMERICAN ARCTIC**

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It is aim of the author to support through this work the third mission developed by the University of Milan for the achievement of UN Sustainable Development Goals, goal no. 13: *take urgent action to combat climate change and its impacts.*

*“Who are you?” asked Colwell.  
The man made no answer, staring at him vacantly.  
“Who are you?” again.  
One of the men spoke up: “That’s the Major – Major Greely.”  
Colwell crawled in and took him by the hand, saying to him, “Greely, is this you?”  
“Yes,” said Greely in a faint, broken voice, hesitating and shuffling with his words,  
“Yes – seven of us left – here we are – dying – like men. Did what I came to do – beat the  
best record.”*

(“The Rescue of Greely”, Schley 1885, p. 223)

*“(…) the damn thing melted.  
The Arctic ice caps are as small as they’ve been in my lifetime.”*

(Admiral Richard Spencer, US Secretary of the Navy,  
to US Naval Institute reporter,  
USNI News, 2018)

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## ABSTRACT

The purpose of this research is to assess whether abrupt climate change (intended as a major change in physical geography) can be a driver for national security planning. To demonstrate that geography still affects national security planning, this research retrieves the concept of environmental causality and to test the persisting validity of environmental causality, an empirical case has been selected – that of US adaptation to climate change for homeland defense in an area called “The North American Arctic.” Consequently, it frames the adaptation process into a causal mechanism where *proximity to climate change effects*, experienced by some actors of the defense domain, is the cause explaining the change of the United States (US) geostrategic posture in the Arctic.

Indeed, one of the most severe impacts climate change is having on US national security regards its homeland defense in the Arctic. Traditionally the US was granted continental defense thanks to its invulnerability in the Northern hemisphere. Still, with the Arctic gatekeeper's collapse caused by climate change, US homeland defense may be at stake. According to the environmental probabilistic perspective (here adopted), the fact that climate change is shaping the physical conformation of the Arctic is not necessarily acknowledged by policy-makers or military leaders since geography does not dictate predetermined outcomes. It follows that to consider climate change as a driver, it must be found consistent evidence that actors are including climate change in national security planning and reacting to its impacts.

To do so, the research reconstructs the process of adaptation to climate change in the North American Arctic from the point of view of the actors involved in homeland defense and looks for the cause and the contextual factors of the process. This process is evaluated through two concepts: *identification* and *management*. Evidence is measured through indicators made by both institutional statements and actions. The research then provides systematic qualitative data (e.g., strategies, reports, grey literature, journal articles, newspaper interviews) triangulated with some élite interviews with climate security experts and government officials.

Through the framing of evidence into a causal mechanism supporting the hypothesis of *conscious adaptation*, it is demonstrated that 1) proximity to geographical change can account for a revitalization of the US Arctic posture with a growing concern over homeland defense itself and 2) that climate change can act, in the presence of some contextual factors, as a driver for national security planning at all levels of strategy. Finally, the research underlines the enduring importance that geography can have for national security planning and policy-making.



## LIST OF ABBREVIATIONS

AFB	Air Force Base
ALCOM	Alaskan Command
AMAP	Arctic Monitoring and Assessment Programme
AoR	Area of Responsibility
BMWES	Ballistic Missile Early Warning System
CDRUSNORTHCOM	Commander of the US Northern Command
CNA	Center for Naval Analyses
CNO	Chief of Naval Operations
DEW	Distant Early Warning Line
DHS	Department of Homeland Security
DoD	Department of Defense
ECWCS	Extended Cold Weather Clothing System
EEZ	Exclusive Economic Zone
GAO	Government Accounting Office
GDP	Gross Domestic Product
HA/DR	humanitarian assistance and disaster relief
IGY	International Geophysical Year
IPCC	Intergovernmental Panel on Climate Change
IPY	International Polar Year
IR	International Relations (discipline)
JCS	Joint Chiefs of Staff
JTF-AK	Joint Task Force-Alaska
NATO	North Atlantic Treaty Organization
NDAA	National Defense Authorization Act
NDS	National Defense Strategy
NOAA	National Oceanic and Atmospheric Administration
NORAD	North American Aerospace Defense Command
NORTHCOM	Northern Command
NSC	National Security Council
NSS	National Security Strategy
QDR	Quadrennial Defense Review
SAC	Strategic Air Command
SIPRE	Snow, Ice and Permafrost Research Establishment
TFCC	Task Force Climate Change
UCP	Unified Command Plan
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
US	United States

# INTRODUCTION

The environment has always affected human activities, and humans have modified it through technology, not only for domestic purposes but also to conduct foreign policy – through war as well. From Ancient Greece to the Vietnam war, geography has played a fundamental role in policy-making, threat assessment, strategic planning, and tactics. On the one hand, geography conditioned human choices, since some geographical features posed challenges that could not be overcome (Mackinder 1904, 437; Spykman 1938, 28-29): while landlocked states usually prioritize threat coming from neighbor states, insular powers are granted major defense thanks to the distance from mainland adversaries and competitors; natural harbors and coast lines affect the degree of relative external invulnerability of states, while internal size and shape condition the degree of national control and government strength. On the other hand, people developed technologies to shorten distances by building railways and steamships or overcoming geographic obstacles and defensive lines by airplanes striking from the sky (Douhet 1932; Strausz-Hupé 1942; Liddell Hart 2007 [1942] 29-30; 1946). The nuclear age has even reinforced the idea of the overcoming of geographic factors (Wohlstetter 1968). After the end of the Cold War, the thesis of the “end of geography” (O’Brien 1990; Friedman 2006) has become attractive in front of the globalization fostered by media and social networks and by commercial and financial flows.

While literature and policy-making have progressively abandoned the analysis of the conditioning role of geography, during the 1970s, it has been recognized that global warming was changing fundamental geographical factors that were once taken for granted. Scientists, and then public opinion and policy makers, realized the existence of *abrupt climate change*: average global temperatures were rising at a rate that was probably faster than at any time over the past 10,000 years (Houghton 2009, 14-15). The rise of global average temperature, causing extreme weather events, affects human activities differently from past climate changes: it is now widely recognized that geography, the most permanent factor for foreign policy making (Spykman 1938, 28), is changing, drawing different geographies *at a much higher rate* than during past climate changes and reshaping traditional geopolitical mental frameworks. Consequently, policymakers and analysts must deal with new mental frames through which they observe reality and react.

National security is already coping with the effects of climate change through *mitigation* (the stabilization of the levels of greenhouse gases in the atmosphere), but mostly through *adaptation* (the adjustment to climate change effects). The high politics of the international system’s superpower is not exempted. In 2007 a groundbreaking report was published by the Center for Naval Analyses (CNA) Military Advisory Board concerning climate change impacts on US armed forces and geostrategic posture (CNA 2007). One year later, Joshua Busby published an article on *Security Studies* demonstrating that “a focus on climate change and U.S. national security is a valid subject of inquiry” (2008, 503). In 2010, finally, the *Quadrennial Defense Review* cataloged climate change as a “key geopolitical trend” (US Department of Defense 2010, 6-7). More recently, environmental issues have also been

included in *The Oxford Handbook of U.S. National Security* (Gvosdev, Reveron, and Cloud 2018). Today, do not be misled by the idea that Trump's federal policies totally marginalized the need for an urgent response to climate change. On the contrary, the US military establishment's declarations and actions have emerged as some of the clearest voices about climate change, addressing urgency, adaptation, and resilience, even during skeptical and denialist policies. As it will be found at the end of the analysis, the case of denialist federal policies makes the claim that *changes in physical geography do shape national security planning* even more robust.

As far as the US is concerned, climate change consequences on national security are particularly impressive if compared to the classical Anglo-Saxon Geopolitics *tenets*, especially to the traditional concept of the American continent's insularity<sup>1</sup>. Probably nothing more than the impenetrable polar ice cap, granting continental defense to the US, has been conceived as a global bulwark fostering the fantasies and the ambitions of daring explorers at the quest of the Northwest Passage or the Pole. But today, melting ice is opening new naval routes, while storms and typhoons are canceling human-made facilities, and coastal erosion and rising sea-level are reshaping states' borders. In September 2007, the (partial) opening of the Northwest Passage (a sea shortcut that connects the Atlantic to the Pacific through the Arctic Ocean) was certified by the European Space Agency: the melting of arctic ice is making it possible for ships to sail 4,000 miles from Asia to Europe through America, and vice versa, avoiding the Panama Channel. Extreme weather events, such as heatwaves or hurricanes, both on the East and West Coast, close to the Mexican border and in Alaska, are affecting the US with increased intensity and frequency, producing devastating effects on ecosystems and man-made infrastructures, including military facilities suffering from flooding, wildfire, permafrost thawing, or hurricanes. As geography changes, also strategy must adapt. At the very beginning of the "narrative" proposed in this research, naval historian Gary E. Weir in his essay on under-ice operations in the Arctic, expressed a fundamental issue for the Navy and the oceanographic community:

"[I]n recent years the dramatic recession of the Arctic ice cap during the summer months has opened new commercial possibilities and dramatic new strategic questions. Data gathered in large part by US submarines in cooperation with the National Oceanic and Atmospheric Administration (NOAA) has enabled scientists to suggest with a great degree of certainty that the Arctic ice will begin to disappear completely each summer by the end of this century. The process has already begun. The summer season recession is already dramatic and obvious" (Weir 2005, 412).

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<sup>1</sup> The concept of "Anglo-Saxon Geopolitics" is retained from Bordonaro (2012).

At a higher level, also geopolitical theory is challenged. At the moment, the US homeland<sup>2</sup> itself is affected by two extensive and undeniable changes, which do impact not only on strict homeland defense but also on its “more-than-physical defence” (Tucker 1972), affecting the very existence of a buffer zone granting the US defense from the North (affected by ice melting) and jeopardizing US power projection (due to coastal flooding and extreme weather events ravaging military infrastructure). The first point will be at the center of the whole analysis.

### **1. Research design: an overview**

But, if *the US is reacting to climate change effects, to what degree?* It should be noted that pure physical changes in the empirical world do not entail immediate and pre-determined reactions in decision-making élites, contrary to Environmental Determinism. As argued by Neoclassical realists, the transmission belt linking material capabilities and foreign policy is an imperfect one (Rose 1988). Literature also outlines how the significance of geographical facts differs from community to community, and even non-human environmental factors may sometimes not be perceived or reacted to (Sprout and Sprout 1965, 11). They can even be purposefully ignored since acknowledgment might generate excessive pressures on politics (Jervis 2006, 648).

As it will emerge in Chapter III, this is particularly evident in the case of the US. While the scientific community, historically a close partner of the Department of Defense, has been studying climate change effects (including, later, also polar amplification) since the 1950s, climate change entered US national security only in the second half of the 2000s, apparently unaffected by the environmental debate that was taking place in the domestic political arena

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<sup>2</sup> The discourse is here restricted to the impacts on the homeland and does not address the impacts of climate change at the international level (such as the increasing number of humanitarian assistance and disaster relief missions and external interventions, ranging from peace-keeping to logistic support) which are generally debated in academic literature and grey literature. For an empirical and extensive account on how climate change can affect national security on a plurality of levels (on the homeland, regionally, globally) in the US case, see Busby (2008) and Klare (2019).

in the 1990s<sup>3</sup>. This research argues that climate change can shape national security planning and the geostrategic posture of states. If climate change, re-writing the layout of physical geography, can pose serious concerns for a superpower like the US even in a specific region (the Arctic), then it may be the case to return to seeing geography and especially changes within geography not only as a problem to be solved (through so-called mitigation of climate change) but also as a conditioning factor on national security planning and geostrategy. For this purpose, the research investigates an empirical case in the form of a single-outcome study (Gerring 2007) without the intent of immediate generalization<sup>4</sup>.

The empirical analysis has been temporally and spatially limited. Spatial limits have been applied to the geographical area under analysis (the North American Arctic, defined according to a functional definition of the Arctic provided in Chapter II), whose homeland

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<sup>3</sup> It is not certain when climate change started, but first accounts on human activity influencing climate were drawn up at the beginning of the last century. Pioneer was the steam engineer and amateur climatologist Guy Callendar, who in 1938 delivered a testimony to the Royal Meteorological Society on the effects of increasing carbon dioxide levels on a warming climate. Today, IPCC reports established the “industrial era” as the benchmark for measuring global warming, referring to mid-nineteenth century, when modern industry flourished (Abram *et al.* 2016; see also Weart 2008). Studies on climate were then massively funded by US agencies during Cold War years, but climate change did not become matter of national security at least until the 2000s. It was not until the the development of satellite technology in the 1980s, that accurate measurements became feasible. In those very years, in the US climate change was becoming a political issue, but still not a concern for national security. In 1978, the *National Climate Program* on natural and human-induced climate processes was enacted, while in 1988, the well-known climatologist of NASA James Hansen gave a groundbreaking testimony to the Senate Committee on Energy and Natural Resources, claiming that the changes in temperature experienced at the time were at 99% the result of an increase in the carbon dioxide level in the atmosphere.

<sup>4</sup> It is generally agreed that inferences derived from case studies, even in the case of single-case studies, can be enlarged to multiples cases through *generalization*. Technically speaking, neither the research topic nor the method adopted in the analysis fit the concept of “case-study” intended as a study aimed at the understanding of a population. This is due to the puzzling and broad nature of the outcome and the uniqueness of the case under investigation (i.e., a superpower embedded in a specific temporal context, the context of the US strategic approach to the Arctic). For this reason, the definition of “single-outcome study” (Gerring 2007) has been adopted instead of that of “case-study”. At the same time, the theoretical purpose of the whole research (retrieving environmental causality) makes the primary research question (namely, the validity of environmental causality in national security planning) keep the door open for future case-studies, this time enlarged to the study of a population. Here, the analysis aims at testing whether and how environmental causality worked the case under analysis following the logic of explaining-outcome process-tracing, a method close, but different, to historical and idiographic research. Reasonable generalization on whether and to what extent *proximity to climate change* (see Conclusion) can shape national security planning are thus left to future research.

defense is handled by institutional and non-institutional actors unique to the US case<sup>5</sup>. The period taken into consideration goes from the end of the Cold War (1990) to March 2020, with the addition of a broader analysis aimed at the identification of contextual factors (see Chapter III) that helped in detecting the temporal boundaries of the causal mechanism itself: this “extra” period goes back to the era of polar voyages (since 1850, the first Grinnell expedition's year) to the end of the Cold War.

The research thus addresses the following questions:

- 1) *Is still geography a driver for national security planning?* The general purpose of the research and its primary theoretical value is to revive geography as an *explanans* in International Relations, partially filling the gap in contemporary literature on environmental causality.

It has been chosen an empirical case responding to specific sub-questions that will be presented throughout the research:

- 2) *how is the US adapting to climate change impacts in the North American Arctic, as far as homeland defense is concerned?*

The question, underpinning the empirical case, is derived from evident gaps in the literature on adaptation to climate change, the militarization of climate change, and studies on the US Arctic. By reconstructing how adaptation to climate change impacts in the North American Arctic has been pursued by the selected actors, new material, organized according to a causal mechanism, has been offered to literature;

- 3) *why was the US Arctic posture revitalized?*

The why-question completes the how-question by pointing out the cause(s) and the contextual factors that account for the actual homeland defense strategy in vigor at the end of the year 2019, with particular attention devoted to possible environmental causality.

To respond to those questions, the material gathered will be framed into a causal mechanism following process-tracing method in its explaining-outcome variant (Beach and Pedersen 2013)<sup>6</sup>. The causal mechanism will thus highlight the empirical process through which the actors have engaged in the period 1990-March 2020 in the adaptation to climate change impacts in the North American Arctic. Moreover, process-tracing, centered in the search for causality in the empirical world, fits well the main theoretical objective of the

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<sup>5</sup> Actors under investigation are listed in Chapter II, par. 4.1.3.

<sup>6</sup> Method, as well as hypotheses on the causal mechanism, will be presented in a more detailed way in Chapter II, par. 4.3.

research, namely that of retrieving *environmental causality*, by investigating a *possible* causal role played by climate change (intended, as already said, as a change in physical geography).

It is also worth pointing out that in the variant of process-tracing adopted in this research (Beach and Pedersen 2013), causality is not expressed in terms of variables since mechanisms are not conceptualized as intervening variables connecting X(s) and Y, contrary to the influential essay by Gary King, Robert Keohane, and Sydney Verba (1994)<sup>7</sup>. In line with the probabilistic understanding of mechanisms adopted by those authors, “mechanisms are simply chains of intervening variables that connect the original posited cause and the ultimate effect” (Falleti and Lynch 2009, 1146), and, consequently, the typology of research they propose aims at investigating variance through the study of correlations and conditional probabilities among variables (including intervening variables, at least in the case of causal inference). Such an approach well fits large-n studies or just studies that are not so significantly focused on the unboxing of the causal mechanism. In this research (a single-case study aiming to reconstruct a specific, quasi-historically tailored, empirical process), a deterministic assumption of causality has been adopted, following Mahoney (2008). Thus, it has been opted to focus on the strong bond between the mechanism and the empirical world rather than on variance that, on top of that, has almost no sense in a single-case study. Since variance is not at stake (either the mechanism occurred, or not at all), the research proceeds by detecting causal linkages through the reconstruction of an empirically-situated causal mechanism; then, it aims at finding a *sufficient* cause accounting for the outcome of the mechanism (Beach and Pedersen 2013, 27). Thus, the mechanism has been operationalized into *contextual factors*, *cause(s)*, and the *outcome*.

## 2. Assumptions

Before proceeding with the analysis, some basic assumptions are specified. The research indeed assumes two concepts. The first is *that geography still poses constraints on human activity* and, specifically, on national strategy (Gray 1996). The research adopts a perspective on environmental causality still valuable today but underrated (see Scholvin 2016) and for this reason it does not follow Critical Geopolitics in its purposes and methods. The second is that the physical setting, which was once taken for granted in the geopolitical tradition, centered on geographical constraints, is now changing *because of increasing levels of carbon dioxide emissions in the atmosphere*, at least since the 1950s, at a rate of speed which is exceptionally high (abrupt climate change)<sup>8</sup>.

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<sup>7</sup> King, Keohane, and Verba (1994, 77) define the dependent variable as the “outcome variable”, and the explanatory variables as the “independent variables”.

<sup>8</sup> On contemporary scientific consensus see Cook *et al.* (2013; 2016).

### 3. Relevance of the research

The following traits constitute the overall relevance of the research:

- it is a research on climate change and, in particular, climate change adaptation<sup>9</sup>. The social relevance of academic contributions based on the scientific consensus on global warming and climate change is self-evident. Taking urgent action against climate change is one of the Millennium Development Goals, and it is a worldwide phenomenon, and years 2019-2020 massively showed that even developed countries are suffering from climate change effects, also concerning their national security (see, for example, Leddy 2020). Both adaptation and mitigation are fundamental goals that must be pursued and studied at all levels;
- a research rooted in Geopolitics *and* Realism. *In Geopolitics*: contemporary research on the strategic value of geography and environment causality is quite underdeveloped, but it is still possible and desirable to carry out a research agenda that “will enable us to provide geopolitical insights on phenomena that interest scholars of international relations” (Scholvin 2016, 281). Differently from the developing corpus on climate change by Critical Geopolitics focused on discourse analysis, this research retakes the concept of environmental causality into a geostrategic scenario. *On Realism*: this research fills partially the gap in Realist literature on climate change, which has not addressed climate change extensively although it seriously affects some fundamental assumptions of Realism;
- a research on the US as Arctic state. Although the US is generally neglected in Arctic literature, there are no reasons for overlooking the US, even though it is undeniable that the US Arctic legacy and the role the Arctic plays in US culture and grand strategy is minor in comparison to other Arctic states. Nevertheless, the US is a superpower, and its geostrategic posture is of worldwide importance.

Finally,

- it is an analysis of the US posture on a specific issue, that of the impacts of climate change on homeland defense in the North American Arctic from the perspective of US military leaders and defense officials. The impacts of climate change on US national security have been investigated on various grounds: interesting and valuable insights on such a complex issue have been already proposed from

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<sup>9</sup> As stated by the UN General Assembly, “[A]daptation requires empowering people, building their resilience, securing livelihoods, and putting in place or strengthening the physical infrastructure to protect against weather events as well as the institutions and systems needed to cope with their consequences” (2009, 24).



heterogenous perspectives<sup>10</sup>, but they are not part of mainstream literature. On its part, this research addresses a process neglected in contemporary academic literature (namely, the impacts on homeland defense). For this purpose, sources dispersed in grey literature, reports, and newspapers have been collected systematically; their contextual significance has been enriched with élite interviews, talks, and correspondence with climate security experts and US government officials.

#### 4. Structure

The research is organized as follows. Chapter I is mostly introductory but fundamental for presenting the thesis rationale and its theoretical contribution to the literature. The chapter is centered on the *research puzzle* and *the literature gap* from which the analysis moves on. Firstly, from an empirical input (climate change shaping physical geography) is derived the theoretical puzzle on the implications that changes in physical geography can have on the disciplines of Geopolitics and International Relations. The major trends in the literature on environment and climate change related to state security are presented and analyzed, emphasizing a significant gap in contemporary Realist literature on physical geography and climate change.

Chapter II makes theory flow into a specific empirical case. The first part of the chapter proposes an analytical framework based on the merging of inputs from Neoclassical Realism, Neoclassical Geopolitics, and Ecological Perspective to face the lack of a theoretical ground for the analysis of environmental dynamics, at least according to the main Realist assumptions. It is then outlined how, from the theoretical statement (according to which some environmental dynamics may undermine territorial integrity), a specific empirical case has been selected. The second part of the chapter explains the reasons for the choice of the case of the impacts of climate change on homeland defense in the North American Arctic, and the actors involved in the analysis.

The study is then articulated in three chapters addressing the following issues: the scope conditions of the causal mechanism, the identification of the nexus *climate change-homeland defense* in the North American Arctic, and the management of the impacts of climate change on homeland defense in the North American Arctic. Chapter III is dedicated to the *mechanism's scope conditions*: the analysis enlarges the perspective to the pre-climate change context in the US Arctic. It successively focuses on the factors that triggered the

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<sup>10</sup> Some recent contributions on the impacts of climate change on US national security are the following: the comprehensive analysis on how climate change can affect the Department of Defense at all levels (Klare 2019), the application of securitization theory to US environmental security policy (Floyd 2010; Diez, Lucke, and Von Wellmann 2016), the development of an effective environmental communication strategy to end ideological disagreement on climate change, based on the military as trusted sources (Motta, Ralston and Spindel 2020), greenization (Snell 2017).

causal mechanism. Chapter IV focuses on the process through which the nexus climate change-homeland defense *has been identified* and formulated from its very beginning until the end of the Obama administration. Chapter V focuses on how the actors have managed climate change impacts in the Arctic under both Obama and Trump administrations.

The Conclusion, finally, is a *reflection* on the theoretical value of the research, including the enduring importance of geography for national security planning and the value that the research can also have for advisory purposes and policy-making.

# CHAPTER I

## Constants and Changes in Physical Geography according to International Relations

*“The public official who disdains geographically flavored arguments  
is a public official riding for a fall”  
(Gray 1991, 322)*

### 1. Introduction

Explaining states' behavior in its most comprehensive sense is beyond any doubt an unattainable goal because of the great number of explanatory factors that can be detected. This complexity is even aggravated by the fact that the academic discipline of International Relations (IR)<sup>11</sup> has adopted different focuses and perspectives depending on the domestic and international political context in which research was formulated (Andreatta *et al.* 2012, 18-19). By looking at IR literature, it emerges that behind observable outcomes in international politics, there are many explanatory factors modeled on multiple levels of

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<sup>11</sup> IR as a discipline has been granted formal autonomy from international law, international organization, diplomatic history and international economics (Baldwin 2016, 92), although it extensively draws on such multidisciplinary knowledge. The first chair in International Politics in the world was founded at the end of the First World War at the University College Wales, Aberystwyth in 1919, and it was dedicated to Woodrow Wilson. The spirit underpinning the foundation of the Department was indeed that of Idealism, so that Edward H. Carr, the fourth Woodrow Wilson Chair, left in 1947 because of the incompatibility of his ideas with those of the founder of the Chair (Andreatta *et al.* 2012, 42, 45; see also <https://www.aber.ac.uk/en/interpol/about/centenary/interpollegacy/timelineofevents/>).

The discipline has then reached the US. In the 1930s, the American discipline of “International Politics” was quite different from its British idealistic origins: in 1933 Frederick L. Schuman published his textbook “International Politics” (1933), and in the same year Nicholas J. Spykman presented his paper “Methods of Approach to the Study of International Relations” (1933) – both works were considerably concerned with *Realpolitik* and the absence of an international government. Two years later, the Institute of International Studies was founded at Yale University (Baldwin 2016, 92-94). Since then, enriched by perspectives and debates, IR has become a sort of “American mainstream” that endures until today (Andreatta *et al.* 2012, 39-40).

analysis. Explanatory factors, or *explanans*, can range from extreme parsimony, such as the international political system (Waltz 1979), to perspectives centered on the social construction of reality, such as ideas (Wendt 1999), culture (Katzenstein and Keohane 2006), institutions (Keohane 1989) but also psychology (De Rivera 1968), leader personality (Barber 1972; George 1969) and social group dynamics - ranging from small groups (Janis 1982) and organization models (Allison 1971) to more comprehensive bureaucratic politics (Halperin 1974). The list can also include the dynamics of domestic politics (Buono de Mesquita et al. 1992), the role of lobbies (Mearsheimer and Walt 2007), media, and public opinion (Herman 1993; Bennett and Paletz 1994), to mention a few. For analytical purposes, it is then useful to frame one or more explanatory factors into levels of analysis, as elegantly proposed by Waltz (1959) and later retrieved by others (for example, Hudson 2014, 34). Some studies have proven that also integrating different levels of analysis can be possible (Rosenau 1964; Brecher 1972).

It can be noted that mainstream IR usually forgets about explanatory explanans that were once prominent: geography. Geography is a key-factor that has always affected states' behavior: how states have waged war, for example, were explained or justified *also* on a geographic account. As noted by Colin S. Gray, whose attention towards historical patterns is remarkable, “[E]very conflict is shaped by its geographical setting and, with few exceptions, has the participants expressed war aims in terms of physical or political geography” (1991, 318). Thus, the influence of geography on conflict “is pervasive at all levels of analysis: policy, grand strategy, military strategy, tactics, and technological choices and performance” (Gray 1991, 320). *Some* “geographical” explanations, as much as they are fascinating, are to be carefully considered, however. On the one hand, in methodological terms, the operationalization of geography as *explanans* can result in deterministic positions both on the micro (the individual) and the macro-level (the community and beyond), sometimes flowing into generalizing normative conclusions which impose repeated outcomes with no space for human agency or worse, such as the achievement of some specific bio-conditions influencing human activity or deriving prejudice on some groups, as frequently stressed in the past by geopoliticians themselves (Bowman 1942; Weigert 1942; Strausz-Hupé 1942). On the other hand, contemporary critics point out how more “relaxed” operationalizations of the geo-element often end up being methodologically undefined and leading to poorly grounded conclusions (Fettweis 2015; Klin 2018).

Today the thesis of the *end of geography*, popular since the 1990s, has gained ground, indeed. The thesis claims that in some critical sectors (e.g., finance, international trade, culture), the deterritorialization of space due to the digital revolution and new communication technologies has brought the end of geography (O’ Brien 1990), consisting in the dismantling of borders and distance in a flat world (Friedman 2006). But, as this research sustains, it cannot be denied that geography still “matters” in national security. Moreover, today's relationship geography-national security is aggravated by a macro-phenomenon widely discussed in academia and beyond: the change in global physical geography that is taking place presumably since the 1950s (*abrupt climate change*).

The following chapter, centered on the importance of geography in national security in its broadest sense, starts with explaining how Realism and Classical Geopolitics stressed

the constant nature of geographic factors (par. 2), moving to the inclusion of environmental dynamics which have challenged this assumption (par. 3). It will then be highlighted how among environmental dynamics, climate change holds a unique position with respect to its effects on natural systems and challenges posed to high politics. For this reason, the major trends in IR literature on climate and climate change will be analyzed (par. 4), outlining, in the end, a notable gap in Realist literature (par. 5).

## 2. Constant geography: Classical Geopolitics and Realism

Classical Geopolitics<sup>12</sup> and Realism were the perspectives that addressed the relationship between geography and politics more than any other. Building on that corpus, in this research the concept of “geographic constants” (Haldén 2018, 4) will include factors such as topography, climate, and regional/world location that were commonly taken into consideration by the literature on the influence of physical geography on international politics<sup>13</sup>. Most importantly, it was their constant nature that made them particularly valuable for scholars (par. 2.1). Throughout this section, the most basic conceptualizations of physical geography in Classical Geopolitics and Realism will be then outlined, namely geographical constants *as power assets* (par. 2.2), *as drivers of foreign policy* (par 2.3), as well as how they have been applied to policy-making and advisory purposes (par. 2.4).

### 2.1 The constant nature of physical geography

As in Realism and Classical Geopolitics, one of the valuable aspects of the analysis based on geography was the merit of addressing *the most permanent factors* for the

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<sup>12</sup> As a discipline, Classical Geopolitics is made by the merging of History, Strategic Studies and Geography (Bordonaro 2012, 27): its distinctive features are unitary state perspective, the assumption of a globally closed space, and detailed geographical analysis. According to Federico Bordonaro (2012, 27), the main authors in Classical Geopolitics are Alfred Thayer Mahan (1840-1914), Friedrich Ratzel (1844-1904), Halford J. Mackinder (1861-1947), James Fairgrieve (1870-1953) and Nicholas J. Spykman (1893-1943); other, less known but still significant at least for the Anglo-saxon tradition, are Julian Corbett (1854-1922), Robert Strausz-Hupé (1903-2002), James Burnham (1905-1987), Isaiah Bowman (1878-1950), George Cressey (1896-1963).

<sup>13</sup> Topography, climate, and regional/world location are still an unavoidable simplification of the complexity of geographic factors presented by great part of the authors here taken into consideration.

formulation of foreign policy (Spykman 1938a, 29)<sup>14</sup>. According to Spykman, “because the geographic characteristics of states are relatively unchanging and unchangeable, the geographic demands of those states will remain the same for centuries” (Spykman 1938a, 29). Consequently, the most permanent factors that influence states’ foreign policy<sup>15</sup> are defined as the most fundamental ones (1938, 40)<sup>16</sup>. Mackinder doubted “whether the progressive desiccation of Asia and Africa, even if proved, has in historical times vitally altered the human environment” (1904, 437) because “social movements of all times have played around essentially the same physical features.” Indeed, he argued, “the geographical quantities in the calculation are more measurable and more nearly constant than the human” (1904, 437). In the 1990s, Gray wrote that “[A]s a limitation upon the power of states, nothing has proven to be more pervasive and *enduring* than geography”<sup>17</sup> (1996, 311) and that “[T]he prime virtue of geopolitics is that it does (...) direct attention to factors of enduring importance” (1977, 5).

In this regard, Harold and Margaret Sprout, two political scientists writing some years after Spykman, classified empirical phenomena into *constant* and *variables* (Sprout and Sprout 1960, 146). They specified that while “[I]t is probable that no empirical phenomena are absolutely constant through time” (1960, 146), geographical configurations (the layouts of lands and seas) varying in space

“are among the more stable factors of environment through time spans generally of interest to the political analyst. However, (...), even the most stable geographical configurations may be indirectly affected by changes in *the social factors*<sup>18</sup>. (...) The distribution of useful materials – water, soil, minerals, etc. – highly variable in space, tends in our age to be differentially variable among countries and region even through relatively

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<sup>14</sup> Spykman may be considered, indeed, one of the founding fathers of American Political Realism as well as a leading author of Classical Geopolitics (Stefanachi 2013). His background is indeed that of a political scientist, and not of a geographer or political theorist - the two categories of scholars that have been the most active in the debate on the valorization of environmental causality. For this reason, his studies are of particular importance, as they were able to create a dialogue between theory of conflict and political geography through a geopolitical analysis based on balance of power theory retrieved from Political Science (see especially Spykman 1942). They are indeed actual geostrategic works (Owens 2015, 472).

<sup>15</sup> Defined as “most conditioning factors” by Spykman (1938a, 29).

<sup>16</sup> Specifically, Spykman identified as conditioning factors world and regional location, internal area, and in-depth defense (1938a).

<sup>17</sup> Emphasis added.

<sup>18</sup> Emphasis added.

short time spans. Climate, too, varies in space and through time. Both climate and natural resources are subject, like geographical configurations, to changes in significance as the result of changes in the social factors of environment." (Sprout and Sprout 1960, 147).

The analogy with the stage (the earth) and drama (human activity) is indeed a recurrent one (Fairgrieve 1924, VI, 9; Sprout and Sprout 1960; Gray 1996, 257-258). While the stage background is relatively, if not totally, fixed, the drama is performed by actors - individuals, communities, states. In the 1960s, dramatic or abrupt changes in geographical facts were not taken into account; as the Sprouts wrote (1960, 153), "[W]ith reference to the non-human environment, change presents two facets: changes in the non-human factors themselves, and changes in social factors which in turn alter the political properties or meaning of relatively stable non-human factors." Possible changes in non-human factors derive

"from physical processes of nature: earth slipping, volcanoes erupting, rocks falling, water flowing and freezing, wind blowing, plants, animals, and micro-organisms reproducing, multiplying, or dying out, etc. Sometimes these 'natural' processes produce human catastrophes such as earthquakes, floods, famines, and epidemics; occasionally, such catastrophes have affected in some degree the patterns of international politics" (Sprout and Sprout 1960, 153).

But far more important were the changes brought by men, such as the increasing and destabilizing technological advances: those artificial changes were not altering "the basic structure of the earth's surface," but were giving "new meaning and values to such geographic features as location, distance, terrain, climate, and natural resources" (Sprout and Sprout 1960, 154):

"[T]he deserts, mountains, and prairies, the configuration of coast lines, and other physical dimensions of our planet remain substantially unchanged. What has changed radically, is the political and military value of these geographic facts – changes resulting in large measure from the revolutionary advances of modern engineering and technology" (Sprout and Sprout 1960, 155).

## **2.2 Geographic constants as power assets**

One conceptualization of geographic constants that emerges in Classical Geopolitics and Realism is that of geographic constants as power assets, as part of the debate on the elements of national power. It is indeed widely recognized that power is one of the basic concepts of IR, and so-called power assets (also called "power base" or "base values"; terms

are many and varied) are constituted by the resources on which power relations are based<sup>19</sup> (Baldwin 2016, 52). The bases of power can range from some specific typology of human capital to financial resources or from physical strength to the general ability to withstand losses (Schelling 1960, 22). Political analysis is also *contextual*, meaning that it is affected by contextual factors such as culture, social order, or technology (Lasswell and Kaplan 1950, 94), so a rigorous analysis should at least specify the scope and domain of a power resource (Baldwin 2016, 53). In this case, a specific emphasis on power for state *survival* may give rise to a conceptualization in terms of *capabilities* (Baldwin 2016), a definition that basically rejects the relational nature of power advanced by Robert A. Dahl (1957)<sup>20</sup>. This is precisely the case of Realism. The Realist perspective is rooted in the assumption of the absence of an international government, which constitutes a condition of anarchy, opposed to hierarchical domestic order. States' life under anarchy resembles that of the Hobbesian state of nature, where the prerequisite is survival. It follows that by its very nature, a focus on this aspect of IR may result in an analysis of power based on military standards.

Such a research agenda copes well with the standards of Classical geopolitical analysis. On the one hand, the attention devoted to the geographical elements of power assets by Realism meets Geopolitics' very essence, namely the analysis of the "geo" element. On the other, the analysis of geographical factors conditioning state behavior outlines an unequal distribution of power potential, leading to the acceptance of anarchy (and thus, war) as an unavoidable condition for states' relations. In this regard, in 1919, Halford Mackinder (1962 [1919], 1-2) wrote that:

"[T]he great wars of history (...) are the outcome, direct or indirect, of the unequal growth of nations, and that unequal growth is not wholly due to the greater genius and energy of some nations as compared with others; in large measure it is the result of the uneven distribution of fertility and strategical opportunity upon the face of the globe."

Gray then argues that "[T]he importance of geopolitics (...) lies precisely in the facts that it addresses a major dimension to international conflict, the geographical, and that it seeks to

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<sup>19</sup> The conceptualization of power proposed by Dahl intends power in relational terms between two actors, *A* and *B*: "A has power over *B* to the extent that he can get *B* to do something that *B* would not otherwise do" (1957, 202-203).

<sup>20</sup> Concerning Dahl's definition of power, Kenneth N. Waltz (1979, 191-192) wrote: "[T]o define "power" as "cause" confuses process with outcome. To identify power with control is to assert that only power is needed in order to get one's way. That is obviously false, else what would there be for political and military strategists to do? (...) To measure power by compliance rules unintended effects out of consideration, and that takes much of the politics out of politics."



identify and explain patterns in international conflict behaviour” (2004, 17)<sup>21</sup>. Therefore, it can be concluded that “[G]eopolitics is a variant of classical realism” (Gray 2004, 17).

In Realism and Classical Geopolitics, the expression “elements of national power,” quoted from Hans Morgenthau (1997 [1948], 197) and then retrieved for example by Valerie Hudson (2014), usually indicates the set of a state’s power assets for the attainment of its objectives – first of all, survival as a precondition to contextual objectives. In one of the most systematic attempts to explain states’ behavior, Morgenthau includes geographical location, natural resources, industrial capacity, military capabilities, demography, national character, and morale among his elements of national power (1997, 179), while, on his part, in one of his works Mearsheimer lists only size of the population and wealth (2014, 43) and Waltz (1979, 131) specifies that to be considered a great power a state must succeed in high ranking on *all* the scores he selects.

Since its very beginning, Realist literature has been full of definitions of the elements of national power, highlighting the geographical dimension of the state power, also indirectly (as it can be noted in Table 1.1)<sup>22</sup>. Geographic factors (among which topography, climate, regional or world location are the most recurrent, although there is no systematic “catalog”) are thus a sub-set of the broader set of material and immaterial “elements of power,” which are a recurring *leitmotif* not only in Classical Geopolitical literature but also in Realism. It should be stressed that a clear-cut distinction among the elements taken into consideration by the literature is impossible, and literature itself, as it can be noted, proposes overlapping elements. Nevertheless, it is *the very process of limiting the set of factors to geographic factors* that constitutes the main objective of Geopolitics, as pointed out for example by Harold Sprout: “[G]eopolitical speculation represents attempts to identify a limited number of factors, the uneven distribution of which in space (and, in some instances, variation through time as well) provides a plausible basis for explanation and prediction” (1963, 192). The different focuses and choices of scholars and analysts regarding the elements of national power indeed provide the very richness of geopolitical perspectives.

For example, Mackinder wrote that the growth of empires was generally due to the “the grouping of lands and seas, and of fertility and natural pathways (1919 [1962], 2). Indeed, the World Island was home to more “than fourteen-sixteenth of all humanity,” a fact that, in the opinion of the geographer, was very unlikely to change (1962, 68). On a global scale, he noted for example that it was the location of Australia, lying “a thousand miles from the southeastern point of Asia,” and measuring “only one sixty-fifth of the surface of the

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<sup>21</sup> Territorial rivalries and physical geography are usually considered as the essence of Geopolitics (Lacoste 2004, 13).

<sup>22</sup> For instance, it can be easily agreed that the wealth of a population depends on the resources functional at putting up “a serious fight in all-out conventional war against the most powerful state in the world” (Mearsheimer 2014, 5). In the “nuclear age”, the possibility of passive defense given by territorial area and granting dispersion is also a crucial element (Brodie 1959, 202-210).

globe” (1962, 64), that made the continent marginal in international politics, similarly to North and South America - all defined as satellites of the old continent (1962, 64). Spykman, on his part, pointed out the fact that throughout history, the “overwhelming majority” of major powers have been large states, like Egypt, Babylonia, Assyria, Persia, and Rome (1938a, 31): the larger the area, the greater the chances of having climatic ranges, a varying topography, and thus varied resources and economic possibilities underpinning state power (1938a, 32). Indeed, one of the main arguments advanced by the Dutch-American political scientist was exactly that the world's main political activity was located between 25° and 60° north latitude, where political and industrial world powers were located (Spykman 1938a, 42). More recently, Gray argued that the importance of China in the international scenario was due to reasons of geography, because of “size, character of territory, population, social habits, and location” (1996, 258).

**Table 1.1 Elements of national power according to the main authors of Classical Geopolitics and Realism.**

<b>Author</b>	<b>Elements of national power</b>
Alfred T. Mahan	Geographical position; physical conformation (natural production and climate); extent of territory; size of population; character of the people; character of the government and national institutions.
Halford J. Mackinder	Geographical conditions (economic and strategic); relative number of the population, virility, equipment, and organization; topography; natural resources.
James Fairgrieve	Topography; location; climate; population; sources of energy: heat, light, radiation, distribution of air, air-currents.
Robert Strausz-Hupé	Size; kernel area; system of communication; defense in depth; self-sufficiency in raw material; productive capacity.
Nicholas J. Spykman	World and regional location; size; resources; population density; economic structure; ethnic composition; form of government; prejudices of foreign ministers; distribution of the territory and power of other countries.
Hans Morgenthau	Geographical location; natural resources; industrial capacity; military capabilities; demography; national character; morale.
Kenneth N. Waltz	Size of population; size of the territory; resource endowment; economic capability; military strength; political stability; political competence.
John J. Mearsheimer	Size of the population and its wealth.
Colin S. Gray	Size; character of territory; population; social habits; location.

Source: Mahan (1890, 28-29), Mackinder (1904; 1943), Fairgrieve (1924), Strausz-Hupé (1972 [1942], 181-191), Spykman (1938a, 28; 1938b; 1944), Morgenthau (1997 [1948], 97), Waltz (1979, 131), Mearsheimer (2014, 43); Gray (1991, 313; 1996, 258).

Geopolitical analysis should not be reduced to a simple count of capabilities, however. On the contrary, Classical Geopolitics devotes space also to the analysis of *potential* power. While the discourse may seem marginal in the overall agenda, the importance given to the analysis of potential power is still remarkable. According to Mackinder (1904, 437), socio-economic features are the main factors constituting Russia and China's potential power. It is exactly the fear posed by the power potential of some states that fosters geopolitical analysis. This is particularly evident in the broad debate over the *possible* unification of “the whole Eurasian land mass” (Spykman 1944, 34) feared or wished by Classical Geopolitics and its successors (for example, Gray 1977; Brzezinski 1997), still at the center of US foreign policy and geostrategy.

### 2.3 Geographic constants as drivers of human behavior

From a different perspective, geographic factors have been conceptualized as *drivers of human behavior*<sup>23</sup>. The relation between geographic constants and human behavior is a causal one, and it can be assessed according to several degrees of causality (environmental causality)<sup>24</sup>. To be considered a *driver*, the author must thus assess a specific causal nexus between geographical constants and outcomes. However, this does not exclude a previous analysis of power potential deriving from the same or other geographical factors: in some cases, the concept of “driver” can include an analysis on potential/actual power, while in others, this may not be relevant. As it will be briefly anticipated here, both conceptualizations of geographic constants (power assets and drivers) are considered in geostrategic planning, a practice consisting of the allocation of material and immaterial resources to manage national threats and interests identified based on geopolitical analysis<sup>25</sup>.

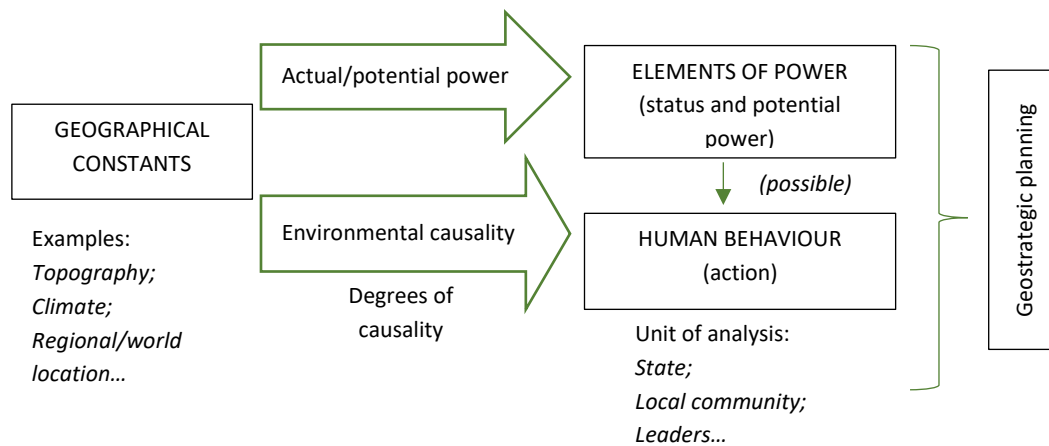
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<sup>23</sup> Please note that the specific case of climate will be addressed from par. 4.1 onwards.

<sup>24</sup> The most extreme position is that of *environmental determinism*, which “postulates that all human behavior is determined by reference to limits set by the hereditary characters and by the milieu of the individual under consideration” (Sprout and Sprout 1965, 48). In general, deterministic works are considered those of Friedrich Ratzel, Karl Haushofer and Ellen Churchill Semple. However, this a questionable classification. There are several degrees of determinism, according to the Sprouts (1965, 49-50), ranging from a *loose teleological impressionism*, to stronger correlations also expressed in statistical terms with large aggregates of events, going from *statistical regularity* to *absolute predictability* (1965, 66). A more correct classification, from total constraint to total freedom, may be expressed in terms of: Determinism, Probabilism, and Possibilism.

<sup>25</sup> On geostrategic planning please see par. 2.3.

**Figure 1.1 The double conceptualization of geographical factors in Realism and Classical Geopolitics.**



Source: own elaboration

Among main authors, James Fairgrieve (1924, 9, 21) based his analysis on the geographical conditions *controlling [sic]* the course of history: according to this perspective, the establishment of the Electors in Germany was one of the results of the impossible creation of a national authority due to “tendencies to disruption, partially geographical, partially historical” (1924, 207), such as the absence of a definite center, the encirclement by powerful peoples, and cold climate dominating in northern regions (1924, 203). Indeed, because of the absence of a natural center in Germany, “the emperors were not forced, as the English kings, to rule from a particular centre” (1924, 208); also, the persistence of the feudal system was due to the “geographical facts” characterizing Germany (1924, 208). Moving to a broader theoretical perspective, Fairgrieve elaborated a theory based on the struggle for sources of energy, driving pastoral societies to better grazing grounds, Rome to Egypt’s agricultural fields, Britain to coal mines (Robert Strausz-Hupé 1972, 178). By adopting a similar logic, Mackinder explained historical outcomes such as the foundation of the Anglo-Saxon kingdoms, the founding of Vienna and Aquileia, and the sieges of Vienna as reactions of European peoples escaping from Asian hordes. Those latter were invading Europe thanks to the existence of an “impeded plain” (Mackinder 1904, 427) and forced passages (namely, the corridor of steppes in Ukraine, in the southern part of Western Russia north of the Black sea). Also, a state’s “grand-strategic alternatives” (Gray 1991, 312) are identified on the basis of some geographical conditions. For example, in Britain’s case, the alternatives pointed out by Gray were selected according to its insular position (1991, 312).

## 2.4 Geographic constants for problem-solving

On the basis of geopolitical analysis, the mapping of threats and interests for contextual strategic planning can also be pursued for problem-solving, as a technocratic issue (Agnew 2003, 30-31), or, in other words, according to the framework of practical geopolitics (Ó Tuathail 1996, 60). Indeed, it is through the problem-solving perspective, carried out by

élites, that Geopolitics has survived more as a practice than as a discipline (Agnew 2003, 37), and it was precisely the constant nature of geography that made geopolitical analysis a valid instrument for policymaking. Moreover, since “the geographical setting for international political analysis” embraces all aspects of human activity - economics, politics, strategy – one can speak of a plurality of relations between human activity and geography: for example, geoeconomics, geopolitics, and geostrategy (Gray 1996, 247).

The inclusion of geography in geostrategy leads to the problem of the operationalization of geographical factors, a necessary step for the analysis of their fungibility for practical purposes. The operationalization of geography posed challenges already in Classical Geopolitics (Spykman 1942b): “[G]eographers have attempted to set up yardsticks for measuring actual and potential power relations, but none have received wide acceptance,” noted Spykman with regard to the setting of the New World Order after World War II (1942b, 436, 445). By restricting the policy-contingency framework to state survival in anarchy, which makes the geographical area<sup>26</sup> of a state *the base from which it moves to war* (Spykman 1938a, 29), the relevant geographical factors can be quantified (Mackinder 1904, 437, and inferences derived from them can be generalized.

One of the clearest voices in this regard was still that of Mackinder, who delivered in 1887 a speech at the Royal Geographical Society valid for the construction of a geopolitical analysis based on the assessment of causal relations between physical geography and human activity. The result is *political geography*, or in Mackinder’s own words, *rational geography*:

“[W]e hold that *no rational* political geography can exist which is not built upon and subsequent to physical geography. At the present moment we are suffering under the effects of an irrational political geography, one, that is, whose main function is not to trace causal relations, and which must therefore remain a body of isolated data to be committed to memory” (Mackinder 1887, 143).

The approach consists thus, as a first step, in the collection of empirical data, mostly physical geographic data. In this way, once translated into empirical data, the elements of national power can be operationalized through quantification, no matter (for the moment) how systematic or rigorous. The next step would be to infer an explanation from the description constituted by the collection of the data and their analysis. On this basis, the researcher can propose explanations for historical outcomes, and eventually, enrich their meaning through the generalization of her conclusions. Finally, the analyst explains complex patterns by applying a “structural” theory, such as the superiority of continental or naval power (Mahan 1890; Mackinder 1919).

Geopolitics following the rational geography method is defined according to its most usual definition as “the analysis of the interaction between, on the one hand, geographical

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<sup>26</sup> According to its three-dimensional space (Bettoni 2004).

settings and perspectives and, on the other hand, political processes” (Cohen 2003, 12). However, since the end of World War II and the advent of Neorealism, inquiry on the causal relationship between physical geography and politics has been neglected in IR literature and has progressively disappeared even in Geopolitics itself<sup>27</sup> (except for the so-called Neoclassical Geopolitics). According to this perspective, strategic planning is based on strategies (and/or policies) formulated on the basis of the political implications derived from the identified geopolitical “pivot.” “Pivot” is a term borrowed from Mackinder’s work (1904) and later formalized by Brzezinski<sup>28</sup>, according to whom “[G]eopolitical pivots are the states whose importance is derived not from their power and motivation but rather from their sensitive location and from the consequences of their potentially vulnerable condition for the behavior of geostrategic players” (1997, 41). Usually, they are states, but in some analyses more strictly rooted in geography, a territory sharing some specific geophysical configurations can be a pivot.

The most notable cases are the advisory and/or academic works by Mackinder (1919; 1943), Spykman (1942; 1944), Kennan (1947), Brzezinski (1997; 2012), Cohen (2003), the overall containment strategy of the Cold War (Gray 1977; Gaddis 1982; Sloan 1988; Leffler 1984) and beyond (Stefanachi 2017), and in recent years, the “Pivot to Asia” strategy proposed by Hillary Clinton (2011). In most cases, analysis is based on a loose quantification of power assets enriched with personal opinions and impressions and sometimes also through scenario planning logic<sup>29</sup>, even if not formalized. According to the theory of the pivotal role of Eurasia, the US “could not exist as a functioning, unruly democracy were the Rimlands [*sic*] of Eurasia-Africa to be organized into a Soviet security system” (1977, 57-58). Despite its insularity, the weakening of the strong interdependence between the US and international trade might lead to a condition where the physical survival of the US is ensured, but its social and political institutions gradually transform into a garrison state, or an “illiberal fortress practices” (Gray 1977, 58). On this basis, Gray advises US national security planners not to lower their guard and not to fall into the trap of strategic parity (1977, 61). Similarly, Brzezinski embraced the idea of a pivotal Eurasia (but without direct mention to Mackinder or Spykman) and the necessity of the establishment of a balance of power in East Asia (1997, 185): in doing so, Brzezinski analyzes data such as GDP, demographic growth, military power,

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<sup>27</sup> As a discipline, since the 1990s Geopolitics has relied mostly on post-modern approaches, such as Critical Geopolitics, and methods suitable for the analysis of discourses and images which, however, consist essentially in the application of discourse analysis. They do not formulate political-strategical hypotheses on international politics (Bordonaro 2012, 184).

<sup>28</sup> Zbigniew Brzezinski (1928-2017) was not only an American diplomat (counselor to President Johnson and later National Security Advisor for Carter) but also one of the main authors of the Anglo-Saxon geopolitical tradition (Bordonaro 2012).

<sup>29</sup> On scenario planning please see for example Schwartz (1996) and Lindgren and Bandhold (2009).

and the social gap deriving from the distribution of wealth in the case of China. More recently (2012), Brzezinski supported the idea of making China a partner for preserving/containing the equilibrium in the Eastern part of Eurasia, succeeding the US, already in decline on several domestic fronts (2012, 46-55).

### **3. Changing geography: literature on *environmental dynamics***

A variation in literature occurred after World War II, with the fading of Classical Geopolitics - if not in geostrategic planning as a practice, at least in academia. In the 1960s, the Sprouts noted that the language of international politics was already filled with terms such as setting, stage, arena, environment, or milieu and that all of them attested “the pervasiveness of modes of speaking that link political behavior and patterns of interaction with encompassing conditions and events” (1962, 6). This shift in the literature created a sort of a benchmark in geopolitical studies and IR, which switched their focus from physical-environmental geography in favor of more human-psychological aspects. This paragraph will outline the major literature trends which preserved some connection to non-human factors affecting national security. For this reason, the review will be restricted to the so-called *environmental security*<sup>30</sup>, with a focus on a fundamental component: the nexus between the non-human environment and state survival (sometimes, the nexus has been extended to the entire state system).

What will emerge from the literature is that both changes in geography and scientific advancement have led to a different conceptualization of physical geography. Progressively, geographical features have been conceived in relation to *other* non-human or human factors, according to *complex relations* that here are called “environmental dynamics” (par. 3.1). In environmental security literature, environmental dynamics have been included in the following major trends: the inclusion of the environment itself in the security agenda (par. 3.2), the debate on the consequences of overpopulation on state security (par. 3.3), and the nexus between environmental issues and conflict (par. 3.4).

#### **3.1 Environmental dynamics**

In contemporary literature, the term “environment” indicates a great variety of concepts. By staying to one of the definitions elaborated at the fading of Classical Geopolitics, the environment was conceptualized by the Sprout as “all phenomena in space and time which are external to the unit under consideration and to which that unit’s activities or status may be significantly related” (1960, 146). It can be easily agreed that the environment, in this conceptualization, is made of two typologies of factors: *human factors* and *non-human factors* - this latter sometimes called “physical environment” or “natural environment”

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<sup>30</sup> As broad discipline, environmental security is centered on the relationships between natural systems and national security (at all levels and according to various conceptualizations as well).

(Sprout 1960, 146). Non-human factors today are undergoing changes that have not been addressed by Realism and Classical Geopolitics, either because those changes were inexistent or marginal in the political and historical context. In the absence of a solid analytical framework for practical purposes such as that addressed in par. 2.3, those changes pose a severe challenge also in terms of national security planning.

Literature is full of terms indicating the changes that the “environment” is undergoing. However, there is no consensus on the very terms that should be used to underline how IR still needs more grounded theoretical frameworks with respect to environmental problems. The terms used range from “climatological changes,” “anomalies,” “fluctuations,” “climatic variables” (Hsiang and Burke 2014), to “environmental changes” (Bernauer *et al.* 2012), “global environmental change” (Vogler 1996; Young 2002b), and “environmental problems” (Haas *et al.* 1993). What those terms have in common is the concept of *a dynamic environment*, be it endangered, worth of protection, or rich in opportunities.

**Table 1.2. Some possible environmental dynamics as addressed by literature.**

<i>[Population growth</i>	<i>Ehrlich (1968)]</i> <sup>31</sup>
Environmental scarcity	Homer-Dixon (1991)
Environmental degradation	Carson (1962)
Resource depletion	Simon (1990)
Global warming	Vogler (1996)
Ozone depletion	Levy (1995)
Natural disasters	Ullman (1983)
Deforestation	Mathews (1991)

Source: own elaboration based on quoted works.

Those dynamics (here reported in Table 1.2) may be both quantitative or qualitative in the broadest sense. They sometimes consist in complex interrelations of “smaller changes,” such as the *increase/decrease of some elements* (the reduction in the number of trees in a forest, the lowering of ozone levels in the atmosphere, or the rise in the population growth rate<sup>32</sup>) or a shift *from abundance to scarcity* (natural resources, for example), the

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<sup>31</sup> On the inclusion of overpopulation, please see note no. 29.

<sup>32</sup> Overpopulation, as it will be seen later, is one of the most recurring topics in the first studies on the environment. It can be easily noted that overpopulation is not a change in physical geography, but a change in the very human dimension. However, since the nexus population growth-environment represented a crucial issue for the development of environmental studies (including studies on state survival) here it will be included as environmental dynamics only on the basis of this fundamental premise.



*degradation of the quality of some factors (ecosystems), or a change in geographical layouts* (climate change, extreme weather events or more general natural disasters). Sometimes the consequences of those changes are embedded in more encompassing changes (for example, climate change). While it is not our purpose here to delve into the “unpacking” of environmental dynamics – a task most appropriate for “hard” science scientists - it is enough here to note that introducing the concept of environmental dynamics may be *a useful tool* for pointing out the conceptual differences between those complex non-human or/and human relations and the geographic constants outlined in par 2.

The following paragraphs will briefly present how IR has included environmental dynamics into the discipline. The most similar concept to environmental dynamics is probably that of “environmental changes” (Bernauer *et al.* 2012), an umbrella term including “temperature increases, changes in precipitation levels and patterns, rising sea levels and intensification of natural hazards, such as storms, floods, droughts and landslides” (2012, 1). The expression is used by Bernauer *et al.*, referring specifically to anthropogenic changes based on scientific findings. Still, as far as their analysis is valuable in assessing the influence of environmental changes on various types of conflict, the expression is limited to a simple umbrella-term pointing out “a problem.” Here, environmental dynamics are the major challenge posed to national security (as far as physical geography is concerned) since the acknowledgment of their existence.

### **3.2 The inclusion of the environment into the security agenda**

The inclusion itself of the environment and environmental dynamics into the national security agenda paved the way for a rich conceptual debate among those authors that were defined as *the first generation* of environmental security (Rønnfeldt 1997). The conceptual debate originated in the 1980s, at first calling for the inclusion of environmental factors into the concept of “security” (par. 3.2.1). It merged later into the debate over securitization, which took place mostly in the 1990s, whose value provided an empirical insight for the analysis of so-called non-conventional threats (par. 3.2.2).

#### **3.2.1 The conceptual debate**

The debate held by the first generation (Rønnfeldt 1997) revolved around a fundamental conceptual issue – the definition of security itself. Literature was mostly addressed to developed states, aiming at the stimulation of different definitions of national security and policies (Mathews 1989, 174). This debate, taking place within security studies at the fading of the Cold War, represented a response to the sustainers of the traditional concept of *security*, criticized for being too narrow and conservative, and thus accused of totally excluding critical phenomena taking place in the real world. It aimed to incorporate neglected or emerging issues into a concept of “security” stretching beyond traditional threats.

In this framework, a sub-set of the general concept of “threat” to security is constituted by environmental threats, different from traditional threats from an analytical point of view (Deudney 1990, 461). The conceptual debate on the inclusion of environmental

threats into security stimulated not only the academia since the inclusion of new issues into security inspired totally new research focus in security studies, but also politics, since the process of addressing policy-makers and civilians through the presentation of a more “real” image of reality, far from the typical *Realpolitik* schemes, was thought to have a positive impact on the creation and re-creation of institutions themselves. Indeed, according to Hugh Dyer,

“[T]raditional security discourse is not well equipped to address the pressing global issues that a (new) definition of security must cope with. A continuing dependence on the troubled concepts of sovereignty, national interest and (state) foreign policy, which have historically provided the framework and rationale for military threats and actions, suggests that the notion of ‘security’ does not lend itself well to the project of conceptualising a response to emerging global changes – not least global environmental change” (Dyer 1996, 23).

Security studies, thus, underwent a period of internal debate. Literature looked for a full redefinition of national threats, pointing at the formal recognition of “non-conventional” threats (Brown 1977; Ullmann 1983; Matthews 1989; Myers 1989). The most comprehensive definition of security was proposed by Richard Ullmann, professor of International Affairs at Princeton University, in his well-known “Redefining Security” (1983). With respect to environmental factors, Ullmann’s security includes both violent conflicts due to resource scarcity, environmental degradation, and population growth affecting demand for resources. According to Ullmann, a definition of national security in military terms entails a “profoundly false image of reality” and contributes to “a pervasive militarization of international relations that in the long run can only increase global insecurity” (1983, 129). On the contrary, national security should be defined in such terms to include all threats<sup>33</sup> that may negatively affect the quality of life of the inhabitants of the state (1983, 133). From this perspective, anything that may affect the quality of life, from military threats to various other events, *can* be a threat: for example, the interruption in the flow of critically needed resources, terrorist attacks, urban conflict, massive migration flows, and also environmental factors such as drastic deterioration of environmental quality caused by sources from either within or outside a territorial state (1983, 134-135), direct and indirect conflicts over resources due to growing demands and precarious supply (1983, 139-140). On her part, Jessica Tuchman

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<sup>33</sup> A threat to national security, according to Ullman (1983, 133) should be defined as “an action or sequence of events that (1) threatens drastically and over a relatively brief span of time to degrade the quality of life for the inhabitants of a state, or (2) threatens significantly to narrow the range of policy choices available to the government of a state or to private, nongovernmental actors (persons, groups, corporations) within the state”.

Mathews (1989) advocated the inclusion of environmental factors<sup>34</sup> into national security and questioned the planet's limited support of the increasing demand constituted by population growth as "at the core of most environmental trends" (1989). Similar is the position of Norman Myers (1989).

*A posteriori*, the definitions of security provided by the first generation are sometimes considered too broad to be considered a security issue since they stretch the concept of security beyond its intellectual coherence given by war and organized violence (Walt 1991, 213). Other flaws are identified in its being too broad to be feasible (Levy 1995, 40) and in needing a more rigorous operationalization to be feasible (Græger 1996). In particular, the inclusion of the deterioration of human well-being, as far as ethically valuable, means including into the security agenda an element that is subjective and whose significance changes over time and contexts. However, it must be considered that the debate on the broadening of security was mostly aimed at the conquest of a broad public and the stimulation of academic discussion rather than at the practical applicability for research purposes. In contrast to critics that outline that "engaging in this conceptual debate does not in itself contribute alternative strategies for improving the field of empirical research" (Rønnefeldt 1997), it may be argued that this was not the real objective of the authors of the first generation. Karin Dokkend and Nina Graeger (1995) suggested that those studies were probably intended more as 'political slogans' rather than 'analytical tools'. They proved extremely useful in stimulating political and academic attention towards environmental issues, which were progressively included in major defense documents in the years when the first generation flourished<sup>35</sup>.

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<sup>34</sup> "Global changes currently taking place in the chemical composition of the atmosphere, in the genetic diversity of species inhabiting the planet, and in the cycling of vital chemicals through the oceans, atmosphere, biosphere and geosphere, are unprecedented in both their pace and scale. If left unchecked, the consequences will be profound and, unlike familiar types of local damage, irreversible" argues Mathews (1989, 163), including the disappearance of genetic diversity, soil degradation, and patterns of land tenure as environmental factors (1989, 165-166).

<sup>35</sup> The first generation of environmental security was not directly concerned with the understanding of environmental dynamics in their social and political effects, however. On the contrary, the perspectives were focused on the inclusion of environmental dynamics, usually conceptualized as general "environmental issues" or "problems" constituting a hot topic in a worldwide debate, into the security agenda of governments.

### 3.2.2 The empirical turn: the securitization of environmental issues

Far from being a flaw, the “subjectivity” of the concept of security<sup>36</sup> proposed by the first generation became later the core of the debate on securitization by the Copenhagen School, whose main objective was to provide new security frameworks of analysis (Buzan *et al.* 1998). The main point in securitization is that security is an act of speech<sup>37</sup>. It results that even societal phenomena can be “securitized” since there are no “objective” threats in the empirical world. Accordingly, any issue included in security by the first generation (and beyond) may be defined as a threat *under some conditions*. Indeed, it is the political community that constructs security issues through a performative speech act. *How* actors manage this is a relatively complex process, and it may happen through different outlines (Trombetta 2008). The speech act is only the starting point (securitizing move), and securitization is complete when a targeted audience accepts the speech act. Finally, the issue is given the attributes typical of emergency politics entailing “extraordinary defensive moves” (Buzan *et al.* 1998, 204).

On this basis, an analysis based on securitization theory *aims to reconstruct whether the process has been accomplished, the actors involved in the process, and the conditions that made possible the outcome*. From an empirical perspective, the researcher should analyze the elite speech acts that define the issue as an existential threat and justify extraordinary measures to handle it and the signs of acceptance by the audience. If the issue ends by being managed through ordinary politics, this is proof of the failure of securitization (Wæver 1995, 29). If it enters into the realm of emergency politics, securitization has been successfully concluded. This framework can be applied to environment-related issues, according to the “founder” of the Copenhagen School - Barry Buzan, Ole Wæver, and Jaap De Wilde (1998, 71-72). According to them, the environmental discourse has been shaped by both a scientific and a political agenda. While the first is developed outside the government (through scientists and research institutions), the latter comprises governmental and intergovernmental actors. It is the political agenda that securitizes the environment, while the task the scientific agenda performs is providing information to political actors for threat assessment. While the scientific agenda follows academic standards, the political agenda follows its own political logic, shaped by short-term events as well as media and public standards (1998, 73). Actors involved are identified at the low-politics level and especially at the international level (Buzan *et al.* 1998). The categories of environmental threats can be identified in three relationships (1998, 79-80): threats not caused by human activities (e.g.,

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<sup>36</sup> Security is, according to Buzan *et al.* (1998, 24) “a self-referential practice, because it is in this practice that the issues becomes a security issue – not necessarily because a real existential threat exists but because the issue is presented as such a threat”.

<sup>37</sup> In the first formulation provided by Wæver (1995, 55), “[B]y uttering ‘security’, a state-representative moves a particular development into a specific area, and thereby claims a special right to use whatever means are necessary to block it”.

earthquakes, volcanic events), threats caused by human activity (e.g., greenhouse emissions, ozone depletion, environmental exploitation), threats caused by human activities which do not seem to pose existential threats (e.g., depletion of some mineral resources). According to the authors, it is the second category that undergoes a significant securitization process. Detecting the successful outcome of securitization is a complex task, however. Usually, environmental issues are securitized by political communities along a low-politics path, and they do not transform into highly detectable measures of urgency: differently from other issues (notably terrorism), they usually remain in the political domain (Floyd 2010; Trombetta 2008; Detraz and Betsill 2009; Corry 2012; McDonald 2013).

It should be noted that the successful securitization of an issue, which ends by being framed within the traditional security agenda, is usually considered harmful or morally wrong (Floyd 2010) by many authors (Barnett 2001; Dalby 1992; Deudney 1990, 1991). Indeed, the implications of the “normalization” of non-conventional issues into traditional emergency politics foster national security logic's typical violence (Floyd 2008). From this perspective, a *failed* securitization resulting in politicization (the national political agenda)<sup>38</sup> may be a better solution to the problem at stake in a democratic system. Works investigating the possible securitization of climate change in different case-studies are that of Trombetta (2008), Floyd (2010), Youngs (2015), Peters and Mayhew (2016), Diez, Lucke, and Wellmann (2016), Warner and Boas (2019). Correlated to this, also securitization of disasters related to climate changes has been studied (Peters 2018).

### **3.3 The legacy of Malthus: debating the consequences of overpopulation on primary resources and human well-being**

Moving to empirical studies, the very first conceptualization of the environment about significant state security implications revolved around the relationship between declining resources and growing population, a debate entirely derived from the Malthusian theory. In Neo-Malthusian literature, indeed, the nexus between environmental dynamics and state survival reaches even dramatic levels. According to some Neo-Malthusian literature<sup>39</sup>, ecological systems are naturally limited, and once the threshold is achieved, individuals cannot so adapt. The consequences over national security were immense, resembling those of nuclear annihilation. Perkins (1997) calls it the “population-national security theory.”

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<sup>38</sup> *Depoliticization* is the removal of the issue from the national political agenda - excluding actors such as NGOs, the academia, the political opposition (Floyd 2010, 58).

<sup>39</sup> Namely, Ecological Neo-Malthusianism. The economic branch of Neo-Malthusianism is called “Political Neo-Malthusianism” by John H. Perkins (1997, 121). Both Political and Ecological Neo-Malthusianism do regard national security (Perkins 1997, 121), but, the Ecological version deals strictly with the dramatic consequences of overpopulation on the geographic factors in a more direct way.

The central concept advanced by Thomas Malthus, an English clergyman (1766-1834) who devoted his life to the study of demography and economics<sup>40</sup>, is that of *resource scarcity*. In the well-known “Essay on the Principle of Population” (1798), Malthus studied the effects of food shortage on increasingly growing state populations, stating that the “power of population” is a “power of superior order” with respect to the virtually unlimited power of food resources of the earth (Malthus [1798] 1986, 6). Put in other words, food production grows arithmetically (at a linear rate) while population grows exponentially (at a geometric rate). In case of uncontrolled population growth, this law results in disrupting social and political consequences, as overpopulated and less resilient countries may undergo severe crises and wars as consequences of famine. The only solution is to keep down the population to the level of the means of subsistence ([1798] 1986, 6) through the application of some checks to the population (preventive or positive) to lower the birth rate or to raise the death rate ([1798] 1986, 8) until reaching a sustainable level of distress. Two antithetical trends derived from Malthusianism in the 1960-70s: Neo-Malthusianism and Cornucopianism.

The very first wave of Neo-Malthusianism was launched by the early works of Edward East (1923), Henry Osborn (1948; 1953), and William Vogt (1948), until environmental activism broke out in the 1960s, promoting thus political and academic debate on the relation between environment and politics/society. As in Malthus, the 1960-70s Neo-Malthusians (Ehrlich 1968; Hardin 1968; Falk 1972; Meadows *et al.* 1972; Barney 1980; Ehrlich and Holdren 1988) claimed dramatic consequences in terms of progressive environmental degradation, catastrophic famine, and war, following Malthus’ caveat on the effects that an uncontrolled population growth exceeding the possibility of food production can have on general wellness. Overpopulation is thus the issue from which environmental catastrophe is nourished:

“[T]oo many cars, too many factories, too much detergent, too much pesticide, multiplying controls, inadequate sewage treatment plants, too little water, too much carbon dioxide – all can be traced easily to *too many people*”

wrote Paul Ehrlich, a Stanford biologist and leading voice of Neo-Malthusianism (1968, 66-67).

Following Malthus, Neo-Malthusians made the advocacy for population control policies an essential part of their work to prevent the rise of those scenarios. Population control is thus a recurrent and almost obsessing argument in Neo-Malthusian literature. The blast of the “population bomb” in developing (and also developed) countries and the ultimate impossibility of achieving substantial increases in food production through

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<sup>40</sup> Malthus was also one of the first members of the Royal Statistical Society (1834).

technology<sup>41</sup> (Hardin 1968) could have been solved only by the application of checks on population (Ehrlich 1968, 95-109). Another fundamental peculiarity of the Neo-Malthusian perspective and research agenda was the application of *scenario making* as a fundamental step for advancing argumentations (usually apocalyptic futures, as in Ehrlich and Meadows 1988). For example, Ehrlich made three scenarios for fifteen years. In the end, he envisaged two solutions: either death by starvation or a maturity family planning policy to be carried out in the developed countries - first of all, the US as a good model for developing countries (1968, 80, 158). Richard Falk (1972, 415-437) presents two scenarios: a *status quo* scenario which ends with the annihilation of humankind, and another scenario, starting with the overcoming of the sovereign state as an institution and ending with an era of world harmony

These first works on the environment have in common the long-term perspective, to the point of being somehow apocalyptic and academically inaccurate, usually targeted at the stimulation of broad public debate<sup>42</sup>. For example, Osborn's works were part of the "educative" program sponsored by the Conservation Foundation, which he has directed since the 1940s. The works of the 1960s' wave were also heavily criticized on a methodological basis (Piper 1975; Perkins 1997) because of the insufficient attention to the transparency of data, the construction of scenarios, and the unpacking of causal mechanisms: in general, Neo-Malthusian arguments were judged as non-testable and non-replicable. A more rigorous work was the well-known "The Limits to Growth" by Donella Meadows *et al.* (1972). The report presented simulation models for the future displaying factors that may influence the growth and the maintenance of the industry and population, interactively through feedback loops and interrelationships (1972, 88-89); critics, however, underlined the fact that it did not include variation in prices in the simulations (Brander 2007, 7). However, the point itself of taking into consideration several variables and their interrelations - for example, population, cultivated land, agricultural capital, pollution, and industrial capital for the final goal of achieving a "World Model" (Meadows *et al.* 1972, 97) - laid the basis for advanced ecological modeling based on big data processing, later developed<sup>43</sup>.

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<sup>41</sup> As concisely argued by Garrett Hardin, commons (natural resources shared by a plurality of people: e.g., farmland, pastures, fisheries) are justifiable "only under conditions of low-population density" (1981, 1248). The problem given by population growth is unsolvable through technological innovation, as "[A] finite world can support only a finite population", namely a population growth equal to zero (1981, 1243) and not prone to overexploit the commons for self-interest. The problem is aggravated then by other factors, such as welfare states and morality protecting the current political and moral *status quo*.

<sup>42</sup> For example, Osborn's works were part of the "educative" program sponsored by the Conservation Foundation, which he directed since the 1940s. Osborn was one of the main financiers of the International Planned Parenthood Fund (Osborn 2009, 470). Vogt directed the Planned Parenthood Federation of American, and later became the secretary of the Conservation Foundation in 1964.

<sup>43</sup> The academic journal *Ecological Modelling*, for example, was founded in 1975.

Contrary to Neo-Malthusians, Cornucopians sustain the power of *human adaptability* even in case of resource scarcity and food shortage. The extremist position of the economist Julian L. Simon (1981; 1996) holds that the supply of natural resources is virtually infinite; he devotes then part of his study to the discussion of the concept of “limit” and the possibility of exploiting resources in outer space (1996, 65). If resources are infinite, this is possible thanks to technology, which multiplies services derived from resources (1996). For Cornucopians, technology is indeed a fundamental variable: some research sustains even the positive effects of population growth on technological advances (Boserup 1965; 1981). The falsification of Neo-Malthusians arguments relies mostly on testing hypotheses at the empirical level through a careful application of economics, for example, by measuring resource scarcity and analyzing its actual implications in terms of prices (Barnett and Morse 1963; Barnett 1979). The high level of *adaptation* typical of humankind makes it possible to overcome the finite nature of resources which was claimed by Neo-Malthusians, mostly through market mechanisms and technological innovations (Boserup 1981; Simon 1981)<sup>44</sup>.

In the 1990s, the debate between the second wave of Neo-Malthusians (Myers 1993; Renner 1996; Ehrlich and Ehrlich 1996) and Cornucopians experienced a revival. The year 2000 finally made it possible to test the conclusions of the “manifestoes” of the two perspectives and assess which of them was closer to reality. In 2005, for example, Henrik Urdal dismissed Neo-Malthusianism alarmism on a quantitative basis, assessing that the interaction between population growth and density is positive and significant only some decades, in particular in the 1965-1980 period, when Neo-Malthusianism exploded (2005, 430), but it is negative after the Cold War (2005). Timeframes are later specified by James Brander (2007) on the basis of “cycles” of abundance and deprivation (2007, 5). In 2005, then, Jonathan Chenoweth and Eran Feitelson tested the long-term predictions made by the Neo-Malthusian manifesto “Global 2000 Report to the President” (Barney 1980) and the Cornucopian “The Resourceful Earth” (Simon and Kahn 1984), both written in the 1980s and forecasting to the year 2000. The study concluded that “as a whole *The Resourceful Earth* was more accurate than *Global 2000*” (2005, 69), and the authors conclude that, since “[E]mpirically it can be seen that there is great variation in adaptive capacity between countries and regions, and over time” (2005, 70). More recent Neo-Malthusian works (Brown *et al.* 1991; Meadows *et al.* 1992) rely on data deriving from progress in technology (e.g., renewables resources) and focus on the achievement of sustainability goals<sup>45</sup>. Some authors

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<sup>44</sup> Sometimes, the greatest innovations are triggered by distress itself, as argued in particular by Ester Boserup (1981).

<sup>45</sup> In the words of Meadows *et al.* (1992, 222), the next “revolution” (along with the past agricultural and industrial revolutions) is that of the achievement of a sustainable system on a global scale. Three scenarios are envisaged, two of them result in global collapse; but, World3 “says that the limits are real and close, and that there is just exactly enough time, enough material, enough money, enough environmental resilience, and enough human virtue to bring about a revolution to better world” (1992, 227).



then claim it is the abundance of valuable natural resources (the so-called “honey pot” issue), rather than scarcity, that leads to violent conflict: the income deriving from gems, cash crops, drugs (Collier 2000; Le Billon 2001; De Soysa 2000), for example, assert that Malthus was wrong.

### **3.4 The environmental causes of conflict**

In the 1990s, Neo-Malthusianism's apocalyptic scenarios, already centered on resource stretching and environmental scarcity, were driven towards low-level domestic violence and the complexity and uncertainty of the post-Cold War era. For the first time, the outbreak of violent conflict was studied through the lens of environmental security, retrieving Malthusian concepts under a new methodological and conceptual perspective, that of environmental dynamics intended not as just as causes of conflict, but as contextual factors. The major trend in literature on environmental conflict was developed by the so-called second generation of environmental security, known for its in-depth methodological analysis and by the focus on state security (par. 3.4.1). The methodological framework developed by the second generation, also appreciated by international organizations, led later to the development of an integrated assessment framework, making research even more complex and formal but more suitable for policy-making (par. 3.4.2). In the meanwhile, a marginal trend in literature, far from adopting formal and positivistic methodology, aimed at reviving geography itself as an *explanans* of regional turmoil and chaos that characterized the international arena at the end of the Cold War, firmly rooted in the approach of Classical Geopolitics (par. 3.4.3).

#### **3.4.1 The Toronto School: measuring environmental scarcity through variables**

The first to apply rigorous methodology (particularly process-tracing) to empirical case-studies centered on environmental conflict was the pioneering Toronto School, led by Thomas Homer-Dixon through the Project on Environment, Population and Security University of Toronto and the Environmental Conflicts Project at ETH in Zurich. The Toronto School principally investigated Western Africa and South-East Asia: purposefully, it neglected the study of developed countries (Homer-Dixon 1995/1996, 190), making instead developing countries, those that more than any other was experiencing violence, the center of the whole approach.

The “school” emerged as a response to both limits to growth and conceptual debate. In this regard, in a Correspondence with Levy, Homer-Dixon explained his avoidance of the word “security” and his preference for terms such as “environmental stress” and “violence”

since “[V]iolence is easier to define, identify, and measure” (1995/1996, 189)<sup>46</sup>. The Toronto School indeed was characterized by an empirical turn where method and formal explanation were much appreciated. In the framework adopted by Homer-Dixon, for example, the *independent variable* was the *scarcity of renewable resources*<sup>47</sup> (not to be confounded with environmental degradation), affected by three important “sources”: “decreased supply of the resource due to depletion and degradation, increased demand due to population growth or increased per capita resource consumption, and unequal resource distribution” (Homer-Dixon 1995/1996, 191-192)<sup>48</sup>. Some authors then pointed out other factors, such as the impact of temperature anomalies on resource scarcity and depletion as causes of domestic and international violent conflict, focusing on case-studies in developing communities or states (Homer-Dixon 1991, 1994; Kahl 2006). As *dependent variable*, then, the Toronto School generally intended the *acute national and violent international conflict* caused by environmental factors.

The very key for explaining the outbreak of conflict (the dependent variable) lies in understanding the *intervening factors* (namely social effects), which “largely determine the vulnerability and adaptability of a society when faced with environmental stresses” (Homer-Dixon 1991, 87). Intervening factors make it possible to assess a given country's resilience, which is the threshold beyond which societies cannot effectively respond (Homer-Dixon 1991, 88). The four main social effects taken into consideration are the following: decreased agricultural production, economic decline, population displacement, and disruption of legitimized and authoritative institutions and social relations (Homer-Dixon 1991, 91). All these factors may then be “causally interlinked, sometimes with reinforcing relationships” (Homer-Dixon 1991, 91). The attention devoted to the causal mechanism linking the outcome (conflict) and the causes (environmental, social, cultural, and political factors) is typical of process-tracing method: indeed, in the words of the founder, “[T]he aim is to determine if the independent and dependent variables are actually causally linked and, if they are, to derive inductively from a close study of many such cases the common patterns of causality and the key intermediate and interacting variables that characterize these links” (Homer-Dixon 1995/1996, 194).

It is the detailed analysis of intervening variables leading to conflict (Kahl 2002) that makes the Toronto School at the same time close and different from Neo-Malthusianism. On

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<sup>46</sup> In one of his leading work, Homer-Dixon restricts the scope of the research “on how environmental change affects *conflict*, rather than security” (1991, 77).

<sup>47</sup> The main environmental effects considered by Homer-Dixon are: greenhouse warming, stratospheric ozone depletion, acid deposition, deforestation, degradation of agricultural land, overuse and pollution of water supplies, and depletion of fish stocks (1991, 88-89).

<sup>48</sup> For Homer-Dixon, for example, environmental scarcity is the product of total population in the region and physical activity per capita as “a function of available physical resources and ideational factors) and the vulnerability of the ecosystem in that region to those particular activities” (1991, 85).

the one hand, Homer-Dixon ends by embracing, at least partially, the Malthusian perspective: he claims, for example that “humankind will face multiple resource shortages that are interacting and unpredictable, that grow to crisis proportions rapidly, and that will be hard to address because of powerful commitments to certain consumption patterns” (1991, 101). On the other, William D. Matthew (2002) further moderates the neo-Malthusian argument, stressing the capacity to adapt to scarcities and the historical and structural dimensions of violence in explaining why some states succeed while others fail to adapt. Homer-Dixon, however, deliberately detached his work from the Malthusian perspective, specifying that his model aimed at including intervening factors such as physical, technological, economic, and social factors, permitting “great resilience, variability, and adaptability in human environmental systems” (1991, 78), a choice that which makes the understanding of environmental causality completely different from Malthus.

Criticism arises as the Toronto school did not focus on comparative research and did not provide null cases (Levy 1995b; Rønnfeldt 1997, 477). It also neglected to outline the conditions which are most significant for the outbreak of conflict. In the end, as it has been argued (Levy 1995/1996, 196), those case-studies did not provide significant material for policy-making. This made some accuse the Toronto School of being a sterile work, filled with “conventional wisdom” – in other words, works methodologically complex and rich in empirical evidence, but with no substantial contribution for the advancement of politics and general knowledge. The idea that environmental factors or climate are the main engines of history is not new, as well as the nexus between conflict and warfare (Livingstone 2015). On his part, Homer-Dixon defended the Toronto School as the first attempt ever towards the building of more complex theories and studies, which could have included, in the future, also null cases: such refinements, however, can be made only when research is sufficiently advanced (1995/1996, 194).

### **3.4.2 Towards complexity and multicausality: the integrated assessment approach**

Since the Toronto School, environmental modeling, especially climate models, has become more accurate and rigorous, devoting more and more space to social effects (including conflict). The need for including social and political framework has led, indeed, to so-called *integrated assessments*, the final refinement of the perspectives addressed so far, as the approach consists of an interdisciplinary analysis on the social, environmental, and economic domains, supported by quantification and computer simulations, and, notably, incorporating also stakeholders in the analysis (de Vos *et al.* 2013, 102). Such a mix derives from the fact that it is now commonly accepted, both in academic literature and policy-making, that pure quantitative research on environmental factors (such as quantification of temperatures, humidity, rainfall) fails to provide a non-deterministic account of the complexity of the empirical world. As stated by the United Nations (UN) General Assembly,

“(...) quantitative studies fail to confirm statistically significant links between environmental factors and conflict does not mean they do not

exist. Rather, environmental factors may exacerbate conflict dynamics and risk through multiple and indirect pathways, interacting in complex ways with social, political, and economic factors, which tend to be more direct and proximate drivers of armed conflict” (UN General Assembly 2009, 18).

The integrated assessment approach is gaining popularity. Officially proposed by the UN, it has been widely adopted in various guidelines released by international forums and organizations to states, such as the Intergovernmental Panel on Climate Change (IPCC)<sup>49</sup>. Moreover, the inclusion of several variables aiming at providing a closer image of today’s complex reality is also the hallmark of the third generation in environmental security (Rønnfeldt 1997): “[t]here is an increasing interest among scholars to broaden the field of analysis by expanding the scope of independent variables,” points out Carsten Rønnfeldt in her review of the development of environmental security (1997, 476).

On this line, the third generation expands its perspective on the relationship between environment and security towards the inclusion of variables derived from the social and political domains. Independent variables measuring environmental factors are thus followed by variables mirroring important human factors. It follows that usually the role played by environmental scarcity must be reconsidered and, sometimes, downsized. For example, Diana Liverman, who engaged in a study on potential links between environmental issues and conflict in Mexico (1994), admits complex social and political phenomena, such as the Chiapas rebellion, cannot be reduced only to environmental explanations; on the contrary, other factors as poverty, unequal land tenure, ethnic and elite politics, must be taken into consideration (2009, 8). Some authors (Nordas and Gleiditsch 2007), then, warn also from relying too much on models, such as those released by the IPCC, since models “make only scattered comments about violent conflict as a consequences of climate change, and when such a link is mentioned it is largely unsubstantiated by evidence” (2007, 628).

Giving a faithful representation of the complexity of the empirical world is a challenging task, however. According to Rønnfeldt (1997), a possible response for a more representative picture of reality through models may be to couple *quantitative analysis*, especially multivariate models, with regime theory (1997, 479). In this way, a more complex picture may be achieved by merging statistical analysis and studying norms, rules, and institutions affecting the outcomes of political processes (1997, 479). Another suggested improvement, this time for qualitative studies, can be research aimed at “disentangling of the causal chains between climate change and conflict” (Gleiditsch 2012), a sort of more refined and complex Toronto School, able to include not only climate change models, but also to balance positive and negative effects more rigorously and impartially<sup>50</sup>. A significant

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<sup>49</sup> In particular, see the 2018 IPCC Special Report.

<sup>50</sup> A specific literature trend has been dedicated to the nexus climate change-conflict, as it will be seen in par. 4.3.3.

example of this approach can be Nawrotzky *et al.* (2015) 's work merging climate change indices, migration, and sociodemographic control variables.

### **3.4.3 The revenge of geography: spreading chaos and crisis of room**

Contrary to formal approaches, it was instead the complexity of the ongoing events and the spread of disorder in developing states after the end of the Cold War, which was vividly depicted by Paul Bracken (1999) and Robert Kaplan (1994; 2002). Both authors grounded their work on the revival of geography as a fundamental factor affecting international politics. Their contribution is incredibly precious since it has been developed in years characterized by general optimism and even by the thesis of the end of geography. As the empirical turn, they also focused mostly on developing countries.

Despite a heavy focus on the pessimistic consequences of overpopulation recalling Neo-Malthusianism, the “revenge of geography” trend gave room to complex multicausality given by disruptive technology, geographical configuration, crowd psychology, ideology, and religion in explaining turmoil occurring especially in Asia (Bracken 1999) and Western Africa (Kaplan 1994). Nevertheless, overpopulation, together with the significant number of young males unemployed in Asia and the Middle East, remains the leading cause of the “crisis of room” persisting to our days (Kaplan 2013), leading to internal and international disorders, and potentially also to nuclear wars. Demographic, environmental and societal stress (2002, 7) are some of the factors taken into consideration by Kaplan in his journalistic essay published in 2002, partially retrieved from Bracken’s research on the destabilizing and disruptive effects of technology in overpopulated regions. It is claimed that such stresses are leading Asian and African countries towards anarchy, characterized by state collapse, disease spread, and a dramatic decrease in well-being. In “The Revenge of Geography” (2013), an essay dedicated to the persisting importance of geography on domestic and international politics, Kaplan sketches several pictures dedicated to various regions, drawing explicitly on Classical Geopolitics masterworks (e.g., “India’s Geographical Dilemma,” “The Geography of Chinese Power,” “Russia and the Independent Heartland”).

Generally, Bracken and Kaplan’s works effectively caption the complex multicausality and the interrelations of factors characterizing post-Cold War political disorder and conflict. Their works are valuable for two reasons: their successful retrieval of geographic factors in political analysis and the very emphasis on the complexity of world events, which have been so often reduced to formal and almost positivistic explanations. However, they end up devoting too little space to the presentation of their analytical frameworks to include geography, losing the opportunity for a more rigorous and less impressionistic revival of geography in IR. Unfortunately, the minor role that they played during the years of the “end of geography” made their works mostly stand-alone cases.

## 4. The case of climate: from climate determinism to IR literature on climate change

In the debate over environmental dynamics, *climate change* is undoubtedly one of the most discussed topics of our days. How IR has addressed climate over time is indeed an interesting topic that can confirm the arguments developed in the previous paragraphs. As it will be seen in the case of climate, the shift from “constant factor” to macroscopic and unpredictable “change” is evident in the shift from classical accounts to contemporary IR. Thus, this paragraph aims to demonstrate how climate has been addressed in the literature, from being one of the most stable geographic factors to one of the most unpredictable and worrisome environmental dynamics cases<sup>51</sup>. This paragraph will firstly outline how climate has been conceptualized as a geographical constant (par. 4.1). Then, it will be addressed how climate has been changing and which are the main features of the climate change phenomenon (par. 4.2). Finally, the major trends in IR literature on climate change will be presented (par. 4.3), looking for some trends based on climate change's strategic value.

### 4.1 Climate determinism in Geopolitics

Before continuing in the analysis, some definitions should be pointed out first. *Climate* is the average weather over a period of time. It is “the long-term statistical average of weather conditions” on a global scale, including the long-term behavior of the following parameters: temperature, air pressure, precipitation, soil moisture, runoff, cloudiness, storm activity, winds, and ocean currents. Climate includes both average conditions over time and the incidence of the so-called extreme weather events (Burroughs 2007, 2). It is influenced by causes external to the Earth-atmosphere system, such as volcanic eruptions, an increase in carbon dioxide, energy radiated from the sun (Visconti 2005, 16-17). Incorrectly used as synonymous with climate, *weather* instead is what happens internally to the atmosphere-ocean system or biosphere, thus over a short-time period (Visconti 2005, 17). Despite the general belief that climate determined human activity, historically, there has been hardly a consensus on what climate was, however. Climate has had various definitions over time, as stressed by Matthias Heymann in his study on the evolution of the concept of climate: “[U]nderstandings of climate were not static, but subject to significant transformations” (2010, 583), point out the author. Nevertheless, climate stimulated a significant debate on its influence on human activity from the micro-level (the human body) to the macro-level (communities) at least until the 1960s, when modern research based on climate models re-conceptualized climate in more dynamic terms (Heymann 2010, 591).

Until the 1960s, environmental causation (usually expressed in terms of anecdotes or correlations) was based on the absolute predictability of climate’s effects on political

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<sup>51</sup> As a subfield of environmental security, *climate security* deals with the effects that climate has on security.

expansion, cultural spread, and personal adaptability. According to the Sprouts (1960, 152), Variations of climate were a specific typology of geopolitical hypotheses based on the distribution of political power and influence and hypotheses based on variations in access to primary resources<sup>52</sup> (Sprout and Sprout 1960, 152). Moreover, the impact of climate on geostrategic planning was remarkable. According to some positions, thanks to the observation of climate it was possible to draw almost definitive benchmarks of the globe which were excluded from a state's geopolitical posture, rationalizing in this way the complexity of data-gathering and threat analysis: it was thus possible to focus on the relevant areas of the globe displaying the most favorable climatic conditions for the stimulation of positive (interest) or negative (threat) human activity.

As mentioned before, until the 1960s climate has been conceptualized as “stable in time within human-scales” (Heymann 2010, 581). Since Ancient Greece, it was claimed that remarkably stable climatic conditions caused detectable effects on the human body and groups sharing the same climatic conditions. This is indeed the core of the so-called *causal climatology*, also studied by philosophers. The origins of causal climatology are indeed in “On Airs, Waters, and Places” by Hippocrates (c. 460 BC – 377 BC), retrieved in Classical culture by Herodotus<sup>53</sup>, Plato<sup>54</sup>, and especially Aristotle. The Aristotelian study on climate enjoyed immense influence on the Scholastic Doctrine, indeed. Aristotle, in particular, focused on the influence of climate on political institutions and delivered a partially deterministic canon of causal climatology that persisted for centuries<sup>55</sup>. Also, Hippocrates' causal climatology did not undergo significant revisions during the Scientific Revolution. Both political philosophers and natural scientists studied climate, and until the second half of the eighteenth century, political philosophy maintained the Hippocratic-Aristotelian understanding of climate<sup>56</sup>.

Scientific accounts, on their part, also shaped by climate determinism, consisted in an empirical tradition of weather observations carried out by people cataloging mean temperatures and pressures, days of monthly and annual extremes, or the number of days of rainfall<sup>57</sup>. Climate was thus a subjective concept, shaped by personal narratives and experiences, a mix of objective descriptions and subjective feelings (Heymann 2010, 583).

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<sup>52</sup> The first category refers to Mahan, Mackinder, and Spykman, the second to Taylor Thom (Sprout and Sprout 1960, 152).

<sup>53</sup> *Histories*, especially II.77, VII 101-105, IX-122.

<sup>54</sup> *Menexenus*, *Laws* 747b-e, *Republic* 434e-436a, *Timaeus* 24c-d.

<sup>55</sup> *Politics* VII, 1327b18-38.

<sup>56</sup> Levinus Lemnius, *De Habitu* (1561), Jean Bodin, *Methodus* (1566), Montesquieu, *Spirit of Laws* (1748), Diderot and D'Alambert, *Encyclopédie* (1751).

<sup>57</sup> Meteorology is indeed the study of *weather*, with a focus on weather forecasting. On the difference between climate and weather, please see introduction to par. 4.

Finally, climatology became a grounded scientific discipline over the nineteenth century, thanks to Julius Hann, Wladimir Koppen, and especially Alexander von Humboldt. According to this latter, climate cannot be reduced to single parameters, like temperature, but it comprehends all atmospheric phenomena affecting human senses. This conceptualization led to a *spatial* understanding of climate.

Based on the direct observation of quantifiable patterns, causal climatology fascinated geopolitical analysis and stimulated in particular studies on the nexus climate-history (Huntington 1915, 6). Geopolitical hypotheses based on climate include two sets of variables - the climatic and the human – generally excluding other geographical factors. They can have indirect effects (on non-human factors) and direct effects (on humans), depending on the absence or presence of some intermediate agent or instrumentality between the climatic variables and human variables under consideration (Sprout and Sprout 1962, 359). This means that there is a causal link between geographical features and human activities, expressed in probabilistic terms. The influence/causality exerted by climate depends then on the degree of probability estimated by the analyst<sup>58</sup>. But what did “climate” exactly mean in geopolitical analysis? Generally, climate was expressed as a set of observable variables to be investigated one by one. In 1915, Ellsworth Huntington wrote: “[A]lthough we believe in the influence of climate, we know little of the particular climatic elements which are most stimulating or depressing. How much do we know of the relative importance of barometric pressure, wind, temperature or humidity?” (1915, 3). Harold and Margaret Sprout in their review of international politics, observed that “[C]limatic patterns do have an empirical basis; and it is possible to make some general statements more or less descriptive of the type of climate likely to be observed in the area in question,” in terms of “climatic variables” (Sprout and Sprout 1962, 358-359), which are *atmospheric temperature, relative humidity, air circulation, sensible temperature, barometric pressure* (Sprout and Sprout 1962, 343).

The following positivist quantification of geographical factors and their impact on the micro and macro level became the way through which not only political outcomes were explained but also a way to imagine, suggest, and even dictate optimized outcomes for the future. This was indeed the case of *climate determinism*, a subfield of environmental determinism. There are two typologies of climate determinism, one that *makes* people and one that *moves* people, according to Livingstone (2011, 250). Both have merged in anthropological research and in particular in *climate evolutionism* (Livingstone 2012). Initially, the acceptance of climate evolutionism was an essential step in the development of climate determinism. Using a north polar projection map, William Diller Matthew (1939) showed the configuration of major zoological regions on a global scale to show how man radiated outward from an original hub towards the margins of the globe. Such neo-Lamarckian positions were also held by Griffith Taylor (1919) and Henry Fairfield Osborn. Those arguments had a significant political value since they were based on the idea that

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<sup>58</sup> The opposite of climate determinism is climate indeterminism. It consists in the downplaying the influence of climate: “climate is relegated to a footnote in human affairs and stripped of any explanatory power” (Hulme 2011, 246).



climate made man evolve from the ape. This implies that some specific configurations of climatic variables can have extremely positive effects on the human being. A tradition going back to Hippocrates indeed considered bodily humors (blood, yellow bile, black bile, and phlegm) affected by elements (fire, water, earth, air). Such combinations affect the human body regulating overall physical and mental well-being. Huntington identifies two typologies of climate effects, physiological and psychological (1915, 49-50). The set of conditions that make the best outcome for the body is usually called climate *optimum*.

Optimum can be achieved at the micro and the macro level. Achieving a macro optimum means setting the best conditions for a community's prosperity. An interesting case was the study by Ellsworth Huntington, whose aim in "Civilization and Climate" (1915) was to outline "how ordinary people are influenced by ordinary conditions of weather" (1915, 53). To do so, he directly measured the "efficiency" of some groups under different climate conditions<sup>59</sup> by collecting empirical data on factory workers in America. In the end, Huntington suggested as the optimum for the stimulation of workers' productivity was a condition of 20°C and a humidity of 60% (1915, 8). On a greater scale, Huntington, then, studied also how diet, derived from climate conditions, have affected the vigor of civilizations, expressed according to different concepts, such as the "Indian nationalism" or the "Japanese prowess," but also migration or population density (Huntington 1945). Similar studies were conducted on North and South US cultures (Draper 1867) or states' aggressive impulses (Quincy Wright 1942). Optimum can then be identified also at the global level. According to their climate and the conditions set by it, global centers of power are characterized by the best conditions in terms of human will (direct) and resource potential (indirect). It follows that major international politics patterns are located in that area or take them into account. On this account, Ellen Churchill Semple stated that the "greatest historical developments belong to the North Temperate Zone" (Churchill Semple 1911, 611). A more moderate position was expressed by Spykman (1944) in the analysis of the distribution of power potentials on a global scale.

## 4.2 Climate change evidence

In addressing climate today, climate change immediately comes to mind. The very word "climate change" contains the concept of dynamism: it follows, quite obviously, that climate change can be considered a specific environmental dynamic that has been given considerable attention in literature because of its remarkable and macroscopic effects on natural and human systems<sup>60</sup>. To understand the difference between climate as it was intended in Classical Geopolitics and after, it will be necessary to outline, as first, its major

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<sup>59</sup> Especially monthly mean temperature, amount of change day by day, relative humidity (Huntington 1915, 137).

<sup>60</sup> Climate-related risks individuated by the IPCC (2018, 11) comprehend risks to health, livelihoods, food security, water supply, human security, and economic growth.

characteristics, starting from the difference between two concepts widely discussed: global warming and climate change<sup>61</sup>.

Global warming is a consequence of increased carbon dioxide levels in the atmosphere, caused mainly by the burning of fossil fuels, coal, oil, and gas, and widespread deforestation (Houghton 2009, 10). The energy radiated from the Earth's surface needs to balance the radiating energy coming from the Sun, which is neither scattered by the atmosphere nor reflected by land or water. Still, the radiation of the Earth depends on its temperature, so that the warmer the Earth, the more radiation is emitted (Houghton 2009, 19-20). The natural greenhouse effect, consisting of water vapor, carbon dioxide, and minor gases<sup>62</sup> filtering part of the thermal radiation leaving the Earth surface act as a sort of blanket covering the Earth and thus results in "the difference of 20 to 30°C between the actual average surface temperature on the Earth of about 15°C and the temperature that would apply if greenhouse gases were absent" (Houghton 2009, 20). Since the natural greenhouse effect is exacerbated by human activity, which makes the greenhouse "thicker," this phenomenon is called *enhanced greenhouse effect*. Consequently, the enhanced greenhouse effect causes an increase in the average global temperature, which is called *global warming*. As a distinct concept from global warming, climate change encompasses global warming<sup>63</sup>, as the "consequences" of global warming, broadly speaking, are defined as *global climate change*.

It is the *rate* at which climate is changing since the 1950s (IPCC 2013, 4)<sup>64</sup> that makes "today's" climate change a very peculiar one. Notably, as argued by John Houghton, co-leader of the Science Working Group of the IPCC from 1988 to 2002, "the predicted rate of change of 3°C a century is probably faster than the global average temperature has changed at any time over the past 10,000 years" (2009, 13-14). As far as we know, the injection of carbon dioxide into the atmosphere through the burning of fossil fuels has been causing a disturbance in the carbon cycle since the Industrial Revolution. However, it is not known precisely when climate started to change due to human activity, since accuracy in the measurement of the atmosphere components achieved high standards only in the 1980s through satellites. However, it is unequivocal that at least since the 1950s a warming process

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<sup>61</sup> It must be specified that despite global warming and climate change are strictly intertwined concepts and are sometimes used as synonymous, there are several political communication studies that demonstrated how different audiences respond to the use of the two terms (for example Whitmarsh 2009; Schuldt *et al.* 2011, Chapman *et al.* 2016).

<sup>62</sup> Methane, nitrous oxide, chlorofluorocarbons and ozone.

<sup>63</sup> NASA: <https://climate.nasa.gov/faq/12/whats-the-difference-between-climate-change-and-global-warming/>

<sup>64</sup> From the evidence provided by the IPCC (2013, 4) "[W]arming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia".

has occurred globally on the surface of the Earth (both land and oceans), resulting in the loss in the amount of mass in the cryosphere and sea-level rise (IPCC 2013, 4).

The first systematic study<sup>65</sup> confirming the existence of global warming is the so-called Keeling Curve graph (Keeling 1976), research by geochemist Charles Keeling who measured the concentration of carbon dioxide in the atmosphere overtime at the Mauna Loa Observatory, Hawaii, and later at the South Pole from 1958 to 1964. The Keeling Curve made through the application of one of the latest advances in climatology at the time – general circulation models<sup>66</sup> originally meant to test nuclear fallout - was a product of the Scripps Institution of Oceanography research project on carbon dioxide in weather modification, nuclear-test detection, and fallout (Lowe 2014, 17). Remarkably, the origin of Keeling's research was the geophysical project funded by the US Congress for the International Geophysical Year (IGY) 1957-58, a fundamental step in the history of global warming science. Thanks also to the studies by Roger Revelle on the monitoring of atmospheric constituents (1957), which demonstrated the validity of the theory on the anthropogenic origin of global warming<sup>67</sup> and, needless to say, the growing awareness of the increase in carbon dioxide in the atmosphere, global warming entered the stage of domestic and international politics during the Cold War, as a spin-off of state-funded research for military aims (Howe 2014).

It is commonly acknowledged that the great environmental conferences held from the 1970s onwards, following the publishing of geophysicist Wallace Broecker's article on climate change (1975), marked the beginning of the so-called environmental diplomacy and a focus on cooperative politics (and its difficulties) that has characterized climate as a political issue. This fact progressively obscured the Cold War origins of the research and the importance of global warming's consequences for national security and military activity. Forgetfulness has intensified especially since the 1990s: as argued by Howe in his study on the merging of global warming science and politics, "[I]n the two years between the IPCC first assessment report in 1990 and the introduction of the UNFCCC [*United Nations Framework*

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<sup>65</sup> The first studies on global warming were conducted in the early nineteenth century by the French physicist Jean-Baptiste Joseph, baron de Fourier, who investigated what accounted for the temperature of the planet, John Tyndall, who discovered greenhouse gases in 1859, Svante Arrhenius, who focused on the problem of rising carbon dioxide emissions in the wake of industrialization in the 1850s. Usually neglected in history of science, the steam engineer Guy Callendar reworked the theory of infrared radiative transfer and collected observational data on surface temperature trends in the 1930s. It must be remarked that the concept of climate by Arrhenius and Callendar did not fit their contemporary climatologic methodologies, as it was based on calculations based on physical laws (Heymann 2010, 589).

<sup>66</sup> Global Circulation Models are representations of the movement of the atmosphere as a whole, through observational data provided by irradiated material.

<sup>67</sup> The anthropogenic origin of global warming is today scientific consensus, around 97% (Oreskes 2004; Cook *et al.* 2013; Cook *et al.* 2016; Carlton *et al.* 2015).

*Convention on Climate Change*] in 1992 (...) this dominant international political paradigm unexpectedly and quite suddenly vanished” (Howe 2015, 171).

Today, the *existence* of global warming is generally common sense. At the end of 2018, the IPCC issued a Special Report upon the Paris Agreement's invitation (held in April). The Special Report is an alarming study on the consequences of global warming at 1.5°C, a threshold even lower than the previous threshold set out by the Paris Agreement (2°C): it is claimed that “[G]lobal warming is *likely* to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. (*high confidence*)” (IPCC 2018, 6). The alarming rate at which ecosystems are changing has recently urged civilian society to call for climate emergency and coin new terms to deal with this specific climate change, as *The Guardian* did in May 2019 (Carrington 2019).

Climate has continuously changed over time. However, past climate changes were long-term changes<sup>68</sup> (Behringer 2010; Fagan 2000; Johnson 2011; Endfield 2008; Bulliet 2009). For example, a period of global warming occurred in the Holocene (as stated for the first time in 1885, at the International Congress of Geologists), causing, according to some (for example, Behringer 2010), the Neolithic Revolution: its consequences were an increase in foodstuff, storage, and house construction, and an overall increase in population. The Middle Holocene (or Atlantic Period) is then generally considered a period of climate *optimum*<sup>69</sup>: glaciers melted on a wide scale and released large quantities of water, leading to North Africa's blossoming and releasing the Alpes from ice. The climate *optimum* led to the transition to New Stone Age in the Fertile Crescent, northern India, and China (Behringer 2010, 44-45)<sup>70</sup>. By contrast, the Little Ice Age was a cooling trend characterized by periods of average weather and hot extremes (Behringer 2010). Behringer (2010) identifies witchcraft as the symbol of the Little Ice Age: the clergy identified God's punishment in the impacts that nature was causing to people and, as scapegoats, women were directly blamed for the harsh

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<sup>68</sup> Detecting climate change in past times can be done through direct and indirect data. The former consists in the study of radioactivity, ocean sedimentum analysis, carbon dating (C14) in the case of organic sample or ice-drilling. Cross-checking can be made with indirect data, or proxy data, consisting in data deriving from sources such as archives, diaries, journals (Burroughs 2007, 95).

<sup>69</sup> From 7,000 to 5,000 year ago (NOAA: <https://www.ncdc.noaa.gov/global-warming/mid-holocene-warm-period>).

<sup>70</sup> Cooling periods can be caused by volcanic eruptions, as it was discovered by Benjamin Franklin (Burroughs 2007, 159). Great eruptions carry ash, aerosol and gases to the stratosphere, leading to a so-called *volcanic winter*. However, not all volcanic eruptions do alter the climate (Houghton 2009, 10)

weather and its disasters, the infertile soil (Behringer 2010, 133)<sup>71</sup>. Another evident and harmful consequence of global warming is the increased frequency and intensity of weather and climate extremes: for example, heatwaves (e.g., 2003 heatwave in Europe, 2018 heatwave in North America), intensity and frequency of storms and floods. Such events are also a recurring topic in the history of climate literature (Grove 2007; Mulchay 2006; Pérez 2001)<sup>72</sup>.

### 4.3 Climate change in contemporary IR

How and when has contemporary IR discipline included *climate change*? Notable impulse was given in the 1970s by the political debate on the “limits to growth” and the great environmental conferences<sup>73</sup> held in those years. Indeed, academic interest in “global environmental change,” a term by John Vogler, stems out as a response to political events: climate change became a topic addressed by IR with the rise of high politics after the “ozone diplomacy” led to the Montreal Protocol in 1987 (Vogler 1996; Benedick 1991). The literature on climate change has assumed different connotations according to IR perspectives. They have in common that they are generally policy-driven (Vogler 1996, 2) since they stem from immediate problems requiring political response. Thus, it is not surprising that in the first 1970s environmental arguments were developed as a “technical” issue. In the following paragraphs, a review of the major trends in contemporary IR literature on climate change will be presented, divided according to the macro-question that each trend addressed, going from the most grounded to the most fragmented: the role of institutions for the mitigation of climate change (par. 4.3.1), the focus on climate agreements within the institutionalist perspective (par. 4.3.2), the link climate change-conflict centered on correlation and causality (par. 4.3.3) and recent insights on militarization (par. 4.3.4).

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<sup>71</sup> Behringer, then, identifies also state building as an outcome of the cooling occurred during the Little Ice Age. According to this interpretation, state building was a reaction to the sense of insecurity due to harsh climate conditions. This interpretation of history based on climate takes the Sun King as another symbol of the Little Ice Age, as the hope given by the absolute monarch (Behringer 2010, 153).

<sup>72</sup> To differentiate between past climate changes and climate change detected in the 1950s persisting till today, from here onwards this latter will be called “abrupt climate change”. For the sake of readability, if there is no reference to the two typologies of climate change, abrupt climate change will be simply addressed as “climate change”.

<sup>73</sup> The UN Conference on the Human Environment held at Stockholm (1972), followed by the establishment of the United Nations Environment Programme.

### 4.3.1 The role of institutions in environmental and climate politics

Today, a major stream in IR literature on climate change is made by the debate on the role of institutions in the mitigation process of environmental problems, usually referring to the so-called Institutional or Neo-Institutionalist perspective in IR. Similarly to environmental security in its beginning, in the 1990s, the topic of climate change was part of a more general discourse comprehending environment, resources, and environmental politics, generally policy-driven and with advisory purposes (Mathews 1991; Porter and Brown 1991; Hurrell and Kingsbury 1992; Haas, Keohane and Levy 1993). However, it was clear that since the first years in which the debate over climate change was gaining ground, literature was intrigued by the role of institutions in environmental politics. Since then, institutionalist literature has devoted much work to the study of environmental politics, refining some concepts and developing solid theoretical assumptions that have been applied to a great number of cases, also according to formal models. The debate revolves around the role played by institutions and their effectiveness.

The issue derives from the nature of the absence of a central authority comparable to domestic authority able to provide order and regulation among states (Vogler 1996, 8). In a world still dominated by rival sovereign states, the emergence of global-scale environmental changes poses a striking contrast with short-sighted state-centered politics and calls for international cooperative approaches capable of overcoming the state system to solve transnational issues (sometimes, also global issues). *Institutions* are thus the means through which cooperation can be achieved: they are “persistent sets of rules (formal and informal) that prescribe behavioral roles, constrain activity, and shape expectations” (Keohane 1989, 3), and “international institutions are social institutions governing the activities of the members of the international society” (Young 1989, 6). Institutions can be, for example, bureaucratic organizations, regimes, or conventions (Keohane *et al.* 1993, 5). Institutionalism assumes that institutions are critical in the agenda-setting processes, following arguments typical of economics and game theory, which are based on the concept of “complex interdependence” developed by Keohane (1977). They also foster means and incentives for *effective* cooperation (Haas, Keohane, and Levy 1993).

It is not a case that environmental politics have so attracted institutionalism since it is especially in such transboundary issues that institutions are perceived as crucial for their effectiveness when compared to single-state politics: they are the only actor which has been able to effectively engage in providing a “solution” to climate change. Only international cooperation - this is common ground for institutionalists - “can preserve the quality of the planet for the future generations,” and successful cooperation can be achieved only through institutions (Keohane, Haas and Levy 1993, 3). Indeed, institutions can develop policies in line with advancing scientific understanding (Benedick 1991). This is also true in the case of international law (intended as an institution), which possesses “the ability to evolve and adapt dynamically to changing circumstances” and evolving scientific findings (Schiele 2014, 27, 28). Not only: institutions are also able to create networks for states themselves. Moreover, institutions, even those related to environment and climate, can then diffuse or non-diffuse under specific circumstances, according to Ovodenko and Keohane (2012)

The empirical evidence provided by reality, however, makes the problem of cooperation intriguing. The Prisoner's Dilemma, arms races, competition for renewable resources are just some examples demonstrating that "we can no longer afford the luxury of taking harmony for granted" (Young 1989, 4). *How cooperation can be effective* in environmental politics has been already the central theme of the work by Hurrell and Kingsbury (1992) and constitutes the point of divergence among authors, who focus on the role of different actors either from a broader theoretical perspective or in specific contexts.

In general terms, cooperation can be achieved through agreements negotiated by states and the development of institutions involving influential international and domestic actors (Greene 1996, 198). Both provide an important framework for international-domestic actors and processes interactions, and between science, power, and interests relevant for the issue at stake (Greene 1996, 198). Indeed, it is the "rescaling process" from the nation-state level that is the essence of environmental governance according to Andonova and Mitchell (2010): rescaling can proceed vertically (from domestic to global level) and horizontally (actors, linkages, connections, and coordination) and often they overlap and interact. Since the 2000s, institutionalist literature has definitively shifted to consider more atypical actors in environmental politics, "detaching" them from the state level of analysis, which was still present in the 1990s – sometimes contested, but without remarkable theoretical steps onward from the state model. Sometimes, the inclusion of non-state actors, such as international organizations, transnational scientific networks, business organizations, multinational corporations, and others (Okereke *et al.* 2009, 60), leads to global governance research, focused on explaining how those actors can behave beyond the formal state model, also in the case of climate governance (Okereke *et al.* 2009; Rothe 2011). The presence of overlapping regimes (Van Asselt 2014) and institutions (Zelli and Van Asselt 2013) makes climate governance even more difficult.

A specific debate then is centered on *international regimes*. Regimes are sets of "principles, norms, rules and decision-making procedures around which actor expectations converge in a given issue area" (Krasner 1983). International regimes are thus different from international organizations, institutions *per se*, or international order (as in Young 1989, 13). Regimes can be composed of state and non-state actors, depending on the issue at stake (for example, arms control, trade, monetary issues, fisheries, environmental politics), or both: for Porter and Brown (1991), for example, domestic politics plays a fundamental role in global environmental politics, as it reflects lobbies, advances in scientific evidence and non-governmental organizations at the international/global level. Concerning environmental politics, it is widely recognized that environmental regimes can be composed of governments, but also scientific institutions, advisory bodies, epistemic communities, and individual scientists.

Specifically, regimes go through different stages, from agenda-setting to institutional choice, implementation, and further development (Greene 1996, 199). Effectiveness of environmental and/or climate regimes may depend on a plurality of explanations, ranging from *compliance* and *verification mechanisms* (Vogler 2010) to the *typology of actors* involved in the framing: Vogler (2016, 21) asserts that the territorial approach to emissions, for example, "is simply outmoded", since "[l]ts territorial approach to emissions inevitably

reflects the assumptions of the sovereign states system, while governments have every short-run incentive, as illustrated in the struggle over aviation emissions, to protect national interests that are served by current rules and assumptions". Moreover, *organizational inertia*, derived from the persistence of "financial and politically self-interested incentives" contributes to regime fragmentation, as in the case of the re-organization of the UN system (Vogler 2016, 30) and, according to a plurality of institutionalist works<sup>74</sup> (Munck and Rosenschöld *et al.* 2014), it constitutes one of the main reasons for inadequate climate policy concerning climate change. International cooperation in environmental politics is then made difficult because of the persistence of *path-dependency* mechanisms already in domestic politics (Sabin 2010; Unruh 2000).

In evaluating regime effectiveness, the detection of causal forces, usually operationalized as independent variables (Young 2002, 74) and leading to outputs or outcomes, proves to be a challenge taken into consideration by the evolving literature (Young 2001; Ringquist and Kostadinova 2005, 86). Usually, some formal measurement of performance of international regimes is auspicated on the basis of standard instruments (Sprinz and Helm 1999), which can consequently contribute to problem-solving. Indeed, from the qualitative literature in the 1990s based on theoretical debates on regime formation and small-n cases, literature is moving towards sophisticated formal models based on integrated assessment (de Vos *et al.* 2013) to large-n quantitative analysis (Breitmeier *et al.* 2011; Tir and Stinnett 2012). Standardization in effectiveness measurement can foster cross-regimes comparison and learning: this is especially valuable for climate regimes, characterized by integrated assessment and multidisciplinary approaches, which can so benefit from lessons learned from other more "traditional" and well-established regimes, such as weapons and trade regimes (Bell *et al.* 2012).

In conclusion, it can be argued that institutionalist literature is at the moment the most well-established on environmental and climate politics. It has been the first perspective incorporating environmental issues and climate change, and still, in the 2000s, it has been "a growing industry" (Young 2002, 73). Since its beginning, Institutionalism has proven able to differentiate from both Realism and Behavioralism (Vogler 1996) in presenting shared common points (institutions, cooperation, interplay between domestic and international politics) and in applying grounded theory and sound methodology to the analysis of environmental politics in almost all of its expressions, from two-states agreements to great environmental conferences, passing through the well-established international regimes literature. Young (2002, 73) noted that since interest in this perspective has been progressively rising, significant progress has been achieved in developing analytic techniques, especially for evaluating regime effectiveness, which proves to be a remarkable contribution for the concrete mitigation of international (even global) environmental problems.

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<sup>74</sup> Possible explanations are catalogued by Rosenschöld *et al.* (2014) according to the following mechanisms: cost of implementation of mitigative climate policy, uncertainty and unpredictability, path dependence, sovereignty claims of nation-states, legitimacy for policy action. These explanations, however, regard mostly public policy and not the international realm.



At the same time, it can be pointed out that often institutionalist literature has displayed the tendency to incorporate too many issues under the general label of “environmental politics.” For example, climate change is usually addressed as a topic in single chapters of edited books on environmental issues or a stand-alone paragraph but more general papers on environmental problems<sup>75</sup>. Together with advancing research on independent variables (Young 2001) and the disentanglement of fragmentation (Zelli and Asselt 2013), a more careful analysis of what “environmental problems” are maybe a possible improvement for institutionalist literature. More specific and focused research on particular categories of environmental issues would be desirable, especially for advisory purposes, and may provide valuable insight into the overall environmental literature.

#### **4.3.2 Climate diplomacy: the path towards international governance**

A particular insight within the Institutional perspective on climate change concerns climate agreements for the mitigation of climate change. Climate agreements are indeed just one of the possible outcomes of international cooperation, but the sub-set in the literature dedicated to the specific treaty-making process is particularly worthy of attention because of its extent and the role it plays in policy-making. This literature indeed provides analysis on the effectiveness of climate regimes rooted in international agreements and, not surprisingly, stands out for its progressive evolution following the success or failures of major climate conferences. The first global conference on climate change, the World Climate Conference, was held in 1979 (Gupta 2010); since that moment, multilateral conferences and environmental organizations have been continuously evolving under the UN framework. Academic literature has analyzed the legal and political outcomes of conferences and has often been tailored to perform an advisory role for negotiators and policymakers. In this sense, it is worth reconstructing how theory and policy-making have been interrelated since the naissance of international environmental politics.

Literature has indeed evolved according to some temporal benchmarks. The first one was the success of the *Montreal Protocol in 1987*, which has rapidly risen as a model for the establishment of international environmental politics. Early studies have been focused on the very process of environmental diplomacy and negotiations: worth of mention is certainly that of Benedick (1991), which reconstructed the role of negotiators in the ozone regime in the 1980s. The “new diplomacy” model, which proved so successful in the ozone regime, consists of opening the room to scientists and public opinion.

Later, the *Kyoto Protocol regime (1997)* paved the way for discussing the effectiveness of a regime based on legally binding commitments, a regime that was usually considered flawed with respect to implementation and effectiveness (Aldy *et al.* 2003), and contextual differences among national actors participating at the Protocol (Rube 2007;

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<sup>75</sup> For example, Matthews (1991), Hurrell and Kingsbury (1992), or Ovodenko and Keohane (2012).

Tompkins and Amundsen 2008). As a matter of fact, compliance with the Kyoto Protocol has been scarce (see, for example, Shislov *et al.* 2016).

The following *failure of the Copenhagen summit (2009)* fostered an active debate on the very possibility of reformation of the climate regime through the introduction of different solutions: from the “building block” approach for the “post-Copenhagen era” by Falkner *et al.* (2010) to the study of the participation of “atypical” actors in climate governance, such as the European Union (Vogler 2009). Finally, the perceived success of the *Paris Agreement* in 2015 (Kinley 2016; Savaresi 2016) confirmed the need for new and more effective models of negotiation and treaty-making and the detachment from a model based on binding agreements to “a new season of climate governance” marked by enhanced multilateralism and cooperation, despite some inevitable flaws displayed by the Paris Agreement (Savaresi 2016, 26).

It goes without saying that mitigation itself is a complex problem. Overcoming the inherent challenges posed by international cooperation is indeed the starting point of literature devoted not only to theoretical advances but also to the solution of technical issues in policymaking and negotiating processes. The translation of “a long-term plan for climate policy into a consistent set of effective policy measures,” however, is a challenging issue because of some unescapable features: the time-inconsistency problem relating to a possible formation of a world government, the framing of moral and material issues in domestic politics, and the anarchy problem (Hovi *et al.* 2009). A journal article dealing explicitly with the problem of international anarchy is that by Thompson (2006), providing an optimistic view: international organization are seen as “international information sharing” (2006, 23), so that “[I]mproved information sharing with modest centralization to coordinate and assess would provide the institutional foundation for a politically realistic adaptive management approach” (Thompson 2006, 24), as already demonstrated by the cases of the International Labor Organization, the World Bank, and the Organization for Economic Cooperation and Development, possibly applicable to climate politics.

On a less general scale, the need for considerable investments in the short-run with benefits noticeable only in the medium to long term (the cost-benefits problem, according to Falkner 2016), the fact that some areas of the world are more exposed to climate change effects than other (Falkner 2016), and the overall uncertainty over the consequences of climate change, which inevitably slows the process of negotiations (Benedick 1991) are all unescapable issues from which literature on climate agreements moves on. Thompson, for example (2006), puts down a list of specific obstacles at different stages of “climate cooperation” (bargaining, transition, implementation). For his part, Von Stein (2008) looks for institutional characteristics affecting climate agreements' ratification. Problems also arise because of domestic political polarization (Bang *et al.* 2016). It is common ground to identify in the gap between developed and developing countries one of the most significant obstacles for the achievement of effective mitigation of climate change. This last point paves the way for the climate justice debate, sometimes expressed in terms of *rich versus developing countries* power relations (Athanasίου and Bear 2002; Simms 2000) or global south versus north (Hurrell and Sengupta 2012; Roberts and Parks, 2007). As recently expressed by Roberts (2011, 781) in terms of global economic structure, the problem consists in the fact

that “[M]any nations in the global South remain frustrated that despite many decades of promises and striving that they face persistent inequality and stalled economic development.” Thus, “[I]n the case of the US, its pigheadedness in negotiations might be seen as having been driven by insecurity in a shifting global political economy about its ability to provide jobs for its workers in the future where all sorts of work is moving to China and India” (2011, 781).

Has the international community been able to evolve and overcome the obstacles? Difficulties arising in the international climate policy regime have been fostering more debate on the most effective configurations for effective cooperation (Dovie and Lwasa 2017), and it is a common opinion that (after all) the Copenhagen summit has been a favorable critical juncture (Hale 2016). Indeed, Hale (2016) points out how the climate regime has been able to shift from a “regulatory” regime (based on binding and negotiating emissions) to a “catalytic and facilitative” regime achieved at Paris, which constituted a case of “multilateral adaptation and innovation in the face of gridlock” (2016, 12). This was made possible thanks also to the effective inclusion of sub-state, non-state and transnational actors, e.g., cities, sub-national governments, and businesses (Hale 2016, 13). Worth of mention is the role of epistemic communities (Haas 1990) composed of transnational experts developing solutions even in case of reluctant politicians: according to institutionalist theory, epistemic communities can easily interface between science and policy, contrary to sovereign states usually engaged in power politics. Actual cases of functional epistemic communities are the ozone diplomacy which led to the Montreal Protocol and the IPCC (Vogler 1996, 10).

On the Paris success, Falkner (2016) argues that the Paris Agreement acknowledged the primacy of domestic politics, allowing states to set specific levels of ambitions and recognizing that major powers cannot be effectively forced in cutting their emissions: the introduction of a bottom-up process of voluntary pledges made a model of “soft reciprocity” in which leading states (“coalitions of the willing” or “climate clubs” according to Falkner) or even non-state actors encourage other states in adopting mitigation procedures by way of example. Similar positions are shared by Höhne *et al.* (2017) and Kinley (2016) on the flexible framework and domestic politics involvement. Both are recurring issues in literature developed after Paris 2015. Indeed, the unacceptance of the US of the costs imposed on developed countries by the Kyoto Protocol was, according to Falkner *et al.* (2017, 4), one of the reasons for the failure of the Kyoto regime. Other solutions may be the proliferation of small agreements in contrast to an all-inclusive climate agreement as a more effective option (Hannam *et al.* 2017), the initiatives and talks held outside official and formal negotiations within civil society (Kinley 2016), and negotiations by state representatives in secretive talks in a way that could be perceived as legitimized, differently from what happened at Copenhagen (Dimitrov 2016).

### **4.3.3 Climate change as a driver of violent conflict**

One of the major but fragmented trends in contemporary IR literature on climate change is dedicated to the delicate process of assessing the relationship between climate change and conflict. This trend is usually the logic of large-N studies adopting quantitative

methods, aiming to demonstrate the correlation between climate change and conflict with the addition of control variables. For this reason, authors usually do not provide specific explanations but rather gather data into databases covering several cases (e.g., states, conflicts).

The concept of environmental conflict has already been presented in par. 3.4. It may be useful at this point to point out that the original Toronto School, usually included in the climate change and conflict literature, has not analyzed climate change *per se*, but rather the link between resource scarcity and conflict. The topic of *climate change* as a driver of conflict has definitely emerged in the literature as a stand-alone issue only in the 2000s. In 2007, for example, the journal “Political Geography” dedicated a special issue to climate change and conflict as one of the first systematic contributions to the literature. In this trend, IR was not alone: in 2007, as noted by Burke *et al.* (2015, 578)<sup>76</sup>, “only a handful of courses [*in development economics*] mentioned either conflict or climate, and leading development economics textbooks did not contain these words in their subject index.” In this paragraph, some remarks will be presented on the literature addressing specifically climate change as a driver of conflict: in particular, the heterogenous operationalization of the variables, or cause and outcome, the methodological trends, and the impossibility of achieving consensus.

At first, it can be easily noted that literature presents a great variance in the *operationalization* of both “conflict” and “climate”/“climate change” concepts, depending on the authors’ research purposes, areas, and actors under investigation. The concept of “conflict” addressed by literature is operationalized in various ways, ranging from interpersonal violence to international conflict. An increase in temperature positively correlated to an increase in *interpersonal violence* has been proved, for example by Mares and Moffett (2016) on a cross-national scale, concluding that “for each degree Celsius increase in annual temperatures in a typical country, homicides on average are predicted to increase by about 5.9%” (2016, 298). The hypothesis is not new and is sustained by studies conducted, for example, in the Netherlands (1994), the US (Cohn and Rotton 2003, Ranson 2014), and the city of St. Louis (Mares 2013). Indeed, it is generally agreed on the basis of empirical studies that climate change is likely to foster violent *intra-state conflict*, including interpersonal violence, rather than being a driver of *inter-state conflict* (Ide 2017, 2). Except for studies on climate and interpersonal violence, which have been conducted mostly in developed countries, the vast majority of studies on climate and conflict regards intra-state violence in the African continent and South-East Asia on a large. In the concept of “intra-state conflict” are thus included civil war<sup>77</sup> (Hendrix and Glaser 2007; Buhaug 2010; Wischnath and Buhaug 2014; Caruso *et al.* 2014; Maystadt and Ecker 2014; Miguel *et al.* 2004), conflict against the government (Burke and Leigh 2010), and low-intensity conflict, in case it is

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<sup>76</sup> The original study is by Blattmann and Miguel (2010, 5).

<sup>77</sup> To overcome the heterogeneity of concepts used in the literature, some have proposed the 1,000 battle casualties as a threshold for civil war (Burke *et al.* 2009), but the proposal have been criticized (Buhaug 2010) and it is still rejected by literature.

aggravated in prolonged warm periods, may prove to be valuable also for practical purposes such as the prediction of rebels' next moves (Landis 2014). Hence, literature still proposes different variable-related concepts that vary from author to author. It is worth noting that less interest has been dedicated to the study of international conflict (Tol and Wagner 2011; Gartzke 2012; Lee *et al.* 2013; Zhang, Lee and He 2007) and that international conflict is studied mostly in reference to water scarcity (Hauge and Ellingsen 2001; Gleick 1993; Gleiditsch and Hegre 2000; Toset *et al.* 2000). Generally, however, it is associated with low-level conflicts and not full-fledged war.

The disparity in literature is then aggravated by the differences in the operationalization of independent variables/causes. The most usual is the increase in temperature or some low levels of rainfall (Miguel *et al.* 2004; Hendrix and Glaser 2007; Hendrix and Salehyan 2012; Kevane and Gray 2008; Maystadt *et al.* 2015; Bohlken and Sergenti 2010), but also events such as storms and floods (Brancati 2007; Nel and Righarts 2008). Others (Hsiang and Burke 2014, 41) define climate in a more traditional way, as a function of climatic variables (temperature, rainfall, water availability), while Scheffran and Battaglini (2011, 530) generally describe "four major conflict constellations" addressed by literature, namely water stress, food insecurity, natural disasters, and migration.

Indeed, it is generally proven that a *positive correlation* exists between temperature anomalies/extreme weather events and social conflict. However, some authors dismiss the thesis on climate change as a driver of conflict and adopt different scales (Wischnath and Buhaug 2014; Gartzke 2012; Theisen 2012). For example, Hendrix and Salehyan (2012) claim that conflict risks increase with higher rainfall, and other authors claim that there is no systematic effect (Bernauer, Bohmelt and Koubi 2012; Deligiannis 2012, Salehyan 2008), or that states are more likely to cooperate than to wage war even in case of potential "water wars" (Wolf 2002; Dinar 2009). What Hsiang and Burke conclude (2014, 1-2) is that, similarly as for the Toronto School,

"there is no systematic and direct causal relationship between environmental degradation and violent conflict; rather, the effect of environmental changes on violent conflict appears to be contingent on a set of intervening economic and political factors that determine adaptation."

However, assessing the actual "*how mechanism*" is still a major problem for the literature. In reviewing 50 quantitative, Hsiang and Burke (2014) highlight the failure in determining "the mechanisms through which climatic changes influence the likelihood of conflict and instability" (2014, 52). In their review of quantitative research, Hsiang and Burke (2014, 52) claim that "conflict increases and social stability decreases when temperatures are hot and precipitation is extreme, but in situations where the average temperature is already temperate, anomalously low temperatures may also undermine stability." However, assessing "how" this association occurs is still at stake; and if causal relationships can be assessed and tested in case-centered studies, generalization presents major problems.

Cross-study comparison has been considered almost impossible because of the different operationalizations of concepts under investigation, with particular reference to geographic, temporal, and social scales used in the literature (Salehyan 2014, 3). Since ideal experiments cannot be replicated (Burke *et al.* 2015, 579-580), one of the most challenging tasks for authors engaged in cross-case studies is finding relatively homogenous populations. Even so, results of cross-sectional approaches are inevitably limited, covariates such as national per capita income or political indices cannot credibly account for the contextual diversity of populations and societies (Hsiang and Meng 2014, Burke *et al.* 2015). Moreover, in the case of causal-centered research, the assessment of causality between climate change and conflict (Gleditsch 2012) has undergone several critics on the methodological level, calling for more rigorous research and especially for the inclusion of contextual factors (or interactions) “such as national and local economic development, political institutions, and administrative capacity of national and local governments to address climate-related problem” (Koubi 2018, 348). The task is then aggravated by the fact that the social and political implications do vary considerably according to the specific environmental “factor” taken into consideration (e.g., water scarcity, deforestation, flood) (Hsiang and Burke 2014, 3).

The difficulties typical of causality-oriented research may be one of the reasons for the explosion of quantitative research on the correlation between climate change and conflict, which constitutes at the moment the mainstream method: it has constituted around 60% of the studies published in high-ranking journals on conflict and/or environment between 2007 and 2015 (Ide 2017, 2). Consequently, at the moment, large-N statistical analyses are the most likely to be taken into consideration for policy purposes (Ide 2017, 2-3). Finally, it is worth noting that, as pointed out by Koubi (2018, 344-345), while “climate change is a large-scale, long-term shift in the planet’s average temperature and weather patterns,” most research is focused “on the effect of short-term changes in weather patterns or climate variability” and thus literature fails in explaining in global terms the consequences of a phenomenon which is global by its very nature; one exception is the study by Hsiang *et al.* (2011) on the global-scale consequences of El Niño. It is, however, a comprehensible flaw because of the extreme complexity of the phenomenon under investigation: for this reason, some authors (Hendrix and Glaser 2007; Devlin and Hendrix 2014) operationalize the climate-variable as trends (long-term means, such as mean precipitation level and precipitation variability) and triggers (short-term deviations, such as year-to-year changes in precipitation). Against this background, the diversity and the complexity of the phenomenon itself, plus the inclusion of contextual factors, make even at first glance the hypothesis of a literature consensus impossible (Ide 2017). In the reasonable words of Salehyan (2014, 1), “[A]s yet (...) there is still no consensus about exactly how or why climatic variables – alone or in conjunction with other factors – matter for violence. In short, the discussion is no longer about whether or not the climate influences conflict, but about when and how it does so”.

#### 4.3.4 The militarization of climate change

A totally different focus on environmental issues and climate change, in particular, characterizes the “young” studies on the militarization of climate change. As much as various, they converge at least on one issue: they focus explicitly on the *management by military means or by military professionals of environmental issues*. Militarization typically refers to that particular moment when the militaries, as a matter of fact, are already dealing with the environment after having claimed that some environmental factor is a concern for the military (Gilbert 2012, 1). Today, the militarization of the environment is indeed a broad concept that encompasses even antithetical concepts on the role of the militaries with respect to the environment: for example, Michael Brzoska (2015) identifies no less than six possible “military futures” for the military addressing climate change (i.e., “greener,” “leaner,” “victims,” “rescuers,” “humanitarians,” “warriors”) based on an analysis of documents on security policy and defense planning. The study of militarization is however an ongoing perspective, on which little was published or commented systematically, and still much circulates in the form of grey literature or reports submitted to policymakers rather than professional journals or books (the major conceptualization of “militarization of climate change” are summarized in Figure 1.2.).

At first, when addressing the concept of the militarization of climate, or the more general militarization of the environment, it is important to underline that militarization is not securitization. While militarization and securitization are not mutually exclusive as phenomena, still one should not be confused by the fact that the response-process at the center of militarization studies may be stimulated by the inclusion of environmental factors in emergency politics, which is the core of the securitization theory. Or again, that the militarization response-process may occur along with a threat assessment process – again typical of securitization. But this should not confuse us: at the core of the militarization of the environment, there are the adaptation processes<sup>83</sup> managed by the military, and also a specific term focus on state security.

A basic distinction then considers the differences between *direct* (physical) and *indirect* (national way of life and national values) consequences. Both categories can be the object of military analysis and action. For example, concerning direct consequences, Levy considers “environmental degradation” as a direct physical threat to U.S. security. He argues that “[D]irect physical threats provide the most compelling rationale for considering environmental degradation to be a security risk, but they receive the least attention as security threats” (1995, 46), as it results in the loss of life or welfare to US citizens or endangers national values. It is evident that the “threat” here mentioned is still categorized according to the security-concept debate. Among the riskiest threats, Levy then includes stratospheric ozone depletion, complaining that the problem has not been framed as a security issue but “rather as a more mundane public health and chemical hazard problem” (Levy 1995, 47). Another direct security risk is global climate change, consisting of several effects (freshwater resources, sea level, rise, erosion, wetland loss, agricultural productivity, biodiversity, air quality, human health, and urban infrastructure), causing severe disruptions in American domestic economics (Levy 1995, 51). According to Levy (1995), indirect security

risks are desertification, ocean pollution, population growth, erosion, and biodiversity loss; they are “indirect” since their effects affect political change, which affects national values.

Generally, the militarization process has been morally criticized or generally given a negative value on various grounds. Indeed, the term militarization itself, at least with respect to the inclusion of issues normally beyond typical military influence, has been coined as a negative concept (Enloe 2004, 145)<sup>78</sup>. Its focus on state security is usually criticized by the proponents of different perspectives (e.g., climate justice, human security, climate governance) on the ground that conventional state logic may not be able to provide solutions to environmental problems. Then, some authors point out how militarization may prescribe the use of dysfunctional instruments, as sustained by the Copenhagen School (Buzan *et al.* 1995), and contribute to the rise of militarism (Brzoska 1995; Barnett 2001, 2003; Gilbert 2012; Marzec 2015). The very involvement of the military in environmental matters has been usually perceived as inappropriate (Butts 1994, 83) either because of the harmful effects on humanity and the environment or because the strength of the military would be broadened to ‘nontraditional’ social issues, as pointed out by Kent H. Butts (1994, 83).

Finally, a military response can develop according to two main typologies, which can account for the diversity of the critics moved to militarization. One typology of military response is indeed the result of the legitimization of the military as an actor providing *mitigation* to environmental issues (Haldén 2018, 6): this process may be accomplished through internal greenization. In the most extreme scenario, the military may be legitimized as the unique actor able to “fight” climate change after the securitization of climate change as a top national security issue took place<sup>79</sup>. This, eventually, seems to be the interpretation of a major part of the literature dealing with militarization. The second typology of response, which does not overcome civilian-military boundaries, is adaptation, consisting of adjusting to the natural system changes (Haldén 2018, 6). It is worth noting that adaptation does not forcefully entail the threat assessment step that is otherwise necessary in the extreme scenario aforementioned, although the two cases are not mutually excludable.

It is worth noting then that militarization, in its pure meaning, should not be confused with its possible *effects* or with the general impacts of military activity on the environment. It goes without saying that military activity contributes to environmental damage because of its very nature (Commoner 1967; Renner 1991; Coates *et al.* 2011; Pearson 2015). The negative impact on the environment is made not only by greenhouse emissions but also by equipment, tests of nuclear bombs, military bases, weapons production (both in peace and war), and warfare. The military activity works according to the concept of the “treadmill of destruction” (Hook and Smith 2005), which means that “an economic system predicated on constant growth generates ever increasing environmental degradation” (Jorgenson *et al.*

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<sup>78</sup> The original definition is “[T]hings start to become militarized when their legitimacy depends on their association with military goals” (Enloe 2004, 145).

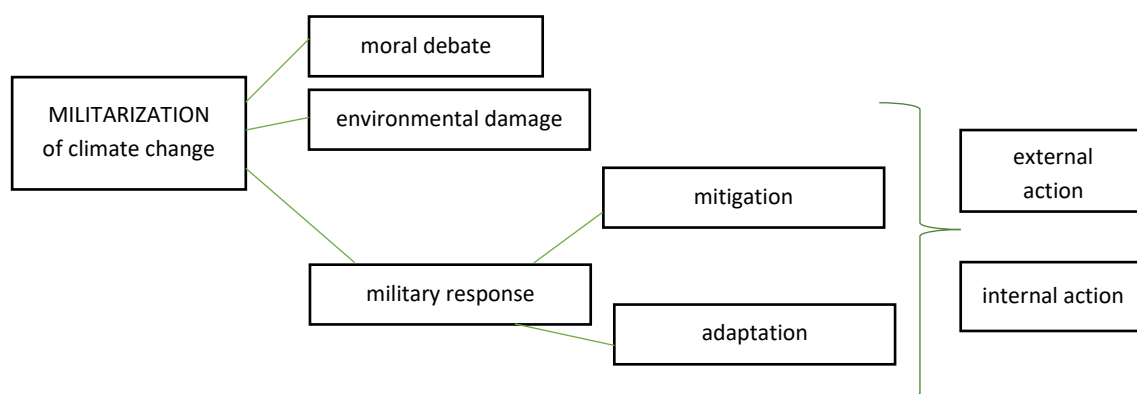
<sup>79</sup> On the debate on the *legitimization* of the responsibility to the militaries to fight and solve climate change, please see the reflection by Maj. Gen. Dunlap (2019).



2010, 9), as demonstrated by the work of Andrew Jorgenson *et al.* (2010). To sustain this thesis, namely that militarization is one of the main causes of the increase of greenhouse emissions, Melike Bilidrici, for example, finds out that “[T]he relationship between CO<sub>2</sub> emissions, militarization, economic growth and energy consumption” is positive and significant, both in a short-run and a long-run relationship (2017, 787). This point paves the path to studies on the greenization processes that are taking place in the military.

For some authors, then, the greenization process itself is just a way to advocate further funds to better cope with strategic and technical issues (Bigger and Neimark 2017). For others, very few, the military has still the capacity to correct their own “toxic legacy” on the environment (Butts 1994, 84) by becoming “positive agent of environmental preservation” (Butts 1994, 105) through programs of security assistance, the shift from weapon selling to nation-building, environmental sustainment, and small-scale unit training. On the domestic level, sharing expert advice and assistance to federal, local, and state agencies through actors such as the Corps of Engineers can be a solution (1994, 95)<sup>80</sup>.

**Figure 1.2 Possible meanings of “militarization of climate change.”**



Source: own elaboration based on the literature reviewed in par. 4.3.4

The militarization of the environment can then be framed in terms of external or internal action. *External action* means that the militarization of the environment results in channeling traditional human security issues (e.g., migration, disease) into state security logics, according to a conventional state-to-state response, disaster relief, and technical assistance to fragile states. This response has been already depicted by security documents

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<sup>80</sup> For example, the *Coastal American Program* (1991) aimed at reducing degradation and habitat loss. Among the participants, there were the US Geological Survey, the Environmental Protection Agency and the US Army Corps of Engineers. Another example is the *Defense Environmental Restoration Program*, managing toxic and hazardous waste deriving from military activity.

since years 2007-2010 (Center for Naval Analyses 2007, 2009; QDR 2010; UK Ministry of Defense 2010; Australian Government 2009). However, the analysis of *internal action* is almost absent in academic literature.

## 5. Conclusions

While Classical Geopolitics was concerned with the change of the geographical significance brought by technology (Spykman 1944, 7; Mackinder 1919; 1943) and later geopolitical literature included changes within the mental frameworks of politicians and communities (Sprout and Sprout 1965; Vidal de la Blache 1922; Lacoste 1976), today we are witnessing to a macroscopic change in physical geography itself, altering global average temperature at a dramatically high rate of change (global warming) and provoking changes also on topography (e.g., coastal erosion, increase in sea level, desertification). Those changes constitute part of a macro-category of global warming consequences called “climate change.” Even at first glance, it is evident how climate change is in striking contrast with classical and some neoclassical geopolitical accounts on climate – according to which, traditionally, it was possible for policy-makers to engage in geostrategic planning, basing the identification of threats and interests on geographical pivots valuable for their constant nature (see for example Gray 1977; Brzezinski 1997).

Since the end of the 1950s, worldwide scientific, social, political, and academic attention devoted to complex environmental dynamics has been considerably rising. In this regard, the contribution of environmental security, in its various perspectives, cannot be underrated, despite its distance from classical accounts. Indeed, one of the most significant advancements made by studies on environmental security centered on state survival is that of having drawn attention to the dynamics characterizing geographical factors. Those dynamics are, for example, changes in temperature, scarcity of resources, geomorphological changes. This is the first pattern that has been underlined in this chapter, namely *1) the shift from geographic constants to environmental dynamics* in IR literature. It is worth noting that early works addressing environmental dynamics (generally called “environmental changes”) did not focus specifically on either global warming or climate change. Research was usually centered on general concepts, such as “resources” and “environment,” and climate change used to be included into a broader category of environmental “changes” or “threats” to national security. This is, however, an important step to be considered: based on advances in geophysical and climatological research and growing civilian and political environmentalism, literature has been consequently “forced” to deal with changes, dynamics, and concepts that were attributable not only to technology or psychological effects but that were tangible (and worrisome) changes. Typically, such research was policy-driven and aimed at developing a *corpus* of “technical” literature on mitigation.

Since the 2000s, more specific literature on climate change as a stand-alone issue has been progressively developed. Based on recent IR literature addressing climate change, an issue that has emerged from this chapter is *2) the minor attention given to developed countries*. It should be underlined that the gap concerns adaptation but not mitigation – indeed, developed countries have usually been the main actors of climate diplomacy.

Research on adaptation is usually focused on the most dramatic consequences of environmental dynamics in “poor” areas, with few exceptions, for example, Haldén’s essay on the Baltic Sea Region (2018). However, it is worth noting that climate change is a global phenomenon by definition: while there are some areas dramatically concerned, also developed countries are struggling against its effects. As Scheffran and Battaglini (2011, 536) pointed out, climate change impacts on developed countries is generally moderate and sometimes may be even positive (a warmer climate can foster agricultural productivity, reduce the cost of heating and lower the rate of winter deaths). Nevertheless, they continue, developed countries are expected to be more damaged at higher temperatures. It goes without saying that the global research agenda should give priority to the most vulnerable areas in the world because of the urgency of the phenomenon; however, it can be argued that research on adaptation conducted in “developed” countries adaptation would be valuable also for a more comprehensive understanding of climate change.

Against this backdrop, a significant problem arises. There is indeed a remarkable difference between the role given to geography in classical and neoclassical geopolitical perspectives - which made possible the development of a geostrategic approach applicable for problem-solving and advisory purposes - and contemporary IR accounts in which geography is conceptualized into “problems” ranging from ozone depletion to climate change, addressed mainly through mitigation-based approaches. This difference is not surprising: since physical geography is changing so unpredictably, it constitutes an impressive problem calling for some “solution.” Nevertheless, one can still question whether there is still room for some role played by environmental dynamics on geostrategic planning, as partially addressed by the still-developing literature on the militarization of climate change. This latter, however, generally lacks theoretical frameworks in literature.

In addressing the major trends in IR literature on climate change, this chapter has remarked a third point, namely 3) *the gap in contemporary Realist literature and Geopolitical literature on climate change*. This gap is puzzling since it regards especially the adaptation process, which is the first step to be taken by security planners before establishing some international climate regime aimed at mitigating the effects of environmental dynamics. While Realism has generally neglected the study of those environmental dynamics, it cannot be said that the discipline of Geopolitics did not cope at all with climate change, however. Descriptive studies on “the geopolitics of climate change” are numerous, as well as institutionalist insights on governance referring to geopolitics, for example, in the Arctic (Ebinger and Zambetakis 2009; Heininen 2018). Nevertheless, they are conceived more as a “call to arms” for the inclusion of climate change in scenario planning (Hommel and Murphy 2013), or they adopt the Critical Geopolitics approach (Barnett 2007; Dittmer *et al.* 2011; Dalby 2013; Powell and Dodds 2014). Even the paper by Mackubin Owens defending the legacy of Classical Geopolitics (2015) addresses the role of technology and economics but does not mention climate change or changes in physical geography as factors challenging the classical analytical framework.

Moreover, the concept of the strategic value of space and environmental causality is hardly present in contemporary analysis when not purposefully avoided. On the one hand, works expressly dealing with the military dimension of environmental security, such as those

by Rita Floyd (2008) or Michael Thomas (2017), typically apply securitization theory. On the other, militarization literature, as far as valuable for its inputs, does not provide a unitary framework in which analysis can be conducted since it encompasses several perspectives, research object, and purposes which are hardly mergeable. An exception is constituted by Haldén (2018), whose work focuses on adaptation to climate change in the light of the shift from geographic constants to the changing geography in the Baltic region.

The reason for the gap, and the preference for approaches and frameworks avoiding traditional concepts, lies in the fact that generally Realism has been perceived as inadequate or lacking the effective tools for dealing with environmental problems for various reasons. Those reasons are the following:

I) the legacy of the Realist tradition itself has been perceived as an obstacle to the development of environmental security itself (Dyer 1996) - the exploitation of nature for warfare is a hallmark of *Realpolitik*, indeed<sup>81</sup>;

II) Realism has been typically considered as inadequate a perspective to deal with *inter-boundary issues* (such as pollution) because of its state-centered framework;

III) Realism has been perceived unsuitable also for dealing with *environmental degradation* because it has not been able to systematically include in the security agenda other threats than traditional threats;

IV) literature has abandoned the Realist framework also concerning *environmental conflict*, opting for approaches centered on the application of advances in Political Science methodology.

This last point, in particular, is noteworthy. As argued by Vogler in his review on environmental politics in IR (1977, 6-7), it was during the oil crisis in the mid-1970s that the academia shifted from a realist analysis centered on power relations towards a new appreciation of economic dimensions of international politics, and especially the complexities of interdependence (Keohane and Nye 1977), norms and values which were more effective with respect to the analysis of environmental problems. On the impossibility for Realism to cope with environmental conflict, Homer-Dixon (1991, 84-85) wrote that

“[T]he modern realist perspective that is often used to understand security problems is largely inadequate for identifying and explaining the links between environmental change and conflict. Realism focuses on states as rational maximizers of power in an anarchic system; state behavior is

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<sup>81</sup> Environmental warfare is “warfare in which the environment is manipulated for hostile military purposes” (Westing 1985, 646). On this, see also Westing (1984).

mainly a function of the structure of power relations in the system. But his emphasis on states means that theorists tend to see the world as divided into territorially distinct, mutually exclusive countries, not broader environmental regions or systems. Realism thus encourages scholars to deemphasize transboundary environmental problems, because such problems often cannot be linked to a particular country, and do not have any easily conceptualized impact on the structure of economic and military power relations between states.”

On his part, Vogler (1996, 6-7) pointed out how the fact that Realism usually did not include *values* in its research makes the development of environmental arguments difficult:

“the Realist analysis simply excludes or marginalizes environmental concerns, even where they have profound (though less immediate) security implications. (...). Realism makes positivist claims to objective knowledge and explicitly excludes values not associated with national interest. It would not admit that universalistic values of the type associated with the preservation of the biosphere can have political relevance in a world of selfish and competing nation states”.

Few are the voices arguing for the inclusion of climate change in Realism. According to a very recent essay by Jonathan Symons (2019), Classical Realism, for example, may provide some insights for a more effective mitigation thanks to its very neglect of ethical values. Paradoxically, “[R]ealism suggests that the most feasible climate mitigation strategies will be those that align with states’ narrowly conceived self-interests (Symons 2019, 156). According to this perspective, rooted in Morgenthau’s thought, national survival is conceived as an ethical imperative (Symons 2019, 149):

“[T]he Realist concept of a generalised ‘national interest’ that purports to transcend the interests of dominant social classes is usually said to derive its content from the context of anarchy – security is a public good that can only be provided by the state. A safe climate is also a shared national interest, yet the causal dynamics and spatiality of climate change mean that no state acting alone can provide ‘climate security’. Moreover, climate harms arise as an unintended consequence of the routine functioning of the international economy and political system. Consequently, Realist logics might appear irrelevant to climate politics.” (2019, 159).

With this respect, Symons acknowledges that a Realist logic, despite being overlooked by literature (2019, 159), is still the actual *modus operandi* of climate negotiations, as proven by the Obama administration (Kincaid and Roberts 2013). But it can be noted that the issue

addressed by Symons is centered exclusively on mitigation, and it is still a marginal, if not unique, voice in IR.

The fact that Realism has not systematically addressed environmental problems yet does not mean that it lacks *a priori* the tools and the frameworks for dealing with issues that, according to the perspective on the militarization of the environment and climate change, have profound impacts on state survival and national security. Those consequences are related not only to the most investigated areas (developing countries or less resilient countries) but also to developed countries which, as a matter of fact, are already facing the consequences of climate change on their security. Once assumed that “Geopolitics provides the link between geography and strategy” (Owens 2015, 477), the thesis of geography as a still valuable *explanans* cannot be entirely rejected. On the contrary, the first issue that national security is forced to face is indeed *how to adapt* to climate change consequences, leaving thus the mitigation issue aside. That being said, evidence from the ongoing adaptation process concerning national security should be integrated with insights on the theoretical ground as well, and it is worthy of investigation how Realism and Geopolitics, which have been tailored up to deal with national security, can at least provide some contribution with respect to the puzzles that are the closest to them. Is there still room in contemporary Realism and Geopolitics for considering the impacts of climate change (shaping geographical layouts of states) on national security as an issue worthy of attention?

## CHAPTER II

# Climate Change in a Realist Approach: The Case of US Adaptation in the North American Arctic

*“The specter of nature’s fury unleashed against the United States and its people might be the stuff of Hollywood blockbusters, but the odds are that real and very serious natural disasters will occur in the United States more frequently in the years to come”.*  
(Engelke and Chiu 2016, 16)

### 1. Introduction

The challenge posed by physical geography due to climate change calls for some Realist contribution despite the widespread opinion, observable also in the literature gap, that Realism lacks the conceptual and analytical tools for the inclusion of environment-related research objects in its analysis. At the moment, there is no major theory on the strategic value of space in contemporary Geopolitics or Realism, but at the same time, by looking at newspapers and policy documents, but it is undeniable that a process of “the co-optation of the environmental agenda by a traditional security agenda” (Dyer 1996, 24) is now taking place. This empirical trend presents features different from the traditional insights on climate change already discussed in academic literature<sup>82</sup>, mostly focused on the role played by diplomacy, civil society, and institutions: also traditional actors of national security<sup>83</sup>, such as the military or defense agencies, are facing the effects of climate change according to a more traditional approach rooted in state security, but the mechanisms through which they are acting are usually neglected in the literature or part of the still

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<sup>82</sup> International regimes theory, quantitative studies on conflict, securitization theory.

<sup>83</sup> As a subfield of environmental security, *climate security* deals with the effects that a changing climate has on security.

consolidating militarization literature<sup>84</sup> - sometimes, as mentioned in the paragraph on militarization (Chapter I, par. 4.3.4), more concerned with ethical issues than with the strategic domain.

For this reason, the inclusion of environmental dynamics (among those dynamics there is also climate change) from a Realist perspective means at the same time retrieving some key-concepts derived from previous disciplines or theories focused on the influence of geography on human activity and adjusting them to the requirements of the current context and the advances made in the literature. Thus, at first, it will be presented the analytical framework here applied for the inclusion of environmental issues in a Realist perspective still familiar with a typology of Geopolitics which is based on the strategic value of space (par. 2). Then, it will be presented how IR has dealt with the impacts of climate change in the Arctic, namely the area selected for the empirical case (par. 3). Finally, its major features (e.g., geographical area, actors, method) will be outlined (par. 4).

## **2. The inclusion of environmental dynamics in a Realist perspective**

This paragraph will indeed present an analytical framework for the inclusion of environmental dynamics in a Realist framework which can merge at the same time geography and the core assumptions of Realism, through the following logical steps: it will be argued that environmental dynamics have a considerable impact on territorial integrity, and thus on state survival (par. 2.1), that according to a probabilistic environmental perspective such impacts are neither necessarily perceived nor reacted to (par. 2.2), and finally, it will be presented how the relevant theoretical perspectives can merge for analytical purposes (par. 2.3). In the end, some words will be spent on the limits of this approach (par. 2.4).

### **2.1 The impact of climate change on territorial integrity**

As the closest perspective to Realism among those addressing climate change (at least because of the presence of topics such as national security handled by traditional actors), militarization literature provides interesting questions on “the co-optation of the environmental agenda by a traditional security agenda” (Dyer 1996, 24) and has the unequivocal merit of inserting into academic literature the phenomenon of the handling of climate change by the military and in general by national security, which does not have a place in other (more traditional) IR perspectives. However, “militarization” is still little more than a label, characterized by studies proposing different and even contradictory definitions,

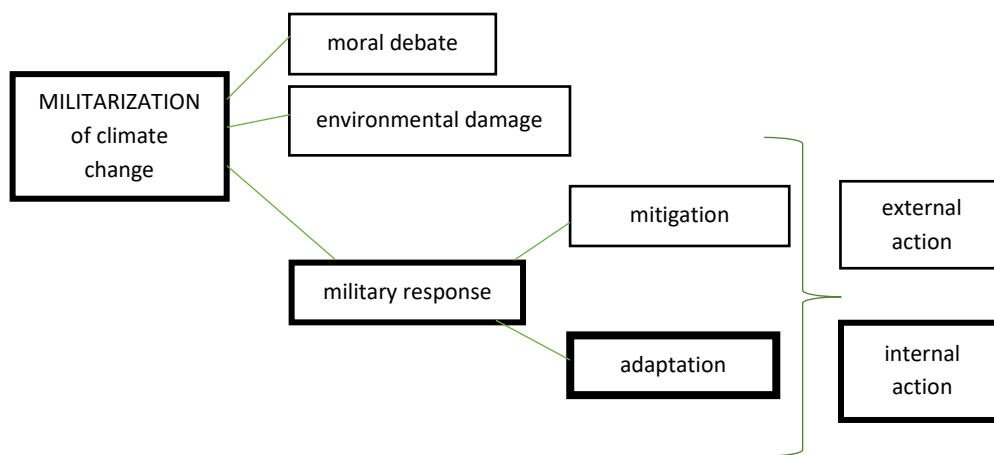
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<sup>84</sup> As noted some years ago by Kent H. Butts, the military plays “a significant environmental role, either because it is the law, or because it makes good sense as a logical paradigm in achieving military objectives” (1994, 83). Such moves, in terms of speeches, reports, and actions, are not always direct expression of a Realpolitik statecraft, especially since in those pieces of evidence the “environmental problem” is framed according also to liberal approaches or human security.



research objects, and methods. Here, from militarization literature has been derived an input *on the military response in terms of adaptation (internal action)*, as shown in Figure 2.1. This represents one of the most accurate approaches on how climate change is handled in national security planning. The choice of focusing on internal action at the expense of external action derives from a specific relationship that militarization has with Realism<sup>85</sup>, which will be explained in the next lines.

**Figure 2.1. The selected path within militarization literature.**



Source: own elaboration based on the literature reviewed in Chapter I, par. 4.3.4

Climate change effects are also divided into *direct* or *indirect*. *Indirect effects* of climate change are the most discussed by IR literature. As it has been seen, one of the major trends is centered on violent conflict, which, as largely demonstrated, derives indeed from intervening variables (or, more generally, factors). *Direct effects*, which are marginal in literature, are commonly called “threats.” They can pose serious concerns for both industrialized and developing states on various grounds, as summarized by Joshua Busby in one of the first papers taking into account the direct effects of climate change in developed countries (see Table 2.1).

In contrast to indirect effects, which, as it was seen, require a careful assessment of causal chains and interrelations among variables and factors at the center of a broad conceptual and methodological debate, direct effects of climate change are more evident and more clearly assessed by science. For example, it is estimated that Australian bushfires in January 2020 directly caused the burning of over 18 million hectares, the destruction of over 5,900 buildings (including 2,800 homes), and many millions of animals killed (UNEP 2020).

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<sup>85</sup> Common points among different Realist sub-perspectives: international anarchy; security as a prerequisite for other goals; persisting possibility of the use of force; the unequal distribution of power at the international level derived from the unequal distribution of power assets.

Phenomena like a dramatic biodiversity loss, smoke exposure, and inhalation, mental health costs deriving from emergency evacuation are all direct effects deriving directly from the bushfire season (UNEP 2020). On the same line, the heatwave in Summer 2003 is estimated to have directly killed more than 30,000 people in Europe (UNEP 2004). Climate change can also affect cities and government seats, so that

“a badly located capital (such as Dhaka, Bangladesh) could be vulnerable from sea-level surges following storms. A storm-damaged capital might lack basic services – electricity, transport, and water – making it difficult for officials to report for work” (Busby 2008, 476).

In the most extreme case, the physical existence of a state can be progressively canceled by climate change effects through severe impacts on *territorial integrity*. Until now, there has been no such a case, but very close to this condition are atoll islands and some areas in the Arctic region. According to the UN in 2009, “sea-level rise presents perhaps the ultimate security threat” (UN General Assembly 2009, 20). In the extreme case of the Carteret Islands, Papua New Guinea, coastal erosion, flooding, and salinity intrusion deriving from increasing sea-level rise and storminess are progressively canceling the islands themselves (Connell 2016), making their inhabitants the first official “climate refugees.” Another macroscopic case is that of Greenland, Denmark: on June 13, 2019, Greenland was estimated to have lost 2 billion tonnes of ice (Miller 2019).

**Table 2.1. Climate change as a “direct threat” to the homeland: some examples.**

<b>Does climate change pose a threat to the homeland?</b>
1) Climate change threatens the existence of the country;
2) Climate change could decapitate the seat of government;
3) Climate change threatens the country’s monopoly on the use of force;
4) Climate change could disrupt or destroy critical infrastructure;
5) Climate change could lead to such catastrophic short-run loss of life or general well-being as to undermine the government’s legitimacy;
6) Climate change could cause these effects on neighbors to spur refugee crises;
7) Climate change could alter the territorial borders or waters of the country.

Source: Busby (2008, 477).

On this basis, it can be stated that climate change (and generally, environmental dynamics) putting at stake territorial integrity can undermine not only the physical existence of states themselves in the most extreme cases but also their relative power. This is particularly evident when international anarchy is assumed. Indeed, anarchy makes states

more vulnerable when relative power (through which anarchy can be equalized) is weakened. Consequently, a state affected by some remarkable environmental dynamic may be devoting its internal effort towards an extended and costly response (e.g., damage to public health or infrastructure). In the defense sector, those responses may be, for example, the strengthening of military readiness or the allocation of funds and programs to respond to challenges even on the homeland, such as the reconstruction of a damaged military base (Myers 2019) or the performance of additional training for non-usual military activity (Sisk 2018).

It is worth pointing out that although cases of the *total* loss of a state territory have not yet occurred, the *potential* or *progressive* erosion is to be considered in long-term strategic planning: the unpredictability of climate change effects should thus not make security planners underestimate the problem. Indeed, the mechanisms through which harms to territorial integrity may happen are complex, and they vary from state to state, according to the state's degree of resilience<sup>86</sup>. In the US case, direct impacts on the homeland have been reported in 2008 by Busby and more recently by Peter Engelke and Dan Chiu (2016)<sup>87</sup>; both works (the first is an academic article, the second a report sponsored by the Atlantic Council) address direct impacts on US homeland. Busby claims that there are several direct threats among how climate change constitutes a national security issue (2008, 470). The same is sustained by Engelke and Chiu, who claimed that “while the North American landmass will not disappear, the US homeland nonetheless will suffer from the increasingly severe effects of climate change” affecting “US natural resources (e.g., soil, forests, freshwater systems), infrastructure, cities, and citizens” (2016, 1).

While it cannot be denied that climate change can also have positive effects, literature hardly addresses this point. The fact that climate change can positively affect social and political mobilization is seldom considered. It has been discussed in reference to the outbreak of Arab Springs, as climate change is considered one of the factors that triggered regime change in the Middle East. In this regard, Sarah Johnstone and Jeffrey Mazo assert that “climate change played a necessary role, even if it was obviously an insufficient trigger on its own” (2011, 11). Francesca de Châtel (2014) stresses the risk of blaming external factors, such as drought or climate change, for political failure and inability to reform (2014, 532) and that “[T]he government's failure to adequately respond to this crisis was one of the triggers of the protests that started in March 2011, along with a host of political, economic

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<sup>86</sup> By resilience it is commonly meant “the amount of change a system can undergo and still retain the same controls on function and structure while maintaining options to develop” (Nelson, Adger and Brown 2007, 396) - the concept can be applied to both human and non-human systems. It derives that while for less resilient states the effects are macroscopic and dramatic, in the case of more resilient states (usually rich states) those effects can be less evident or even unperceived.

<sup>87</sup> In addition, Diez, Lucke, and Wellmann note that “the main problem in the US is the prevalence of the territorial danger discourse, at least since the 2000s” and that “this has legitimised a focus on military adaptation measures” (2016, 36).

and social grievances” (2014, 532). In general terms, positive effects on developed countries can be “a greater agricultural productivity, reduced winter heating bills, fewer winter deaths” (Scheffran and Battaglini 2011, 36). Climate change can also uncover natural resources in the melting Arctic, for example, but the competition that derives from it makes it difficult to consider it positively<sup>88</sup>. In the long-run, the effects of global warming can quickly turn to negative effects and then deteriorate with the increase of greenhouse emissions (Busby 2007, 4). In conclusion, while it is theoretically possible to envisage positive effects on state security, such positions are hardly present in literature and policy-making practice.

## **2.2 How envired units frame climate change impacts from a probabilistic perspective**

The fact that climate change can harm the territorial integrity of states does not necessarily entail some reaction by policy-makers. This is a point that can be applied not only to factors related to the non-human environment but also to social factors (Sprout and Sprout 1965, 11), which “can be perceived, reacted to, and taken into account by the human individual or individuals under consideration” (Sprout and Sprout 1965, 11). This is indeed the only way according to which environmental factors (both human and non-human) “can be said to ‘influence,’ or to ‘condition,’ or otherwise to ‘affect’ human values and preferences, moods and attitudes, choices and decisions” (Sprout and Sprout 1965, 11). Moreover, it is noteworthy that environmental limitations can be effective even though they are not perceived or reacted to (Sprout and Sprout 1965, 11). From a theoretical perspective, the relation between environment (in its double meaning) and human individuals has been addressed by the Ecological Perspective, a theoretical perspective partially derived from Classical Geopolitics. Two points are precious for the research: 1) the distinction between operational milieu and psychomilieu, 2) the distinction between environment (also intended as non-human environment) and envired units.

Concerning the first point, the fact physical geography is changing can be unperceived by policy-makers. Consequently, responses in terms of adaptation or mitigation can be less or more effective, depending on the degree of consciousness of the change. The response also depends on many contextual factors both at the state and local level and on the historical and geographical context in which the envired unit is located. According to the Ecological Perspective, in its most objective sense, the environment is constituted by non-human factors external to human activity, defined as “operational *milieu*” (Sprout and Sprout 1965, 30)<sup>89</sup> or fact of location (Spykman 1938, 40). Thus, the operational *milieu* is the *milieu* conceived in its total isolation from inner-perception “as it would appear to an observer who sees and knows all” (Sprout 1965, 136). However, it can be noted that

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<sup>88</sup> On the Arctic case, please see par. 3.3.

<sup>89</sup> As remarked previously, the Sprouts (1965) addressed in their work the analysis of the environment as made by both human and non-human factors (*milieu*).

“[T]he significance of such facts changes with every shift in the means of communication, in routes of communication, in the technique of war, and in the centers of world power, and the full meaning of a given location can be obtained only by considering the specific area in relation to two systems of reference: a geographic system of reference from which we derive the facts of location, and a historical system of reference by which we evaluate those facts.” (Spykman 1938, 40).

Indeed, the geographical setting “as it is seen and reacted to by a particular individual” (Sprout and Sprout 1965, 28) is different from the operational *milieu*. This “image” of the operational milieu is called “psychomilieu.” The psychomilieu consists of an image

“derived from some sort of interaction between what he [the observer, or envired unit] selectively receives from his milieu (via his sensory apparatus) as his scheme of values, conscious memories, and subconsciously stored experience” (Sprout and Sprout 1965, 28).

Another significant input deriving from the Ecological Perspective is the distinction between environment and envired units. This latter can be applied to various actors, such as human groups, formal organizations, and abstract entities (1965, 33). It is the envired unit under investigation that reacts to the environment. According to a well-known example, the operational *milieu* at the time of the Japanese attack on Pearl Harbor in December 1941 (in this case, the Americans are to be considered the envired unit reacting to a specific environment) was significantly different from the American *psychomilieu*. Indeed, “[T]he environment as they perceived it contained no hostile fleet” (Sprout and Sprout 1965, 12), but “the Japanese fleet was indubitably and ingredient of the environment in which the decisions of the American commanders were executed” (Sprout and Sprout 1965, 12).

It can be concluded that taking into account the difference between the fact and the significance of the fact of location is a fundamental step in the assessment of the influence of the environment on some human activity: it can thus account for the fact that also changes in physical geography, such as climate change, are not necessarily perceived or reacted to by some actors, or they are reacted differently depending on the actor under investigation (individuals, communities, local governments, state-level) following a causal relation underpinned by environmental probabilism.

### **2.3 An analytical framework for environmental dynamics (and climate change)**

It is now possible to outline an analytical framework (Figure 2.1) for the inclusion of geography into a Realist perspective (one that respects the assumptions specified in par. 2.1), based on the merging of inputs coming from Classical and Neoclassical Geopolitics, Neoclassical Realism and Ecological Perspective. The very aim of the framework is that of

relating changes in physical geography due to climate change, territorial integrity, and the “image” that actors have of this relation from a “traditional” national security perspective (referred to Realism and Geopolitics) which is still discussed in those days by military leaders and defense agencies.

The basic tenet is that climate change has remarkable impacts on the territorial integrity of states. Classical Geopolitics indeed considers geography as the unescapable setting of all human activities. This analysis will proceed on the basis of this assumption, as well as on the assumption that physical geography affects human activity in probabilistic terms. Neoclassical Geopolitics moves precisely from this ground and aims to explain non-conventional issues in an eclectic way without abandoning Classical Geopolitics basic assumptions. Following this logic, environmental dynamics are a case of “non-conventional” issue which challenge the very assumption of Classical Geopolitics on the constant nature of geographical factors.

It is necessary, then, to make geography converge with the complexity of human activity (expressed in terms of outcomes in national security planning). Neoclassical Realism<sup>90</sup> stands as one of the best-suited theories for analyzing policymaking and can be easily translated into national security planning. Contrary to Structural Realism, Neoclassical Realism is centered on the study of the *perceptions* of relative power and not on strict capability analysis (Rose 1998, 147). Nonetheless, it retains from the realist mainstream an analysis embedded in the systemic level, permitting thus research not based on epiphenomenal variables (Rose 1998, 165). This point is crucial, especially in the study of “non-conventional” phenomena that require rigorous and robust theoretical frameworks.

Usually, Neoclassical Realism research questions focus on “how, in actual cases, relative power is translated and operationalized into the behaviour of state actors” (Rose 1998, 166). Unit-level variables permit the understanding of how systemic imperatives are filtered through the state structure by the state apparatus, in terms of top leaders (Taliaferro *et al.* 2009, 3-4), explaining thus the variety of outcomes in comparative or case-study research. Neoclassical Realism itself is made of the convergence of more Realist currents: Classical Realism and Structural Realism. From Classical Realism (Morgenthau 1948; Wolfers 1951; Kissinger 1957), it retains the insights on statecraft's internal mechanisms; from Structural Realism, it derives some major theoretical concepts, such as the international system. Indeed, Structural Realism (Waltz 1979) argues that the system puts pressures and incentives on state actors; to secure themselves from anarchy and uncertainty, states pursue power in terms of material capabilities<sup>91</sup>.

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<sup>90</sup> Born from the merging of Neorealism and Classical Realism, Neoclassical Realism is a quite recent “school” of IR, presented in the manifesto” by Steven E. Lobell, Norrin M. Ripsman and Jeffrey W. Taliaferro (2009) on the basis of the original essay on Neoclassical Realism by Gideon Rose (1998). Authors usually quoted are William C. Wohlforth, Cristopher Layne, Aaron L. Friedberg, Thomas Christensen, Randall Schweller, and Fareed Zakaria.

<sup>91</sup> To a degree at dispute in literature (see Waltz 1979; Mearsheimer 2001).

Based on what was said in Chapter I, physical geography can be inserted in the framework as an exogenous factor<sup>92</sup>: the geographical setting in which human politics takes place affects *the distribution of relative material power*. The change brought by some environmental dynamics exacerbates the relation. For example, in the case of the rise of global mean temperature, which causes coastal erosion, melting of ice and provokes disruptive economic and societal damage, global warming affects crucial features of state power such as territorial integrity and power projection capabilities – fundamental state assets for the neutralization of the effects of anarchy in the system. According to Neoclassical Realism, the link between international system level and outcomes is filtered through the state apparatus, usually according to a top-down model, namely a circle of top leaders and officials (Ripsman 2009; Dueck 2009)<sup>93</sup>. In this case, without the implementation of some adaptive capacity in politics and/or strategic planning, the impact that environmental dynamics have on states' relative power is likely to make it decline and make the state itself more vulnerable to the effects of anarchy in the international system (*external vulnerability*). Environmental literature underlines how the impact of global warming on some unit of analysis (vulnerability) can be neutralized through its adaptive capacity, the degree of which is given by the actors' reaction. As Neoclassical Realism underlines, systemic imperatives (both incentives and constraints) are transmitted through an imperfect transmission belt to the unit-level (Rose 1998, 147), which on its turn produces outcomes in terms of diplomatic, military, and foreign economic policies (Taliaferro *et al.* 2009, 4).

Concerning the response to environmental dynamics, the focus must remain on changes in physical geography. The Ecological Perspective provides two useful concepts already discussed (par. 2.2): operational *milieu* and psychomilieu, and the relation between environment and enviroined unit (Sprout and Sprout 1965). This latter must be defined

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<sup>92</sup> Complex interrelationships between the anthropogenic causes of environmental dynamics are not considered here. Indeed, it is evident that the framework in which climate change is situated is a vicious circle, as outlined by the UNFCC integrated framework for climate change (a representation can be found in Houghton 2009, 19).

<sup>93</sup> A broader perspective on the inclusion of societal elites is proposed for example by Lobell (2009).

according to specific research objectives<sup>94</sup>: for example, in the case of a study on local adaptation, the enviroined unit may be a coastal community, or in the case of analysis on militarization and climate change, it may be the military. For the purpose of this research, it is retained from Neoclassical Realism the top-down conception of the state, which restricts the enviroined unit to “a national security executive, comprised of the head of government and the ministers and officials charges with making foreign security policy” (Taliaferro *et al.* 2009, 25). According to the probabilistic geopolitical perspective, the enviroined unit is not forced to deal with the issue at stake: the degree of interiorization may depend, for example, on various factors (past experiences, values, strategic culture, just to mention a few possible examples). It follows that reactions can be unperceived, or may not be reacted, or can be purposefully ignored. In this case, the challenge is to find out the reasons for the non-reaction or to identify the sectors that are more sensitive and discover the reasons underpinning their involvement.

Concerning the concept of “environment,” it should be specified that for the research objectives, it is necessary to remind that for the purposes of the research, the concept of environment is not the same as in the Ecological Perspective. While the Ecological Perspective is centered on the study of human factors composing the environment, here the concept of environment is restricted to *non-human factors* (physical geography), which in the original theory constituted only one (and not the most important) of the sub-sets of factors “enviroining” the unit under analysis (Sprout and Sprout 1965, 15)<sup>95</sup>.

The rationale for this analytical framework lies in the fact that environmental dynamics have not been studied extensively by contemporary Realist and Geopolitical literature. There are references to geography in Neoclassical Realism, but they are not deeply investigated, and, most importantly, there is no theoretical background dealing extensively with geography as a factor that conditions foreign policy: for example, Taliaferro (2009, 211)

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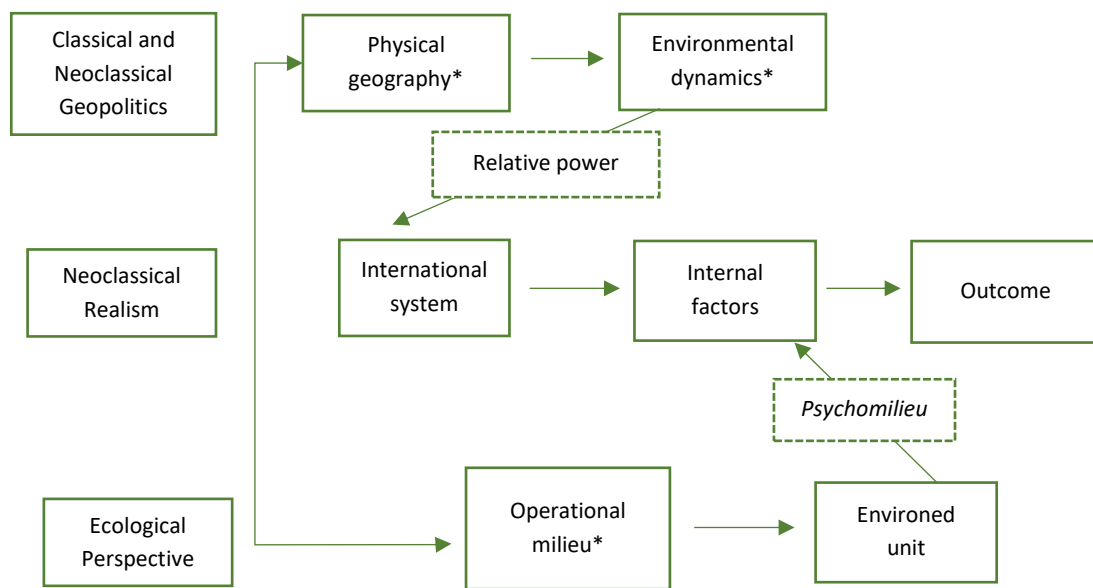
<sup>94</sup> In the original framework, Taliaferro *et al.* (2009, 24) adopt a Weberian definition of state: “a state is a human community that (successfully) claims the monopoly of the legitimate use of physical force within a given territory”. Neoclassical Realism presents indeed a “top-down” conception of the state, in the sense that “systemic forces ultimately drive external behavior” (Taliaferro *et al.* 2009, 25). The state is thus “epitomized by a national security executive, comprised of the head of government, and the ministers and officials charged with making foreign security policy” differently from other approaches, were the state is composed by “aggregating the demands of different societal interest groups or economic classes” (2009, 25). In this perspective, national interest is defined on the basis of the assessment on relative power made by leaders. On their part, leaders are also subject to domestic constraints: thus, bargaining, constraints and cultural legacies are not excluded from the analysis.

<sup>95</sup> From here it derives the very term “Ecological Perspective”, intended as the study of all the factors (for practical purposes, only those that are significant for the research, so that the research is free to select the most suitable for her research) that influence political behavior by surrounding or enviroining a unit, with a specific focus on sociological and psychological factors (Sprout and Sprout 1965, 202, 40). For this reason, in the Ecological Perspective was introduced the concept of *milieu*, which indicates the environment composed by both non-human and human factors, as opposed to the term “environment”.



inserts “geography” in his model on state resource extraction as a factor affecting the level of external vulnerability, together with the relative distribution of power and the offense-defense balance. In that case, geography is intended as geographical proximity (2009, 213). Because of this reason, the analytical framework is integrated with inputs coming from other disciplines or theories (which have never been framed according to contemporary academic frameworks) built on the nexus environment-political activity, such as Classical/Neoclassical Geopolitics and the Ecological Perspective. The Neoclassical Realist framework, then, is focused on the study of the internal processes that translate systemic incentives into policymaking, unboxing the internal mechanisms that can explain a variety of outcomes not only in the same international system but also across different systems. To sum up, the point of contact between Geopolitics and Realism is the potential damage that some environmental dynamics pose to states’ territorial integrity, making them more vulnerable to the effects of anarchy in the international system.

**Figure 2.1 Analytical framework.**



Source: own elaboration based on Sprout and Sprout (1965), Rose (1998), Taliaferro et al. (2009).

## 2.4 Possible alternatives for a comprehensive understanding of climate change

The analytical framework previously presented is meant to be an integrative contribution towards a comprehensive understanding of the nexus man-environment, and it is far from being a rejection of the validity of other perspectives derived from environmental

security. On the contrary, this research aims at contributing to the general understanding of the effects and interrelations between environment and human activity, but from a limited perspective, that of the impacts of environmental dynamics on national security. Such a framework tends obviously to be centered on national security as the ultimate means to provide *territorial integrity as a function of state survival conditions of international anarchy*.

Still, this does not mean that an analysis on the erosion of territorial integrity must necessarily focus on the state as a unit. Some alternatives have been analyzed in terms of discourses in other studies. Thus, it can be stated that a *specific “discourse”* is that which conceptualizes climate change as a national security threat. As argued by McDonald (2013), such a discourse is based on “the preservation of the nation-state in the context of a problem that seems to precisely challenge the relevance of territorial borders” (2013, 45). This discourse is advanced mostly by policymakers, departments, and military professionals and aims to adapt (and the *solution* of the problem) as a priority, even in developed states (2013, 45-46).

**Table 2.1. Possible climate discourses on climate change.**

<b>Discourse</b>	<b>Referent</b>	<b>Threat</b>	<b>Agent</b>	<b>Response</b>
<b>National security</b>	Nation-state	Conflict, sovereignty, economic interests	State	Adaptation
<b>Human security</b>	People	Life and livelihood, core values and practices	States, NGOs, international community, communities	Mitigation
<b>International security</b>	International society	Conflict, global stability	International organization	Mitigation and adaptation
<b>Ecological security</b>	Biosphere	Challenges to equilibrium associated with contemporary political, social and economic structures	People: changing political consciousness	Fundamental reorientation of societal patterns and behavior

Source: McDonald (2013, 49).

Indeed, many discourses on climate change<sup>96</sup> and security are possible (Table 2.1). They can be centered on different conceptualizations of “security,” for example, *climate change as a human security threat* (UNDP 1994; IPCC 2018), *as an international security threat* (UNEP 2011), or *as an ecological security threat* (McDonald 2018). For example, Diez, Lucke, and Wellmann (2016) argue that environmental conflict, as intended by the Toronto School, have as referent object the state, while the term of environmental security usually includes works based on human security, having as referent object the individual or their daily lives, similarly to McDonald’s concept of ecological security. This latter is usually interrelated with a generous debate devoted to *sustainability* and *environmental degradation*<sup>97</sup>. While it is beyond our scope to construct an analysis based on discourses, it is sufficient to note that a realist account focused on state security and adaptation is just one of the many possible alternatives and insights on such a complex issue as climate change, and as such it inevitably overlooks some critical aspects of a problem of worldwide importance.

### 3. The case of climate change in the Arctic

The impacts that climate change has on the Arctic, one of the most exposed regions in the world to global warming (IPCC 2018, 4; Hassol 2004) where climate is consistently changing (Landrum and Holland 2020), constitutes an interesting case worth analysis. This paragraph will demonstrate how the Arctic represents one of the most remarkable examples concerning the shift from geographical constants to environmental dynamics. While the constant nature of the Arctic was a very pillar in Classical Geopolitics (par. 3.1), today the Arctic is one of the most exposed regions to global warming. It is undergoing macroscopic changes (par. 3.2). Because of this reason, it will then be briefly analyzed how IR literature has dealt with the Arctic security environment (par. 3.3).

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<sup>96</sup> Please note that the framework by McDonald (table 1.2) is presented here just for the sake of presenting some possible alternative discourses, but the discourse analysis approach is not applied in this research.

<sup>97</sup> *Environmental degradation* derives from the interaction of economic activity and natural environment, from water and air to agricultural resources, renewable resources such as forests, fisheries, and wildlife and non-renewable such as oils, some metals and minerals (Brander 2007, 7). Environmental degradation has been studied also with respect to developed countries, where the concern over environmental degradation was mainly a product of social mobilization against war and capitalism, from “eco-cide” due to war and weapon tests (Weisberg 1970; Higgins 2013; Foster et al. 2010; Lindgren 2018) - in Vietnam, Cambodia and Laos, or radioactive waste - to environmental pollution coming from industry (Carson 1961). This trend presents typical normative and legal features intertwined with political activism.

### 3.1 The Arctic as a global strategic bulwark

In addressing how Classical Geopolitics has conceived the Arctic, this paragraph will explain how the concept of the “Icy Sea,” which represent a remarkable example of constant and unescapable geographic feature also at the global level, has emerged from the age of explorations, the Columbian era (Mackinder 1904). Indeed, while in the Columbian era it was common opinion the existence of the Open Polar Sea (par. 3.1.1), once the Arctic space had been sketched in its major features thanks to the explorations taking place in the period 1670-1900s, the geopolitical concept of the “Open Polar Sea” was definitely abandoned in front of the real geophysical nature of the Arctic, an ocean covered with floating ice, surrounded by land masses and coastal seas, giving raise to the concept of the Arctic as a global strategic bulwark (par. 3.1.2), with important, although underrated, geostrategic implications for the US (3.1.3).

#### 3.1.1 The Open Polar Sea

If there is a period of specific and evident characteristics in Arctic geopolitics, it is that of the Columbian Era, a concept expressed by Mackinder (1904). In that context (ended in the 1920s), *heroic*, *episodic*, and *individual explorations* characterized Arctic explorations until the Arctic region's major geophysical features were discovered (Table 2.2)<sup>98</sup>. In the countries participating in polar exploration, explorers were generally considered heroic pioneers<sup>99</sup> aiming at the conquest of one of the most adverse zones in the world. Some world-famous national narratives are those centered on Fridtjof Nansen and Roald Amundsen (Norway), Salomon August Andrée (Sweden), and Vilhjalmur Stefansson (Canada).

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<sup>98</sup> The *North Magnetic Pole* is the non-stationary point where the planet's magnetic field points vertically downwards. The discovery was made by the nephew of John Ross, James Clark Ross. The *Geographic North Pole* is the end of the Earth's axis of rotation in the Northern Hemisphere. The ultimate and verified claim of the North Pole was made by the *Norge* expedition under Roald Amundsen, Lincoln Ellsworth (sponsor) and Umberto Nobile (designer and pilot of the *Norge*).

<sup>99</sup> At a first glance, the expression “hero” may sound quite romanticized and inaccurate. However, this is actually a concept widely present in the literature. According to John MacKenzie (1992) the specificities of the hero explorer were the following: the exotic setting (Arctic, Africa), supposed personal qualities and heroic characteristics of the individual (cit.) such as indomitable will, extraordinary energy and action, as well as physical attributes, and, finally, his martyrdom, useful for instrumental purposes to educate youth and society.

**Table 2.2. Final achievements in the discovery of the Western Arctic in 1800-1920s**

Discovery of the North Magnetic Pole	1831	<i>HMS Victory</i> , Great Britain (1829-1833) John Ross
Confirmed existence of the Northwest Passage	1850	<i>HMS Investigator</i> , Great Britain (1850-1854) Robert McClure
Complete ship transit of the Northwest Passage	1903-1906	<i>Gjøa</i> , Norway (1902-1906) Roald Amundsen
Conquest of the Geographic North Pole	1926	<i>Norge</i> airship, Italy/Norway/USA (1926) Roald Amundsen

Source: own elaboration.

Indeed, since the 1850s Polar voyages were hardly made for commercial gains since the possibility of conquering hidden whale fisheries or the Northwest Passage<sup>100</sup> had vanished with previous expeditions (Robinson 2006, 136). Until the key achievements constituted by the (almost) conquest of the North Pole by the *Fram* expedition under Nansen (1893-96) or by the first traversal of the To the observers, the advances in Polar explorations and mapping were extremely remarkable, shaping men's fantasies and adventurous dreams in those territories that were depicted as *mare et terra incognita* as in the iconic world map made by Niccolò Zeno in 1558<sup>101</sup>. Polar voyages' pioneering and heroic features, given both by the public and the rhetoric of the explorers at home (Robison 2006), were the specific characteristics of the era that ended with the old-fashioned conquest of the geographical North Pole by Cook and Peary. With the progress in aerial explorations and the loss of direct contact between the explorer and the wild environment, Polar explorers' heroic narratives were replaced by that of the technological explorer (Cronin 2016). Once Amundsen had

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<sup>100</sup> The Northwest Passage is the sea route that connects the Pacific to the Atlantic through the Arctic Ocean (Baffin Bay, the Canadian Archipelago and Bering Strait). In practice it is made of five recognized sea routes or passages (see Arctic Council 2009, 20). The vertical vector is characterized by zones according to their flora: the High Arctic is permanently frozen, the Low Arctic corresponds to tundra and the Subarctic to the boreal forest.

<sup>101</sup> More precisely, the area of the Atlantic Ocean beyond the south-western coast of Greenland.

accomplished the Northwest Passage sail in 1906, the Arctic remained a battlefield for the rivalries among professional explorers<sup>102</sup>.

As far as the Western Hemisphere is concerned, commerce and explorations in the North were not new to Americans and Europeans. The first period of Arctic exploration was conducted through overland discovery missions in Northern Canada. Two macro-areas can be identified: the Canadian Archipelago and Greenland, part of the *search for a Northwest Passage*, and *Alaska*, a former Russian colony on the American continent. Concerning the Northwest Passage, while indigenous people and Vikings of Scandinavia (who colonized Iceland and then Greenland respectively in the 9<sup>th</sup> century and 10<sup>th</sup> century) were already present in the region, around 1490 Europeans began to investigate the possibility of the existence of a Northwest Passage as a shorter route for trade with the Orient. The first attempt to find the Northwest Passage took place in 1497 when John Cabot sailed from Bristol in an unsuccessful search for the passage; it was followed by the attempts by Martin Frobisher (1576, 1577, 1578), John Davis (who discovered one of the main entrances to the Passage in 1585)<sup>103</sup>, Henry Hudson<sup>104</sup> (1610), William Baffin (1615), and the tragic voyage of Jens Munk in 1619. Alaska was discovered by the Danish Vitus J. Bering: after having been ordered by Peter the Great to sail the Pacific Ocean from Kamchatka to America on the *Gabriel* vessel in July 1728, the Danish explorer tried again to reach the American continent on *Saint Peter* and *Saint Paul* sailing from Petropavlovsk on June 4, 1741. This latter, under the command of Aleksey Chirikov, was the true discoverer of Alaska (Naske and Slotnick 1994, 25-27).

In 1670 the British established the Hudson's Bay Company in North America. Soon, the company became actively engaged both in the search for geographical information (to reach the Pacific Ocean) and economic data on fur trade (Allen 1997, 75). The intensive explorations conducted by the Company until the 1850s were motivated mostly by the possibility of profit (significantly, the Snake River Brigade operating 1822-42). In the end, however, the economic pursue made possible the mapping of the area delimited by the Hudson Bay (east), the Great Lakes (south), the Rockies (west), and the Arctic (north). Large portions in the interior were still unknown, but, according to Allen, "the western and northern interior of Canada was much better known in early 1800 than was the western interior of the United States to the south" (1997, 80), so active was the involvement in the

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<sup>102</sup> In that spirit, in October 1906, after two unsuccessful attempts to reach the North Pole (in 1902 and 1905), Robert Peary wrote that "(...) the North Pole is the last geographical prize which the world has to offer to adventurous man: the prize for which the best men of the strongest, most enlightened, most adventurous nations of the earth have been struggling unsuccessfully for nearly four centuries: the trophy which the grandest nation of them all would be proud to win" (Peary 1906, 43).

<sup>103</sup> Davis Strait.

<sup>104</sup> Hudson Strait and Hudson Bay (Canada).

fur trade in North America. Indeed, the number of Hudson's Bay Company voyages was impressive: from 1670 to 1913, the Company's ships made 600 voyages from London to the trading posts in Hudson Bay (AMSS 2009, 38). Data on whaling activity are impressive as well; whaling resulted in the remarkable accumulation of specialized knowledge of patterns of ice distribution and ship-handling in ice, demonstrated in the 1840s by the establishment of the role of *ice master* or *ice pilot* on the Royal Navy's vessels (usually two seasoned whaling captains). In the period 1610-1915 around 39,251 voyages were accomplished in the Arctic in the pursuit of the bowhead whale in the areas Svalbard/Greenland Sea, Davis Strat/Baffin Bay, Hudson Bay, Bering/Chukchi/Beaufort Seas (AMSS 2009, 39).

Progressively, maritime and overland exploration was carried northernmost, especially by Great Britain. In particular, under Sir John Barrow as Second Secretary to the Admiralty (1816-46), expeditions were significantly sponsored. After the end of the Napoleonic wars, Barrow systematically encouraged and organized expeditions in North America, thanks to the surplus of able officers and seamen after the Napoleonic wars (MacLaren 2013, 19). According to Pierre Berton, there was an officer for every three men in the Royal Navy. In these circumstances, an *Arctic carrier* was the best, if not the only, feasible opportunity of promotion (1988, 18-19). Barrow's expeditions<sup>105</sup> were not limited to the search for the Northwest Passage, but they also aimed at mapping the most northern shores of the American continent. Indeed, a peak in the frequency of explorations was reached in 1850-60; then, after a period of almost stasis, Arctic explorations had a second peak in 1890-1900 (Ross 1997, 327).

The 1850s peak is due to the disappearance of the vessels of John Franklin's expedition, *Erebus* and *Terror*. Nearly a third of all Arctic expeditions were organized to rescue Franklin's lost crew (Ross 1997, 327). Given the international nature of the humanitarian missions and the conspicuous public funding and governmental approval that they received, it is not surprising that American polar explorations began precisely to rescue Franklin. The second period of Arctic explorations (1890-1909), instead, was more variegated since among its objectives, there was also the discovery of new lands and progress in cartographic mapping, and it constituted one-fourth of all Arctic expeditions (Ross 1997, 327).

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<sup>105</sup> The main expeditions planned by Barrow were the following: John Ross (1818, 1821-23, 1824-25), William Edward Parry (1818-19, 1821-23, 1824-25), George Francis Lyon (1824), James Clark Ross (1829-33), George Back (1833-37), John Franklin (1819-22, 1825-27, 1845-47?). For a systematic account of the British search for the Northwest Passage, see Ross (1997).

### 3.1.2 The Icy Sea

In 1904 the Mackinder claimed the end of the Columbian era, or the end of the Age of Discovery<sup>106</sup>: the globe was getting smaller and smaller, and one of the last unexplored zones, the Arctic, was undergoing exploration. In his famous speech to the Royal Geographical Society, the British geographer claimed that “in 400 years the outline of the map of the world has been completed with approximate accuracy, and even in the polar regions the voyages of Nansen and Scott have very narrowly reduced the last possibility of dramatic discoveries” (1904, 421). Arguably, the “closing” trend of political systems was occurring not only at the national level (the American Census Bureau declared the end of the frontier in 1890, for example) but also at the global level, pushing great powers towards resources abroad (Turner 1976; Bordonaro 2012).

An exception was the Arctic. In Western culture, the circumpolar north was more a “frontier rather than homeland: *Ultima Thule*, not *Nunavut*<sup>107</sup>” (Doel *et al.* 2014, 3). The concept was clearly at odds with the well-established scientific theory (and also geopolitical concept) of the “Open Polar Sea” (Kane 1854; Hayes 1867), according to which there was an unfrozen sea belt surrounding the North Pole, separated by the Ice-Belt (Hayes 1867, 2; 351-362)<sup>108</sup>. In the words of Elisha K. Kane,

“[T]he circumpolar ice, as I will venture to name it, may be said to bound an imperfect circle of 6000 miles in circumference with a rude diameter of 2000 miles, and an area, if we admit its continuity to the pole, one third larger than the continent of Europe. But theory has determined that this great surface is not continuous. It is an annulus, a ring surrounding an area of open water—the Polynya, or Iceless Sea. Polynya is a Russian word, signifying an open space; and it is used by the Siberians to indicate the occasional vacancies which occur in a frozen water surface.” (Kane 1854, 544).

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<sup>106</sup> “From the present time forth, in the post-Columbian age, we shall again have to deal with a closed political system, and non the less that it will be one of world-wide scope. Every explosion of social forces, instead of being dissipated in a surrounding circuit of unknown space and barbaric chaos, will be sharply re-echoed from the far side of the globe, and weak elements in the political and economic organism of the world will be shattered in consequence” (Mackinder 1904, 422).

<sup>107</sup> The Inuit word for “homeland”.

<sup>108</sup> Some variants of the theory existed, such as that proposed by August Petermann, who explained the reason for the ice pack on the basis of the meeting of the Kuro Siwo and the Gulf Stream (1852), and sponsored the idea of reaching the North Pole through the Bering Strait (actually, the theory at the basis of *Jeannette* expedition).



It was the explorer's task to break the Ice-Belt surrounding the North Pole, as expressed by Hayes, one of the most engaged explorers engaged in the study of the Open Polar Sea shape (Hayes 1867, 353-362). However, while explorers proceeded in mapping the Canadian Archipelago, its existence and the theory behind it were progressively disproven. To tell the truth, the Open Polar Sea theory was already questioned by experienced whaling seamen, such as William Scoresby (Berton 1988, 24-26) – but he did not represent any institutional position.

Thus, it is no wonder that this geopolitical perspective of the Arctic, derived from the historical context, was incorporated in strategic planning. It should be specified that Mackinder's concept of the Arctic (*Arctic coast, Arctic shore*) does not coincide with today's image of the Arctic as Circumpolar Arctic. On the contrary, it encompassed the Eurasian continent's northern shore, where the Obi, the Yenisei, and the Lena rivers flow, including the sea above the Eurasian continent (*Icy Sea* in the article of 1904). The Arctic was conceptualized into a strategic barrier on a global scale, similar to the Sahara Desert or the Hindu Kush: in Mackinder's work (1904), the Far North was conceived as the iced boundary that made the Pivot Area totally inaccessible by north, and later (1943) it was made part of the natural bulwark which provided an ultimate defense to the Soviet Union, together with the Lenaland and the mountain belt from the Altai to the Iranian desert. According to Mackinder, that role was not going to be substantially challenged by technological improvement:

“[I]t is true that the Arctic shore is no longer inaccessible in the absolute sense that held until a few years ago. Convoys of merchant ships, assisted by powerful icebreakers and with airplanes reconnoitring ahead for water lanes through the ice pack, have traded to the Obi and Yenisei River; but a hostile invasion across the vast are circum-polar ice and over the Tundra mosses and Targa forests of Northern Siberia seems almost impossible in the face of Soviet land-based air defense” (1943, 600).

By reading Mackinder's works, the Icy Sea as a strategic concept emerges only marginally, and it is not clear whether it was conceptualized as a strategic concept *per se* or only as a geographically remote area of the Heartland. While the “Arctic coast” is manifestly part of the Heartland (1943, 597), there is some inconsistency concerning the Polar Ocean<sup>109</sup>. According to Mackinder's last work, it is still supposed to constitute part of its natural bulwarks, defined as the “girdle of broad natural defenses – ice-clad Polar Sea, forested and rugged Lenaland, and Central Asiatic mountain and arid tableland” (1943, 603). Moreover, the extent of the Icy Sea is not defined. This is in striking contrast with Mackinder's detailed geographical culture, evident in his masterpiece works. However, regarding the 1904 version

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<sup>109</sup> The Arctic Ocean is the smallest ocean, lying within the Arctic Circle, and centered on the Pole. It has some marginal seas (Chuckchi, East Siberian, Laptev, Kara, Barents, White, Greenland, Beaufort).

of the theory, this is arguably because at that time the Polar Ocean was almost unexplored; in the 1943 article, as we have seen, Mackinder proposed a “conventional,” but modernized, interpretation compared to “progressive” approaches to the Arctic giving importance to technological improvement.

Despite Mackinder’s strategic concept, the power of technology should not be overestimated. Iconically, in 1910 the famous American-Canadian explorer and anthropologist Vilhjalmur Stefansson discovered the existence of the “blond Eskimos” (or “copper inuits”) in Northern Canada, who had never seen a white man before his arrival; still today, vast parts of the Arctic are not mapped (Arctic Council 2009, 20). During the Columbian age, the Arctic enjoyed an appealing attraction for explorers, an impression magnified by one of the most tragic expeditions ever conducted in the Arctic, Sir Franklin’s voyage. The memory of the disappearance of Franklin’s expedition in 1848<sup>110</sup>, aiming at conquering the last unexplored section of the Northwest Passage<sup>111</sup>, shaped English, American, and Canadian governments’ attempts to find the rests of Franklin’s two vessels, an effort involving not only governments but also companies such as Shell Canada (Dodds and Nuttall 2016, xi). The fate of Franklin’s expedition has been shrouded by mystery until September 2014, when a Canadian team discovered the wreck of HMS *Terror* in Queen Maud Gulf; two years later, in September 2016, a Canadian private foundation found the wreck of HMS *Erebus* south of King William Island. The discovery exposed the tragic fate of the crew, showing proves of pneumonia, poisoning due to lead exposure, and cannibalism.

While the first systematic measurements of weather, ice, and water were made during the first International Polar Year in 1883-1884, followed by the extensive geological mapping of East Greenland conducted during the Geological Survey of Greenland in 1926. However, large areas of the Arctic were still far from being mapped or explored. The positivistic optimism that motivated scientific research in stations settled mostly on Cumberland Sound and Hudson Strait and Bay (Ross 1997, 311) regarded territories already known because of the whaling activity that was practiced there for a long time. While good results were obtained in this region, northern voyages were still tragic, as proven by Greely’s expedition, which was planned for the International Polar Year (IPY) itself.

In Mackinder’s map in “The Geographical Pivot of History” (1904), the Icy Sea seems to extend from the Scandinavian Peninsula to the Čukotka Peninsula. Thus, it is an entirely Eurasian concept: the American Arctic is completely excluded from Mackinder’s Arctic, being

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<sup>110</sup> The English Captain Sir John Franklin was the leader of a British expedition to the Arctic which took place in 1845. He left aboard two HMSs, *Terror* and *Erebus*. The expedition’s journey included Lancaster Sound, the Barrow Strait and Cornwallis Island. The two vessels disappeared in 1846 “somewhere north-west of King William Island” (Dodds and Nuttall 2016, viii-ix).

<sup>111</sup> The area south of Parry Channel, as a gateway to the Pacific.

part of the Outer Crescent<sup>112</sup>. This does not prevent us from assessing the most evident and important conclusion from Mackinder's analysis on the strategic value of the Arctic: the geographical belt constituted by the "girdle of broad natural defenses – ice-clad Polar Sea, forested and rugged Lenaland, and Central Asiatic mountain and arid tableland" (Mackinder 1943, 603) which for a considerable time-constrained Russian naval strategy. Under Nicholas II, the Imperial Russian Navy was still divided into two non-communicating fleets: the Pacific fleet (Vladivostok) and the Baltic fleet (Kaliningrad). This circumstance severely hampered Russian logistics. A case was the journey of the Baltic fleet squadron under Adm. Zinovy Rozenhenstenckij, which circumnavigated Eurasia and Africa to provide support to the Pacific fleet engaged in the Russo-Japanese war (1904-1905), and was eventually defeated in the battle of Tsushima (Douhet 1933).

Posing so extreme a constraint on power projection from both sides, the absolute impossibility to trespass the circumpolar zone with the purpose of invasion or to install land-based air defense on the Arctic shore (Mackinder 1943, 600) laid one of the central concepts for the American containment strategy during the Cold War: the military impenetrability of the Eurasian continent for insular powers (Brzezinski 1986, 1997; Cohen 1963; Collins 1986; Gray 1977). It is not surprising, thus, that instead of developing a "full" polar strategy, US grand strategy opted for a perimeter strategy of containment (Petersen 2011, 90) along the Rimland, i.e., the Middle East, South-East Asia, China, and Europe (Gaddis 1982).

### **3.1.3 The American Buffer Zone**

The concept of the Arctic as a global strategic bulwark had notable implications on US geostrategy as well. The North Pole was considered the least important ocean (1944, 24) and not a "zone of power" by Nicholas J. Spykman (1944, 28), neither actual nor potential, because of the impossibility of cultivation (similarly to tropical zones) and of the presence of ice that obstructed commercial navigation, except for some ports - Murmansk, ice-free all year, and Archangel, gridlocked for three-four month per year (Spykman 1944, 21). It is worth noting that both Spykman and Mackinder envisaged the possibility for icebreakers or cargos to make way through the Pole (Mackinder 1943, 600; Spykman 1944 57), but in both visions, technological progress was circumscribed to limited civilian purposes because of the ultimate impossibility of establishing solid commercial or military bases around the Pole.

In this regard, "America's Strategy in World Politics," a well-known essay by Spykman circulating during the last years of World War II, presents an interesting definition of what Spykman defines "the North American Buffer Zone," one of the six zones in which the

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<sup>112</sup> The Outer or Insular Crescent, constituted by Britain, South Africa, Australia, the United States, Canada and Japan, is the maritime "world" (Mackinder 1904).

Western Hemisphere is divided (1942, 399) according to their “degree of exposure to overseas attack”<sup>113</sup> (1942, 399):

“[T]he most northern strategic zone of the hemisphere is the broad belt that stretches from the Bering Strait to eastern Greenland and from the Pacific outposts in the Aleutian Islands to the Atlantic outposts in Iceland. It contains not only the long Arctic front but also the northern sections of the Pacific and the Atlantic fronts. In terms of approaches from Asia and Europe it functions as an enormous buffer zone between the Arctic and the fiftieth parallel which passes through British Columbia in the west and Newfoundland in the east.” (Spykman 1942, 399).

This buffer zone, according to Spykman, far from containing war potential or inherent strength, was nevertheless “extremely important because of its strategic location” (1942, 399): a very gate to the continental area lying south, were lied the centers of productive national economy in terms of agriculture and industry (1942, 400).

However, because of climate, only two (minor) naval or air approaches were possible. One was from the North Pacific and the other from the North Atlantic. The most significant zones for strategic analysis “were the coastal regions between the Alaskan Peninsula and Prince Rupert Island and between Iceland and Newfoundland” (1942, 400) thanks to warm currents that benefited them (the Aleutian Islands, Alaskan Peninsula by the Japan Current, and southwestern Greenland and Iceland by the Gulf Stream). Concerning hemisphere defense in case of an invasion coming from the Pacific Ocean at northern latitudes, Spykman underlined the importance of the Aleutian Islands, favored in climate by the Japan Current for their ice-free harbors and presenting “innumerable sheltered harbors and inlets which in enemy hands might serve as advance bases for an attack on the American mainland” (Spykman 1942, 414). At the same time, the harsh arctic climate posed difficult conditions in terms of “rough seas and cold bleak fogs” (1942, 414).

Both opportunity and disadvantage emerge in Spykman’s analysis. The North American Buffer Zone protects the US territory (except for the vulnerable Alaska) because of its geographical location and climate, granting thus a massive advantage in terms of continental depth in case of aggression coming from North-East (Japan) or North-West (Soviet Union/Russia). But in the end, the Buffer Zone's geographical configuration is two-folded: it has a valuable strategic advantage for continental defense, but because of the same geographical constraints, it precludes both civilian build-up and military aggression from abroad. Another double-folded issue emerges from the period between the end of World War II and the beginning of the Cold War: if on the one hand, the transpolar region was crucial for power projection towards enemies’ territory (such as Japan or the Soviet Union), on the

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<sup>113</sup> In total they are: the North American Buffer Zone, the North American Continental Zone, the American Mediterranean, the West Coast of South America, the South American Buffer Zone, the South American Equidistant Zone (Spykman 1942, 399).

other it was also a formidable gate to the American continent, which made the United States exposed to a direct threat to its territory. Indeed, the importance of the Arctic as a gateway was a hot topic after the end of World War II, underlined in particular by military observers also in front of public opinion (Arnold 1946; Spaatz 1945); “The chief strategic importance of the Arctic area,” asserted the Joint War Plans Committee in November 1946, “derives from the fact that it comprises the most direct route between North America and the USSR” (cit. in Martin-Nielsen 2018, 70). Air Force Lieutenant Colonel Emil Beaudry wrote in a secret 1949 report that polar regions are “a likely avenue of approach for untold destruction” and that “unless guarded could well spell doom to the United States as a nation” (cit. in Martin-Nielsen 2018, 70).

In 1942, Spykman offered a similar reflection. To grant defense in depth in favor of the actual geopolitical pivot of the country, the North American Continental Zone, in case of complete encirclement, the North American Buffer Zone was to be sacrificed:

“(…) [it] would be inevitably be lost and the Aleutian-Alaskan outpost in the northwest and the Iceland-Greenland position in the northeast would have to be sacrificed. The former could be taken by the Japanese without too great an effort and the latter by the Germans with comparative ease” (1942, 443).

A precondition for this is a dramatic situation of complete encirclement, where the forward-deployed bases were conquered by enemies, starting from the territories which were closest to them. The consequences would have been dramatic also at the global level:

“[A]fter the conquest of the Russian Maritime Provinces and Eastern Siberia, the Nipponese would have all the advantages of proximity in military operations in the contact area between the Polar and the Pacific fronts. The same would apply to the Germans in the contact zone between the Polar and the Atlantic fronts. After the conquest of Great Britain, the position of Iceland close to Scotland and Norway would be untenable and the same would apply to Northern Greenland. The defeat of our allies across the oceans would bring out northern defense line down to the inner belt of the buffer zone from Prince Rupert Island to Newfoundland” (Spykman 1942, 443).

### **3.2 Climate change in the Arctic**

Today, the physical geography of the Arctic is changing at a rate of change even more evident than in other regions. Indeed, the warming experienced in the Arctic region is two to three times higher than the global annual (IPCC 2018, 6; AMAP 2019, 4) due to its closed sea

nature and its high albedo<sup>114</sup>. This causes, broadly speaking, the decreasing of arctic sea-ice extent, the warming and desalinization of the sea, as well as the acidification of the ocean. Warming also affects land areas, and permafrost is reducing as average temperatures are increasing.

Those changes are having remarkable effects on human activity. With more open water, the Arctic will become *more habitable*, and *new sea routes* are being opened by states having traditional interests in the area (namely Russia, United States, Canada, Denmark, Finland, Norway, Sweden) and by new actors progressively participating in the region, such as China, Japan, India, or the European Union. To cite a few, the (partial) opening of the Northwest Passage was certified by the European Space Agency (ESA) in September 2007: the melting of arctic ice will make it possible for ships to sail 4,000 miles from Asia to Europe through America, and vice versa, avoiding the Panama Channel (ESA 2007). The Northeast Passage, which includes the Northern Sea Route whose all-year ice-covered parts were once navigable only by ice-breakers, is becoming more and more ice-free (National Ice Center 2011). Not only new trade opportunities may be available, but also *resource extraction* will be fostered by the changing climate.

### 3.3 Climate change in the Arctic in IR literature

IR has not neglected the impacts of climate change on the Arctic region. Reflecting a general trend in the literature, during the 2000s Arctic literature experienced the abandoning of the geostrategic perspective and gained a new emphasis on the challenge emerged from climate change or a more general environmental cooperation had on international governance. The living interest for such a topic cannot be disclaimed. While the end of the Cold War seemed to inaugurate a period of totally new relations in the Arctic, IR scholars and public opinion have been questioning why since 2007-2008 conflict has returned to play a prominent role in both the political and academic debate and some militarization patterns have become increasingly evident in the case of various Arctic states, especially Russia and Norway; or which could be the impacts of melting ice on Arctic indigenous communities and coastal communities worldwide.

The alternation of conflict and cooperation is a recurrent *topos* in the case of the Arctic. This Arctic-specific mix of conflict and cooperation has been referred to as “amplification” of drivers of scramble by Dodds and Nuttall (2016, 53-56). Indeed, due to its unique geographical and symbolic features, the Arctic has intermittently appeared in past and current political and academic debate, fostering each time enthusiasm for totally new opportunities as well as concerns about conflict, militarization, and spill-over effects. On the one hand, Institutionalism and Constructivism are still focused on the positive effects of institutions even on challenges derived from climate change, such as the emerging of resources (par. 3.3.1). On the other hand, envisaging dramatic geopolitical scenarios in a

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<sup>114</sup> For a general overview of Arctic ice and temperature conditions, please consult data from National Snow and Data Center at: <http://nsidc.org/arcticseaicenews/>

seasonally ice-free Arctic in 2040-the 50s, public opinion and governments focussed mostly on a new edition of the Gold Rush - the Arctic Rush – which apparently surpassed the exceptionally well-established cooperative climate of Arctic relationships: such aspects have been the object of Neo-Realist research (par. 3.3.2). Those insights in literature, however, do usually forget to address the impacts that climate change has on territorial integrity (par. 3.3.3).

### 3.3.1 Arctic exceptionalism: governance and cooperation

The institutional and constructivist perspectives see the opening of the Arctic space as a place for opportunities and challenges, not only in terms of material capabilities (mostly energy resources and raw materials). *Challenges* are due to competing interests in the region hold by states and subnational groups as well. Still, the opportunity is given by market benefits, such as employment for individuals, investments for businesses and consequent national tax revenues, and in general by the opportunity “to manage a sizable proportion of the globe in a peaceful manner that makes it possible to experiment with new approaches to environmental governance” (Young 2009, 425).

While these issues are debated mostly by institutionalists (Keil 2015), the *novelty* of the Arctic as an entirely new category of a region dominated by peace and cooperative relations managed by institutions (so-called “Arctic exceptionalism,” a concept that emerged from the Murmansk Initiative in 1987) is the central focus of the constructivist approach as well, where the emphasis on the role played by institutions gives way to the re-imagination of traditional state patterns (Knecht and Keil 2017). As a new typology of region (Keskitalo 2007), the Arctic’s first macroscopic peculiarity is of being composed of a plurality of countries’ remote peripheries, called by Heininen and Nicol (2007) “the Circumpolar North.” Such peripheries are tied by an ongoing spatialization made possible by key regional *institutions*, firstly the Arctic Council (Heininen and Nicol 2007, 136). What came after the era of *Realpolitik*, stemming out from the Gorbachev Initiative, was thus defined as “Arctic exceptionalism” or “New Arctic,” a period of the “recent era in circumpolar history set in motion by an unparalleled confluence of political and natural phenomena” (Doel *et al.* 2014, 2), characterized by “geo-economic thinking based on global concerns” (Doel *et al.* 2014, 3). In this new panorama, climate change constituted a (positive) challenge, a very stimulus to multilateral cooperation.

First and foremost, institutions permitting multilevel cooperation created the Arctic region in its physical sense as a coherent space by itself. Far from being the heavily militarized chessboard of the Cold War, with missile defense installations and submarines beneath the icecap, institutions have created a totally new geopolitical discourse, establishing a common understanding of the Arctic region based on highly specific ecosystem’s characteristics (e.g., average seasonal temperature, distribution of permafrost, vegetation and marine boundaries) and not on state boundaries. In the end, this definition (AMAP 1998) ended up being effectively interiorized by institutions’ members, states, and shared understanding. Then, Arctic institutional quality is noticeable since the Arctic “laboratory” made it possible for *international arrangements* to be far more effective than usual in international relations

(especially in solving specific Arctic-related issues), despite the non-binding nature of the agreements and its soft power basis. Indeed, the effectiveness of the Arctic model managed to resist and address even external environmental change and impacts of globalization, as argued by Oran Young (2005, 14). Thus, according to the most optimistic view, the Arctic model, whose effectiveness has also been proved by this kind of stresses, may be implemented in other regions as an effective solution – a solution particularly suited to a world dominated by uncertainty and interdependence.

Arctic cooperation and the active role of multilevel institutions in Arctic politics are supposed to effectively temper states' propensity for militarization. Arctic institutions connect northern societies and subnational groups (indigenous peoples, research institutes) to international forums within an effective governance model. Indeed, Arctic governance is shaped by international agreements (the Arctic Environmental Protection Strategy), international forums (Arctic Council, Northern Forum, Conference of Parliamentarians of the Arctic Region), nongovernmental arrangements addressing specific Arctic issues such as scientific cooperation (International Arctic Science Committee), and nuclear safety (Stokke 2011). Institutions clarify rules and enforcement competence on the use of resources and sea routes and also prevent international disagreement from emerging (Stokke 2014). They are also virtually able to provide the governance framework for the transition imposed by global warming in the region, as proven by the case of the Polar Code revision under the International Maritime Organization (Hilde 2014).

The emergence of *norms* also has a pivotal role in transforming the Arctic from a space of strategic confrontation to a space of cooperation. Norms are effectively pursued through institutions, as in Young's model of Arctic stewardship (2012). The model requires the identification of stakeholders' identity and potential harms, feasible road maps for cooperation, and "the establishment of mechanisms designed to administer these remedies in a manner that the Arctic residents regard as legitimate" (2012, 418). Stewardship includes not only traditional issues of governance, but also, remarkably, specific policies towards the respect of the natural environment. As underlined by Griffiths (2011):

"[A]t the heart of Arctic stewardship lies the governance of a region in which interaction between states and their physical milieu, and between the states themselves, cannot be left to evolve at will without avoidable deprivation to milieu and human alike" (Griffith 2011, 7).

Indeed, one of the achievements of the Circumpolar North's governance is the bypassing of traditional state security towards the complete inclusion of human security and sustainable development in the multigovernmental agenda (Heininen and Nicol 2007).

### **3.3.2 Anarchy in the Arctic: conflict and zero-sum game**

On the other side, the neo-realist school finds in the Arctic Mediterranean - a recurrent concept in neo-realist Arctic literature (Zellen 2009) - the same fundamental features of the international arena: the Arctic is thus an *anarchical space*, particularly



attractive to states because of its *resources*, to be conquered through active participation in a zero-sum game (Borgerson 2008; Kraska 2014; Zellen 2009; Anderson 2009; Emmerson 2010). Neo-realists contend the optimistic vision on Arctic cooperation of liberals, institutionalists, and constructivists, as well as its unique nature. Indeed, the increasing accessibility of the Arctic is now triggering a modern “Gold Rush” (Howard 2009) and a “Scramble for the Arctic” (Sale and Potapov 2010), reminding the past: the Yukon Gold Rush in the late 1890s which saw thousands of hopeful fortune-seekers scrambling up and along the Chilkoot Pass and the impervious routes along the Klondike. In the absence of a legal framework governing the Arctic, neorealists commonly argue that the whole issue of the melting Arctic is far beyond the UNCLOS purposes, that “the Arctic countries are likely to unilaterally grab as much territory as possible and exert sovereign control over opening sea-lanes wherever they can” (Borgerson 2008, accessed online).

### 3.3.3 Assessing the Arctic security environment

It is out of contention that the melting ice is creating a more hospitable place for people, especially for those engaging in resource extraction, and a passageway for international trade. A so far unexperienced degree of cooperation is a peculiarity of the Arctic region. While the degree of effectiveness of international agreements and shared norms can be questioned (Dodds 2010), it is also true that conflict which inevitably permeates the region will very unlikely degenerate into a new Cold War. Rather, it is agreed that security concerns are focused “on pre-empting any *potential* conflict through the many existing venues of cooperation, governance structures, and legal regimes” (Bruun and Medby 2014, 917). According to others (Hilde 2014), Arctic relations are not about conflict but are undergoing a period of military modernization and limited expansion, particularly evident in the case of Russia or Norway. The reasons for this are to be found in specific regional security dynamics. Instead of being driven by climate change, they are focused on societal concerns, such as human and environmental safety, and not state security (Hilde 2014). According to Hilde (2014, 160-161), the only case in which conflict could spread in the region would be the eventual case of a spill-over from conflicts taking place in other theatres – an option taken into consideration in the case of the Georgian war.

In the analysis made by Dodds and Nuttall (2016), six drivers of scramble, driving the “making and remaking” process of the Arctic (Dodds and Nuttall 2016, 31), are identified. The first one is *globalization*. It is true that the Arctic, far from being excluded in global events, has been tied to the global economy since fur trade was documented in the 9<sup>th</sup> century. Indeed, fur trade brought into contact northern peoples with Egyptians and Chinese (16<sup>th</sup> century), and trade routes were established from Greenland and Scandinavia to Spain and North Africa. The second driver is the *securitization* of living and non-living resources in the region (continental shelves, air space, infrastructure for resource extraction), a pattern evidently at the center of neo-realist literature on the Arctic. The third driver, *legalization*, is widely discussed in the literature about territorial claims and disputes in the region, analyzing national and international legal regimes. The fourth driver, *polarization*, indicates “the growing activism of indigenous peoples and circumpolar cooperation in the Arctic, involving

subnational governments and regional organizations and, on the other hand, the expanding interest of extraterritorial actors such as the European Union” (Dodds and Nuttall 2016, 47); it is another well-established, topic in the stewardship literature. The last two drivers are the most useful for this analysis. *Perturbation* refers to the effects of global warming, exacerbated by feedback mechanisms acting in the Arctic. *Amplification*, the last driver indicates a sense of magnification and amplification of various issues, stresses, impacts, and transformations, also in a geophysical sense (the change in net radiation balance, at twice as the global average, or the thinning of residual ice cover alongside a decline of overall sea ice extent contributes to some positive feedback). Amplification fosters both neo-liberal fantasies (a world without ice, new shipping routes, new possibilities for extraction) and fear (uncertainty, displeasure).

As it was seen, the first debate that emerged concerning Arctic security was the creation of cooperative relations in the region. Today, the fact that military build-up is not competitively taking place is testified by impartial actors toning down extreme positions (Wezeman 2016). In this regard, Franklyn Griffith points out that the Ilulissat Declaration did not address neither arms control nor the weaponization of space or missile defense and that this may imply “no expectation of war in the Arctic” (Griffith 2011, 5). However, he ends by noting that “silence on Arctic arms control owes more to convention than to conviction” (Griffith 2011, 5) since states, owing to the idea of the Arctic as a cooperative *milieu*, used to address such issues in other forums, external to Arctic governance. In this perspective, the “way to security in the Arctic” (Griffiths 2011, 19) is not a traditionally binary one, but an indirect one, mixing both stewardship and possession goals. After apprehension spread by the Russian demonstration of the flag on the North Pole and the consequent explosion of the neo-realist literature on security implications of climate change took place (the main neo-realist article, written by Borgerson, was published in 2008), the Ilulissat Declaration in 2008 proved to be a full success of the ability of the international community to maintain peace and cooperation in the region. Moreover, as noted also by Byers (2017), Arctic cooperation survived also the 2008 invasion of Georgia, as proved, for example, by the adoption of the Arctic Marine Shipping Assessment<sup>115</sup> by both US and Russia in 2009 (Byers 2017, 384). Almost surprisingly, cooperation did not dramatically suffer even from the 2014 Russian annexation of Crimea.

However, while the main agreements shaping the Arctic legal framework (i.e., the Ottawa Declaration, the Ilulissat Declaration) do not deal with military affairs, it is a matter of fact that defense documents of many Arctic powers are still dealing with the consequences that the Arctic race, magnified by climate change, is having on national security. While after the Georgian and Ukrainian crisis military cooperation was suspended from both sides and

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<sup>115</sup> The study was made by nearly two hundred experts under the Arctic Council’s working group Protection of the Arctic Marine Environment. It is an assessment of current and future Arctic marine activity with a focus on Arctic marine safety and environmental protection. Together with UNCLOS it provides the fundamental legal framework for governance of Arctic marine navigation. It does not address directly security issues.

military build-up enforced, these days Arctic relations still display a mix of cooperation and conflict that fits more Nye's concept of "complex interdependence," as argued by Byers (2017), than a full-fledged scramble for the Arctic: while military and economic cooperation may be suspended, other forms of regional cooperation, namely search-and-rescue, freedom of navigation, fisheries, and territorial disputes are still efficiently managed.

It was argued at the beginning of the chapter that one of the most evident and worrisome effects of climate change was that of jeopardizing the territorial integrity of states. Concerning the Arctic, one of the most exposed regions to climate change, literature has developed mostly along with the cooperation-conflict debate, and in the end, especially in the years characterized by the revival of military activity in the Arctic, a clear-cut position of the predominance of cooperation or conflict is quite difficult to be achieved. Impacts on territorial integrity, then, are not a central issue in contemporary Arctic studies. Thus, the next paragraph will return to the question from which the chapter has moved, namely the issue of the impacts of climate change on territorial integrity.

#### **4. Research design: the case of climate change impacts on US homeland defense in the Arctic**

At this point, it will be presented the empirical case which will be developed in the following empirical part of the research. The choice for an empirical case lies in the necessity of providing empirical evidence for the theoretical argument developed at the beginning of the chapter, which argues that climate change impacts on territorial integrity can undermine the relative power of states and that this fact can be addressed by the actors involved in the adaptation process according to various degrees of awareness. In this paragraph there will be explained the reasons for the choice of the US (par. 4.1), the purposes of the research and how they fit the analytical framework (par. 4.2), and the method adopted (par. 4.3).

##### **4.1 Climate change in the North American Arctic**

The choice of the US case, as it will be seen, moves from the fact that in the US case, that is evident how, from a geostrategic point of view, climate change has changed the Arctic from constituting a strategic bulwark granting continental defense to undermine the very territorial integrity of the state<sup>116</sup>. Thus, it will be presented how climate change can undermine the American territorial integrity, a very different condition than the American Buffer Zone (par. 4.1.1). Then, it will be selected the geographical area under investigation (par. 4.1.2), and there will be outlined the core concepts, the actors, and the method applied to the analysis (par. 4.1.3).

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<sup>116</sup> As it will be explained in Chapter III.

#### 4.1.1 The empirical puzzle on climate change impacts on US territorial integrity in the Arctic

While science, public opinion, and international politics were already coping with the containment of emissions and international climate politics during the 1950-60s, climate change's impacts on national security were incorporated into security planning only after the end of the Cold War, especially in the case of the US. Apart from the possibility of direct conflict taking place in the Arctic, there is another issue strictly explicitly related to US national security: that of insularity and security borders, which once were granted by the ice cap, and then challenged by technology, air power, and missile technology - especially in time of war. Since national security is still a core feature of the international system, the northern defense should still be a national priority for the US. Based on what has been said throughout this chapter, climate change in the Arctic is potentially making the US even more exposed than during World War II and the Cold War.

Some years ago, the impenetrability of the Heartland Northern barrier was questioned by Christopher Fettweis (2000) on the basis of the obsolescence of Classical Geopolitical concepts due to technological progress, but in the final analysis, one of the most evident issues directly affecting security in the North American Arctic is the melting of Arctic sea-ice. Today, with the ongoing collapse of the Arctic gatekeep, US insularity may be physically at stake, and paradoxically even more than during the Cold War. However, being still the US the only superpower in the international system, it is clearly unchallenged by peer adversaries such as the Soviet Union. Not surprisingly, the issue of the American northern vulnerability is not currently contemplated by the US with the same emphasis as before. This partially explains why after the Cold War scholars' debate proposed a totally new vision of the Arctic space: that of a laboratory of cooperative liberal politics, unexperienced in other world regions still affected by "great power games."

The very fact that the Arctic geography is changing, and the fact that this change can undermine US territorial integrity and consequently its power projection, is not necessarily perceived by the actors involved in national security planning in the Arctic<sup>117</sup>. Moreover, geographical facts do not dictate predetermined outcomes according to the probabilistic approach adopted by this research, it would be impossible to state objectively whether American insularity is failing. But *how is the US adapting to the impacts of climate change on its territorial integrity (homeland defense) in the Arctic?* This specific question sheds some light on the more general issue *of the relevance of geography on national security*, and in particular on the relevance of changes in physical geography (in this case, climate change). To assess this, it will be necessary to highlight the causes underpinning the eventual process of adaptation and how adaptation has unfolded.

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<sup>117</sup> See par. 2.2.

#### 4.1.2 Selecting the geographical setting: the North American Arctic

A first and foremost analysis should address *what the Arctic is*. Disagreement and confusion are typical in the Arctic literature, due to its relatively recent origin and to the limited attention devoted to the topic. This paragraph aims to clarify some basic concepts on Arctic's definitions and explain the definitions that will be used in the research.

Since the revival of "Arctic politics" around 2007, recent trends in public opinion debate and politics have brought back the narrative of the Arctic as a key component for its very definition, no more restricted to functional military-operational definitions typical of Bipolarism. Moreover, Arctic narratives supersede geographical definitions which are the basis of the Arctic international law regime<sup>118</sup>: instead of displaying specific geographical requirements, Arctic narratives include geographies derived from historical memories, ranging from indigenous peoples' memories to broad and more flexible concepts (both geographically and conceptually) such as "the High Arctic," "the Far North," "the High North" or the "Circumpolar Arctic" (Tamnes and Offerdal 2014, 4-5)<sup>119</sup>.

It goes without saying that definitions based on narratives are close to a specific *geopolitics* in the sense expressed by Critical Geopolitics<sup>120</sup> (Agnew and Ó Tuathail 1992; Ó Tuathail 1996), as they indicate some "particular tradition of thinking about international politics" (Ó Tuathail 1996, 61) rather than being Cartesian geopolitical concepts. From the perspective of Critical Geopolitics, it can be evocatively stated that definitions based on narratives do reveal "an unquestioned and unproblematized geographical politics at work in the scripting of the dramas of the global political stage" (Ó Tuathail 1996, 62) such as the

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<sup>118</sup> For example, the Illulissat Declaration in May 2008 established the Arctic Ocean coastal states as "Arctic states", holders of functional rights and duties with respect to the region, known as the "Arctic Five" (Canada, Denmark/Faroe Islands/Greenland, US, Russia, Norway). It is worth noting that even though the Arctic Council's governance was originally enlarged to states with no frontage on the Arctic Ocean (Finland, Sweden and Iceland, the "Arctic Eight"), the main initiative addressing Arctic governance in the "era" of climate change, the Illulissat Declaration, was achieved beyond the framework of the Arctic Council and signed only by the Arctic Five.

<sup>119</sup> For example, the Norwegian government is now using the term "High North" in international politics to define European (and Russian) territories and areas of influence in the Arctic. The term was introduced for the first time in 1986 by a Norwegian diplomat, but its use in formal state documents stepped up since 2003 (Skagestad 2010) and notably in 2006 Norway delivered in Tromsø its "High North Strategy".

<sup>120</sup> It should be noted that the whole debate over Arctic definitions (narrative, geographical, functional) can be read in the light of Critical Geopolitics. For instance, even definitions based on geography are far from being objective representations of reality: one can argue that the fact of drawing specific geophysical boundaries is an attempt to create an international sense of the Arctic encompassing states' boundaries. Here, for the sake of simplicity, the critical reading is limited to definitions based on narratives, as their multiple meanings are most emblematic of the critical approach.

search for prestige, great power politics, national identity, or the creation of international norms. It follows that definitions based on selected narratives are usually employed for political aims not only by states but also by international organizations and sub-national actors. Indeed, those are forms of *geo-politics* (namely, specific scripts of global space by competing authorities) instead of *geopolitics*<sup>121</sup>. This also implies that there is inherent confusion on the actual boundaries of narrative definitions. Paradoxically, the same words (e.g., the European North, the High North) could indicate different regional concepts and shapes. A case in point is the use of the expression “Circumpolar North” in the literature, used interchangeably or having different and often non-specified meanings.

Today, with the spread of narrative definitions in politics and academic research, even territorial disputes, by definition based on specific claims, are usually embedded in the rhetoric of national identity claims over territories historically tied or instrumental to national cultural heritage and politics<sup>122</sup>. According to this perspective, the identification of the key actors involved in Arctic international relations can rightfully extend to actors totally new to classical Arctic rush, not only coastal states (USA, Russia, Norway, Canada, Denmark) - traditional players of Arctic explorations and rivalries - but also China, Japan, Singapore, India, South Korea, or the European Union.

On the other hand, the word “Arctic” is usually intended for a specific geographical region with some peculiar geophysical characteristic. Definitions based on geography are mostly adopted by international institutions. There are several definitions, but all of them comprehend the area north of the Arctic Circle (66°33’ in 2019)<sup>123</sup>. Substantial differences arise when assessing the southern border of the region. The geographical definition adopted by the Arctic Monitoring and Assessment Programme (AMAP), one of the six working groups of the Arctic Council, is now widely used, and it is consistent with the common idea of the *Circumpolar North/Arctic*:

“AMAP has established a circumpolar region as a focus for its assessment activities that includes both High Arctic and sub-Arctic regions. In the

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<sup>121</sup> According to Ó Tuathail (1996), “Geopolitics”, as opposed to “Critical Geopolitics”, indicates the imperialist, neo-Lamarckian and Cartesian discipline from Mahan to Haushofer.

<sup>122</sup> A particular case is China’s Arctic Policy. The People’s Republic of China published its Arctic Policy in January 2018, formally addressing challenges and opportunities derived from global warming in the region. According to China’s Arctic Policy, China’s self-definition is “Near-Arctic State” (“one of the continental States that are closest to the Arctic Circle”), a totally new definition in Arctic international politics. Iconically, China operates the world’s largest nonnuclear icebreaker, Snow Dragon (*Xue Long*). Among Chinese projects in the Arctic there is the Polar Silk Road. China’s Arctic Policy can be read at this link: ([http://english.gov.cn/archive/white\\_paper/2018/01/26/content\\_281476026660336.htm](http://english.gov.cn/archive/white_paper/2018/01/26/content_281476026660336.htm)).

<sup>123</sup> The Arctic Circle is the parallel where the sun does not set on June 21 (summer solstice) and does not rise on December 21 (winter solstice).

marine environment, the 'AMAP area' includes northern seas that extend as far south as 51.1 degrees N (James Bay, Canada)"<sup>124</sup>.

Though the AMAP utilizes different definitions for the purposes of its analysis, it should be noted that drawing different geographical-functional boundaries according to the specific characteristic to be measured (pollution, marine environment, biodiversity, ocean acidification, etc.), excluding the case of an absolute biogeographical definition. Other examples of biogeographical definitions are less straightforward for those who are not accustomed to science. For example, adopting a climatic definition usually means defining the Arctic as the region north of the 10°C isotherm<sup>125</sup>. Other definitions can be based on astronomical characteristics: the southern boundary of the Arctic can be established according to "the latitude beyond which the sun does not set a high summer, or rise during the depths of winter" (Dodds and Nuttall 2016, 6). For an oceanographer, the Arctic may be "where ocean temperature remains near the freezing point of salt water and its content about 32 parts per thousand" (Dodds and Nuttall 2016, 6). Finally, for a terrestrial ecologist, the limit may be drawn along the tree line, that is, the point beyond which trees cannot grow, separating tundra and taiga<sup>126</sup>.

The typology of functional definitions is more flexible and can serve broader analytical purposes. Indeed, as stated by Tamnes and Offerdal, "functional definitions spring from usage of the region rather than specific boundaries" (2014, 3) and are consistent with military planning, which defines space on the basis of operational requirements derived from specific strategic objectives, such as, for example, missile range for continental defense purposes.

In this case, the "Arctic" addressed by American strategy is usually defined according to the Arctic Research and Policy Act of 1984 as

"(...) all United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including

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<sup>124</sup> <https://www.amap.no/documents/doc/amap-area-gis/868>

<sup>125</sup> An isotherm is a line connecting points having the same mean temperature (in this case, in July).

<sup>126</sup> Taiga is also known as boreal forest. In the US and Canada, however, the term "taiga" can also indicate the ecotone separating two biomes: taiga (treeless) and tundra (coniferous forest). This ecotone is also called "Subarctic".

the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian chain<sup>127</sup>”.

To fulfill the research objectives, a definition functional to the defense of territorial integrity should be agreed upon. At first glance, as all US Arctic strategy documents are based on the 1984 definition, this latter may serve the purpose of a functional definition for homeland defense in the Arctic. However, the official US definition<sup>128</sup> is not sufficient in our case because it should cover other territories in the functional sense proposed by Tamnes and Offerdal. Indeed, US presence in the Arctic is not strictly restricted to the areas indicated by the act but stretches to other states’ territories through the presence of military capabilities abroad. Since World War II, the US was militarily present not only on the homeland but also on the territories of allies of the North Atlantic Treaty Organization (NATO), namely Norway, Iceland, and Greenland/Denmark. After the end of the Cold War, US military facilities remained in Alaska, in Greenland (Thule Air Base), and Iceland (Keflavik Naval Air Base, a NATO base, a property of the US until 2011, now under restoration). The larger extent of the “US” Arctic was even more evident during the Cold War, as the US presence outside national borders was considerably higher than today in terms of number of outposts, intensity of militarization, and interference in other allies’ politics and defense.

Thus, for the aim of this research (where it is given that the primary objective set by politics is the protection of state territorial integrity), the perimeter of action of the US in terms of homeland defense should include its territorial sea, continental shelf, Exclusive Economic Zone (EEZ), and high seas within the Arctic Ocean, according to rights and responsibilities stated in the 1982 United Nations Convention on the Law of the Sea

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<sup>127</sup> Codified in: United States Code, title 15, Commerce and Trade Chapter 67 – Arctic Research and Policy, section 4111 – “Arctic defined”. The Act was amended in 1990, but the definition of the Arctic was not modified. It can be consulted at <https://www.arctic.gov/legislation.html>. The original definition, here quoted, is indeed section 112 of the Arctic Research and Policy Act of 1984 (Title I of P.L. 98-373 of July 31, 1984).

<sup>128</sup> Arctic Research and Policy Act (1984) defines the US Arctic as “(...) all United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian chain”.



(UNCLOS)<sup>129</sup>. This basis should be enlarged to the territory occupied by military capabilities functional to the protection of territorial integrity within the limits of self-defense and the rightful and feasible exercise of statehood. Because of this reason, in the range of the actions necessary to pre-empt or prevent threats to the US, such as terrorist attacks, there are also included facilities abroad and high seas, given the control of the global commons held by the US (Posen 2003). Consequently, Keflavik and Thule can be included in the perimeter of defense of the US. In fact, during the Cold War, the Keflavik base in Iceland served, among other purposes, for the monitoring and patrolling of the GIUK (Greenland-Iceland-United Kingdom) gap, the chokepoint connecting the Norwegian Sea to the North Atlantic Ocean. Today, Keflavik is still a NATO base under restoration. Then, Thule was the base of an important radar system during the Cold War, and still today it is a fundamental base for the North American Aerospace Space Command (NORAD) and the Air Force Space Command.

**Table 2.3. A functional definition of the American Arctic for homeland defense purpose**

<i>State of Alaska</i>
<i>American territorial sea</i>
<i>American contiguous zone</i>
<i>American continental shelf and EEZ</i>
<i>High seas within the Arctic Ocean</i>
<i>Thule Air Base (Greenland)</i>
<i>Naval Air Station Keflavik (Iceland)</i>

Source: own elaboration.

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<sup>129</sup> According to Article 3 of UNCLOS, a state's *territorial sea* extends up to 12 nautical miles (1 nautical mile = 1,852 km), measured from baselines along the state's coast shape. According to Article 33, the *contiguous zone* (no more than 24 nautical miles from the baseline of the territorial sea) is the zone where the state can exercise its control functionally to its customs, fiscal, immigration, and sanitary policy. According to Article 76, the *continental shelf* "comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend upon that distance". The *Exclusive Economic Zone* (EEZ), according to Article 55, is "is an area beyond and adjacent to the territorial sea, subject to the specific legal regime established in this Part, under which the rights and jurisdiction of the coastal State and the rights and freedoms of other States are governed by the relevant provisions of this Convention".

The reason for the inclusion of *high seas* (Article 86: "all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State") lies in the active involvement of the USA in the protection of global commons, e.g. sea, space, air (Posen 2003), which will be extensively demonstrated later in the essay.

To conclude, hereinafter Circumpolar Arctic or Arctic will be synonymous with the AMAP definition for the sake of readability. The expression *North American Arctic*<sup>130</sup>, a key-concept for this analysis, will indicate instead the functional definition presented above (see Table 2.3).

#### **4.1.3 The concept of homeland defense and the selection of relevant actors**

A central concept in this research is that of *homeland defense*, used to operationalize the concept of territorial integrity, which constitutes the outcome observable at the end of 2019 in terms of strategic posture<sup>131</sup>. Homeland defense is indeed a concept formally introduced after the 9/11 terrorist attacks in June 2005 by the US (DoD 2005) and then retrieved in following defense documents, such as the US Air Force doctrine<sup>132</sup>. As such, threats on the homeland include also non-conventional threats, both man-made (terrorist attacks) or natural (natural disasters). According to the Air Force doctrine framework, threats on the homeland and homeland operations can be related to homeland security or homeland defense.

It is necessary at this point to explain the difference between two expressions that can be confused, namely homeland security and homeland defense. *Homeland security* is a concept introduced by the Department of Homeland Security (DHS) in July 2002, addressing the threat of terrorist attacks on US homeland after the terrorist attack that hit the US on 9/11. The strategy defines homeland security as “a concerted national effort to prevent terrorist attacks within the United States, reduce America’s vulnerability to terrorism, and minimize the damage and recover from attacks that do occur” (DHS 2002, 2). As such, the priority of homeland security is to prevent terrorist attacks (DHS 2002, 2), comprehending also attacks using chemical, biological, radiological, and nuclear weapons, as well as reducing the US vulnerability to terrorist attacks and minimize the damage and recover in case the terrorist attack occurs (DHS 2002, 2-3). To address homeland security, in November 2002 it was created a new department, the Department of Homeland Security<sup>133</sup>, which collaborates with the President and the Homeland Security Council created in October 2001, as well as other agencies (e.g., Federal Bureau of Investigation, US Coast Guard, US Customs and Border Protection).

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<sup>130</sup> In other contexts, the term serves for different purposes and it can be based on specific geographical attributes. Here, they are not contested; the term is simply used to indicate the concept explained above.

<sup>131</sup> See par. 4.2.

<sup>132</sup> The doctrine was published as a complementary document to Joint Publication 3-26 “Joint Doctrine for Homeland Security”.

<sup>133</sup> Homeland Security Act 2002.

By contrast, *homeland defense* is a task performed by the Department of Defense (DoD), and, similarly to homeland security, it was reshaped after 9/11. Homeland defense consists in “the protection of US sovereignty, territory, domestic population, and critical defense infrastructure against external threats and aggression, or other threats as directed by the President” (DoD 2005, 5). As highlighted by the Air Force (2006), for example, missions regarding homeland defense are characterized by counterair emphasis (2006, 2). Since land approaches to the continental US are through Canada and Mexico, it is acknowledged that not only “[T]hese nations, in close cooperation with the United States, contribute to North American security through their law enforcement, defense, and counterterrorism capabilities” (DoD 2005, 11), but also that “[T]he water and airspace geographically contiguous to the United States are critical homeland defense battlespaces” (DoD 2005, 11). Thus, the central actors for homeland defense are the US Northern Command (USNORTHCOM or NORTHCOM), the North American Aerospace Defense Command (NORAD), and the US Pacific Command (USPACOM or PACOM), in collaboration with other combatant commands, the Intelligence Community, the US Coast Guard, and international and domestic partners (DoD 2005, 11-12).

At this point, it is necessary to apply the concept of homeland defense to the analysis. Since homeland defense is a concept rooted in the defense of homeland territorial integrity, homeland defense is conceived as the outcome of the adaptation to the climate change process, particularly in the North American Arctic. On this basis, for analytical purposes, it will be useful to select the actors involved according to the following parameters: the functional relevance for homeland defense, the geographical relevance (in the North American Arctic) that the actor holds<sup>134</sup>, and the direct nexus the actor has with climate change adaptation.

It goes without saying that the DoD is the actor the most responsible for homeland defense since DoD is “responsible for deterring and, when directed by the President, defeating direct attacks against the United States” (DoD 2005, 12). The DoD itself comprises several actors, which can be selected according to the aforementioned reasons: the Secretary of Defense, the Departments of the US services under DoD (Army, Navy and Marine Corps<sup>135</sup>, Air Force - from the strategic to the tactical level), which are all active both in the North American Arctic and in the actual adaptation process on the whole US territory and beyond, some combatant commands, namely NORAD, fundamental for air defense (DoD 2005, 12), NORTHCOM fundamental for both functional and geographical reasons, together with PACOM (later renamed US Indo Pacific Command since May 2018). Another relevant actor

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<sup>134</sup> Homeland defense operations can involve also preemptive strikes at the global level against threats to the homeland or forces and installations (DoD 2005): this aspect, however, is not considered relevant for the purposes of this research, which is focused on the adaptation process on homeland territory.

<sup>135</sup> While the Marine Corps is part of the Department of the Navy, it is a service independent from the Navy. As such, the Marine Corps has its own member in the Joint Chiefs of Staff and a war college (the Marine Corps University at Quantico, Virginia).

within the DoD is the Joint Chiefs of Staff (JCS), which provides advice directly to the President and the Secretary of Defense. Also, NATO has been added since the military alliance has historically played an important part in its members' Arctic security, US included. The US President, moreover, as Commander in Chief and Chief of the executive, holds a unique position about national security in general and homeland defense in particular and has significant powers in dealing with all climate change-related issues in national politics and foreign policy. All those actors are institutional actors, as in Table 2.4. Other relevant actors, which are engaged in an advisory role on homeland defense and adaptation to climate change beyond the official institutional framework, are think-tanks and former officers and flag officers who, as we will see, are often actively engaged in advising on the impacts of climate change on national security. Those actors are defined as non-institutional actors, as in Table 2.4.

**Table 2.4. Relevant actors selected.**

<b>INSTITUTIONAL</b>	President/Commander in Chief	
	Secretary of Defense	
	DoD (as whole institution)	
	DoD: Departments of Army, Navy, Air Force	
	DoD: Joint Chiefs of Staff	
	DoD: Secretary of Defense	
	US Services: Army, Navy, Marine Corps, Air Force	
	Combatant commands: NORAD	
	Combatant commands: USNORTHCOM	
	Combatant commands: USPACOM/USINDOPACOM	
	NATO	
	<b>NON-INSTITUTIONAL</b>	Think-tanks
	Active-duty and retired officers, generals, and flag officers (expressing personal views)	

Source: own elaboration.

## **4.2 Compliance of the empirical case to the analytical framework**

The empirical case should fit the analytical framework according to the specificities of the case. This paragraph will briefly point out how the concepts related to the case are framed in the framework to provide a basis for the following empirical inquiry. To answer the research question, it will be necessary to investigate how the changes at the system level, derived from climate change, affect the outcome under investigation (in figure 2.2, the elements within the red circle). While the effects of climate change are obviously observable at the global level, here it has been selected the case of the effects of climate change in the Arctic, one of the areas in the world where the effects of climate change are the most evident and have more direct effects, and the actor under investigation (the US).

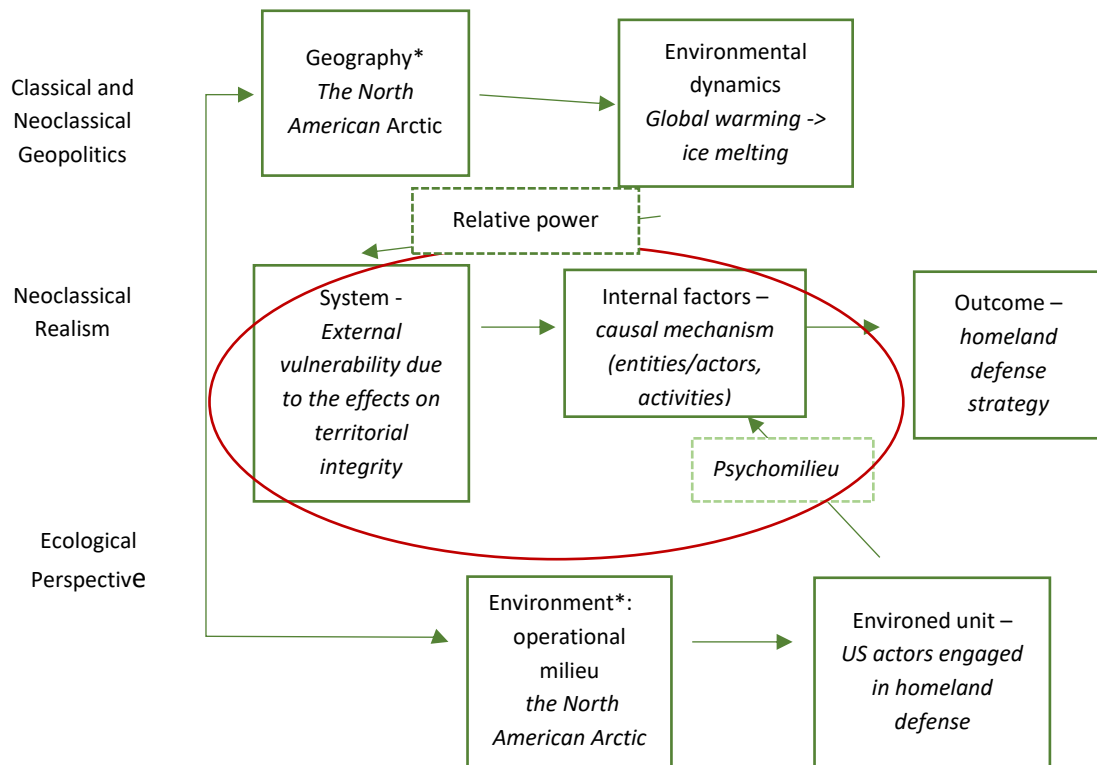
Assuming that geography is still the stage of politics (Classical Geopolitics), but that the nexus between geography and human action is probabilistic and that physical geography is changing (Neo-Classical Geopolitics), has been selected a specific geographical area, that of the North American Arctic, affected by the environmental dynamic at stake, climate change. It has been argued previously that climate change can jeopardize the territorial integrity of states, making states thus more vulnerable and weakening their relative power at the international system level. Consequently, the empirical outcome, reflecting the impacts of climate change on territorial integrity, is constituted by the homeland defense strategy observable at the end of 2019 and limited to the American Arctic. However, *how* and *why* a state can adapt to such a *stimulus* depends on a great variety of factors, both domestic and international. The issue is rooted in the central *tenet* of the Ecological Perspective, according to which human and non-human factors (both called “environment”) do interact with some envired unit (here, as said before, the focus is on the operational *milieu* constituted by non-human factors). Indeed, the Ecological Perspective is based on the fact that the envired unit does not necessarily respond to the environment or that the “image” that it has does not necessarily correspond to the operational *milieu*.

To uncover how the process of adaptation has been performed by the actors (or envired units), it has been adopted a Neoclassical Realist insight hybridized with concepts of probabilistic geopolitical theory, according to which relative power is translated into outcomes through unit-level factors. Uncovering those factors according to a causal explanation will be the very focus of the mechanism<sup>136</sup>.

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<sup>136</sup> As it will be shown later, differently from the *summa* by Rose (1998) and Taliaferro *et al.* (2009), the framework is not variable-based. On the contrary, the major Neoclassical inspiring issue is constituted by the attention posed to the incentives and constraints at the system level reflected on the internal level.

**Figure 2.2. The application of the analytical framework to the empirical case.**



Source: own elaboration.

\*both terms indicate geographical objective reality.

### 4.3 Method

The following paragraph will address the method used in the research. Indeed, recent literature suggests that process tracing, the method adopted here, can be applied not only to studies in public policy and political economy but also to IR and Security Studies for the sake of a transparent and rigorous explanation (Mahoney 2015; Robinson 2017; Tannenwald 2005). As a first step, the operationalization of the causal mechanism will be specified as well as the hypothesized causal mechanisms (par. 4.3.1), then some words will be spent on the sources used in searching for the cause(s) and the final assessment of the validity of the empirical results (par. 4.3.2).

#### 4.3.1 The operationalization of the causal mechanism

To uncover how climate change effects are equalized through adaptation by the actors into an outcome in terms of homeland defense, the method adopted is process-

tracing<sup>137</sup>. Process-tracing consists of the unboxing of a causal mechanism linking a cause, or a set of causes, to an outcome and provides a careful analysis of the development of policies and causal relations in general<sup>138</sup>. Christine Trampusch and Bruno Palier (2016) have listed eighteen variants of process-tracing, going from more inductive to more deductive nuances. What they have in common is that they identify or test hypotheses on causal mechanisms (Trampusch and Palier 2016, 5) and, as argued by Derek Beach and Rasmus Pedersen (2015, 1), “[T]he essence of process-tracing research is that scholars want to go beyond merely identifying correlations between independent variables (Xs) and outcomes (Ys).” Mechanisms (Tilly 2001), the core of process-tracing research, are neither theories nor intervening variables, but, according to one of the most accepted definitions, they are instead “entities and activities organized such that they are productive of regular changes from start or set-up to finish or termination conditions” (Machamer, Darden, Carven 2000, 3). According to this definition, *activities*, usually expressed by verbs (Machamer, Darden and Carven 2000, 4), are producers of change and *entities* are “the things that engage in activities” (Machamer, Darden and Carven 2000, 3). Here, for the sake of readability, it has been preferred to use a more familiar term, *actors*, to indicate entities.

The general roadmap for an explaining-outcome process tracing (the variant here adopted) is based on abduction (Peirce 1955), intended as a “dialectic combination of deduction and induction” (Beach and Pedersen 2013, 19). In this research, the first stage will follow an inductive logic, a usual choice in the case of a “little-studied outcome” (Beach and Pedersen 2013, 20). It will be necessary, as first, to gather empirical evidence in the form of an empirical narrative. Then, through an iterative process, the deductive path may be undertaken during or after the inductive stage of the research in order to test the empirical records according to some hypothesized causal mechanism and then finally assess the validity of a sufficient explanation. For the achievement of the final step, however, there are no rules: the deductive process can be repeated until “an assessment of whether all of the relevant facets of the outcome have been accounted for adequately while ensuring that the developed explanation best explains the evidence instead of plausible alternative explanation” (Beach and Pedersen 2013, 21). It will be necessary to stop “when we are

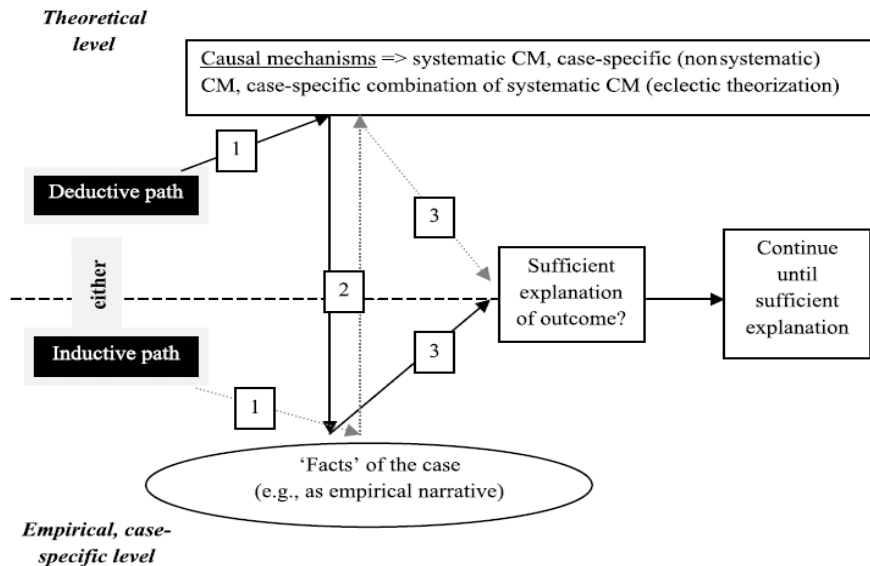
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<sup>137</sup> A well-known and solid account of process-tracing as research method is the work by Alexander George and Andrew Bennett (2005).

<sup>138</sup> According to John Gerring (2007, 173), “(...) process tracing is akin to detective work. The maid said this; the butler said that; and the suspect was seen at the scene of the crime of Tuesday, just prior to the murder. Each of these facts is relevant to the central hypothesis – that Jones killed Smith – but they are not directly comparable to one another. And because they cannot be directly compared, they cannot be analyzed in a unified sample. The maid’s testimony is empirical, and it is certainly relevant, but it cannot be reduced to standard dataset observations, and it is not meaningfully understood within a formal research design”. In this aspect, process-tracing resembles more to “detective work, legal briefs, journalism, and traditional historical accounts” (Gerring 2007, 178) rather than to quasi-experimental works.

satisfied that the found explanation accounts for the most important aspects of the outcome” (Beach and Pedersen 2013, 21). The two-stage approach is summarized in Figure 2.3.

Figure 2.3. Explaining-outcome process-tracing.



Source: Beach and Pedersen 2013, 20.

In methodological terms, this research aims to reconstruct the mechanism through which the actors involved in the Arctic strategy are adapting their plans with respect to climate change impacts, pointing out the causal mechanism that has led to the actual outcome in terms of homeland defense strategy. Referring to the parts of the causal mechanism<sup>139</sup> (which as a whole represents the adaptation process), it is argued that *some* components of the US security community, namely those directly engaged in the making of the Arctic strategy at all levels of warfare, (see par. 4.1.4) are to be considered as the actors

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<sup>139</sup> It should be specified that according to the definition of mechanisms here adopted, the causal mechanism is not operationalized according to variables' logic. According to a probabilistic understanding of mechanisms, "mechanisms are simply chains of intervening variables that connect the original posited cause and the effect" (King, Keohane and Verba 1994, 87). Here it is adopted a deterministic and not probabilistic understanding causality, thus "[v]ariance implies that a probabilistic understanding of causality is utilized – something that makes little sense when we are engaging in single-case studies" (Beach and Pedersen 2013, 37). Variance in causes or outcomes in a "real" world case does not make sense, indeed.



which are the producers of change, engaging in two activities loosely inspired by the Sprouts (1965)<sup>140</sup>, which are:

- *identification*: among actors, a consistent degree of consensus on what should be conceptualized as climate change effects and on its impacts on homeland defense in the North American Arctic;
- *management*: deliberate actions should be pursued in order to effectively equalize the impacts of climate change on homeland defense in the North American Arctic.

On this basis, the causal mechanism will be realistically made of interrelations of actions undertaken by the selected actors, which can eventually constitute the basis for claiming whether climate change is shaping US Arctic posture and acting as a driver for national security planning. All parts together can result in one of the possible general combinations, whose cause or set of causes are to be found through a careful assessment of the analyzed evidence in the light of the outcome observable in March 2020:

- *Hypothesized mechanism 0 - no impact*: the actors are not adapting, so changes in national security planning are not responses to climate change *stimulus* and eventual initiatives should be attributed to other causes, with few motivated exceptions;
- *Hypothesized mechanism 1 – mere adaptation*: given the specificities of the empirical case, actors are responding to climate change effects through adaptation, but they do not consider climate change as the driver of the process (management without identification), with few motivated exceptions;
- *Hypothesized mechanism 2 – conscious adaptation*: given the specificities of the empirical case, purposeful adaptation is pursued by actors and climate change is perceived as the driver of the process (identification *and* management), with few motivated exceptions among actors.

A fundamental step is then the specification of the contextual factors or scope conditions, once assumed the relevance that contexts have in process-tracing analysis (since the same causal mechanism in a different context may lead to a different outcome, as pointed out by

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<sup>140</sup> In the original theory (Sprout and Sprout 1965, 22-25), the relationship between environment and enviroined unit is conceived as a response to a *stimulus*. The response is a *behavior*, constituted by both self-conscious and not purposeful responses. *Action* is then a kind of behavior which is “consciously purposeful” (Sprout and Sprout 1965, 23) and *decision* is a “purposeful choice of ends or means or both” and is thus a sub-category of action (Sprout and Sprout 1965, 24).

Falleti and Lynch 2009). All parts of the mechanism will be then specified according to Figure 2.4.

#### 4.3.2 Sources and validation of within case-evidence

To determine whether each part of the causal mechanism actually occurred (and thus validate or dismiss hypothesized mechanisms), it will be necessary to assess the inferential weight of the relevant empirical observations, “turning” them into mechanistic evidence. This step is fundamental because it permits the individuation of causes, which are the focus of the entire inquiry. In this research, the traditionally established categories of mechanistic evidence will be used for this purpose (Beach and Pedersen 2013, 124, 126,175-182):

- account evidence (empirical material content in the form of statement or narrative);
- trace evidence (derived from the mere existence of empirical traces);
- pattern evidence (statistical patterns);
- sequence evidence (chronology of temporal and spatial events);
- *e-silentio* evidence (absence of some expected piece of evidence).

Concerning the sources, evidence will be searched in both primary and secondary sources. *Primary sources* can thus be memoirs, public speeches, statements, interviews, and newspapers; *secondary sources* comprehend historical scholarship and academic literature. The main empirical records for this research will be, e.g., declarations, military doctrines, official documents, defense budget, laws, presidential directives. On the basis of these sources, *qualitative indicators* will be used to assess causality, taking into consideration every time the actor who produced the evidence and the possible reasons for his/her action. Indicators will be divided into *institutional statements* on what is declared by actors (e.g., official speeches, documents, reports mainly of the legislative, executive institutions) and actual *practices* (e.g., political measures for homeland defense, actual projects for the relocation of bases, armed forces’ budget recalibration, changes in maritime route). Evidence retrieved on this basis will be then enhanced through *elite interviews*. Interviews will fulfill three purposes on the basis of what stated by Oisín Tansey (2007) on the application of elite interviews to process-tracing: corroborating what has been established from other sources (triangulation increasing the credibility of findings), establish what the selected actors think (providing new information), and reconstructing a set of events (source of data on what has been debated or before decision making and action taking) (2007, 766-767).

The validation of the empirical evidence will be pursued on the basis of the so-called *process-tracing tests* (Van Evera 1997), depending on the specific part of the causal mechanism under investigation, and through *triangulation*, namely the qualitative comparison of different sources of the same type, different types of sources or different types of evidence in assessing the probability of evidence (Beach and Pedersen 2013, 138).

## 5. Conclusion

The purpose of this chapter has been to outline the theoretical relevance of the research and the research design of the empirical case. On this basis, the theoretical approach has been applied to the empirical world through an analytical framework. This latter has been developed on the basis of the literature gaps presented in Chapter I (i.e., the enduring but neglected importance of geography as *explanans*, the gap in Realism on climate change, the need for some theoretical-grounded contribute to the militarization of climate change literature). It is out of contention that this approach presents inevitable limits, and it has been acknowledged that it can provide only a partial insight on the effects of climate change on the political domain and even on national security<sup>141</sup>. Nevertheless, the application of the analytical framework to an empirical case should provide some new evidence on the process through which states are adapting to climate change, at least from the perspective of national security. In the end, the research should answer the following questions: *how is the US adapting to climate change impacts in the North American Arctic, as far as homeland defense is concerned?* and, in case some changes in Arctic posture are detected, *why was US Arctic posture revitalized?*

For this purpose, the theoretical part at the beginning of the chapter has been fundamental to provide a theoretical ground to the empirical analysis, especially in a literature context where geography is overlooked. Thus, it has been argued that 1) *environmental dynamics can have evident impacts on the territorial integrity of states*, and they can consequently weaken the relative power of states acting normally in a condition of international anarchy. Adaptation is not a forced step, and states are not necessarily responding to climate change, however. It is thus interesting to uncover to what extent and why states do adapt national security planning to climate change.

To uncover causality underpinning an empirical outcome, as second step 2), *it has focused on the Arctic region*. There is more than one reason for choosing the Arctic. At first, the change in physical geography now occurring in the Arctic is a significant example of the impacts of climate change. Then, literature has conceptualized the Arctic in various and sometimes incompatible ways, going from the Arctic as a global strategic bulwark to the Arctic as a unique and persuasive case for effective international governance and cooperation (also called in literature the “Arctic exceptionalism”). Moreover, IR literature has only marginally addressed the impacts that climate change has on state survival with respect to the changes that the Arctic region is undergoing. Finally, concerning the research design, the selection of a specific case permits to isolate data for practical purposes.

The third step has consisted of 3) *selecting the actor on which the research is centered*. The choice of the US lies mainly in the fact that empirically the shift from an Arctic granting continental defense in the north to an Arctic representing a totally new challenge in terms of national security is particularly evident. Moreover, the US as Arctic state has been considerably less addressed with respect to other Arctic states. According to the US-specific

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<sup>141</sup> The very concept of security itself is indeed a major debate in IR (Baldwin 1997).

case, it has been operationalized: 1) the targeted geographical setting (the North American Arctic), 2) how the concept of “territorial integrity” is operationalized (homeland defense), and 3) the actors involved, selected according to their role with respect to at least two parameters among homeland defense strategy, the defense of the North American Arctic, and climate change impacts on national security. The scope of the analysis is that of uncovering the mechanism through which the US is responding to the impacts of climate change on its territorial integrity (adaptation to climate change), in order to shed some light on how national security planners are incorporating geography and climate change in national security planning and demonstrate whether climate change can act as a driver for national security planning. The expected responses are no impact, mere adaptation, and conscious adaptation. It will be up to the next chapters to delve into the empirical case.

## CHAPTER III

# Origins of US Climate Security and Arctic Strategy: Assessing the Contextual Factors

*“Have honor place north pole at your disposal”*

*“Thanks for interesting and generous offer.*

*I do not know exactly what I could do with it”*

(Correspondence between

Robert E. Peary and President William H. Taft, 1909)

### 1. Introduction

Among Arctic states<sup>142</sup> and new actors participating in the scramble for the Arctic (Sale and Potapov 2010), the superpower which emerged from the Cold War has devoted scarce attention to the evolving Arctic geopolitical scenario, as it is evident in both the media coverage and the gap in academic literature addressing the American Arctic. While in January 2009 the US issued its first Arctic strategy in the form of one of its most traditional national security documents – the presidential directive – during the same year Canada and Norway published multifaceted documents addressing numerous aspects of Arctic politics ranging from national security to indigenous communities (Government of Canada 2009; Norwegian Ministry of Foreign Affairs 2009<sup>143</sup>). It was not until the second Obama administration that the US issued its first “public” Arctic strategy (2013), but since that moment, the number of defense documents addressing the Arctic has risen sharply, and US Arctic strategy has significantly evolved.

At a very first glance, US Arctic posture seems puzzling. On the one hand, the US was part of the Arctic Environmental Protection Strategy (1991), it has been a member of the Arctic Council since its foundation (1996) and has recently assumed its chairmanship (2015-2017). On the other, the US has not ratified the UNCLOS yet, and a survey conducted by the Arctic Studio found “that Americans had a greater affinity for the Rocky Mountains, Great Plains, and Pacific than the Arctic” (Arctic Studio 2017, 1). “Anecdotes” such as the Seward’s icebox, the answer sent by President Taft to the discoverer of the North Pole, Robert Peary (“I do not know exactly what I could do with it”) or the “Forgotten War” fought in the

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<sup>142</sup> Canada, Kingdom of Denmark, Finland, Iceland, Norway, Russian Federation, Sweden and United States are the “Arctic States” (also called “the Arctic Eight”), the members of the Arctic Council founded in 1996.

<sup>143</sup> The second Arctic strategy by Norway.

Aleutians and its Kiska *fiasco* are usually quoted as proves of the minimalist US posture towards the Arctic. To discover the reasons behind the US Arctic posture and how it included climate change in strategic planning in the region, this chapter will engage as first in a macro-reconstruction of the significance (Spykman 1939, 40) of the Arctic from the perspective of the US and will explain why the Arctic has played only a minor geopolitical and geostrategic role for the US. In the second part of the chapter, it will be explained under which conditions the US turned to consider the Arctic under the light of *climate* security.

From a methodological perspective, the chapter will assess the so-called *scope conditions* or *contextual factors* (par. 2). To outline scope conditions and define the context in which climate security (in particular concerning the Arctic) has emerged in the US, a broad temporal perspective is necessary. As it will be seen, the very first US approach to the Arctic dating back to Polar voyages will indeed provide further evidence on how the Arctic has been *crucial (only) to grand strategy* in the period from the 1850s to the end of the Cold War (par. 3). In addition, *climate change itself* and the consolidation of *scientific consensus on global warming* in the 2000s through the release of the 2001 and 2007 IPCC Reports, constitute the “gunpowder”<sup>144</sup> that made the causal mechanism of adaptation detonate (par. 4).

## 2. Understanding the context: the search for scope conditions

The great variety of Arctic postures by Arctic and non-Arctic states<sup>145</sup>, noticeable also in media coverage, is striking evidence of the extent to which specific contexts affect each state’s posture towards the Arctic. One of the very first steps for approaching Arctic strategic postures is constituted by so-called Arctic strategies. Even at a very first glance, the differences among the Arctic strategies (Heininen 2012) issued in the 2000s are evident on various levels. Differences can regard the very type of document (e.g., Canada and Norway’s public report, Iceland’s parliamentary resolution, US presidential directive, China’s white paper) or the topics addressed (e.g., national security, indigenous rights, territorial claims, wildlife protection). Moreover, the very presence of pictures, graphs or maps, or just plain text is a basic but remarkable point in comparing Arctic strategies. So, which are the factors that account for the actual content of Arctic strategies? Differences in national history, form of government, or the proximity to the Arctic region, are just some (and trivial) explanations for the differences emerging from an explorative comparison among Arctic strategies.

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<sup>144</sup> Quoted in Falleti and Lynch (2009, 1152).

<sup>145</sup> The definition derives from the Arctic Council (<https://arctic-council.org/en/about/>). Arctic states are defined on the basis of the Ottawa Declaration, while the status of “non-Arctic states” applies to observers approved by the Council.

Those contextual factors, also called scope conditions<sup>146</sup>, are here defined on the basis of the definition of context given by Tullia Falleti and Julia Lynch, according to which context is made by “the relevant aspects of a setting (analytical, temporal, spatial, or institutional) in which a set of initial conditions leads (probabilistically) to an outcome of a defined scope and meaning via a specified causal mechanism or set of causal mechanisms” (2009, 1152). Following Falleti and Lynch (2009, 1152), “a causal explanation requires the analyst to specify the operative causal mechanism and to delineate the relevant aspects of the surroundings - that is, those that allow the mechanism to produce the outcome.” Thus, it is necessary to define the context in which the mechanism under investigation is supposed to function (Beach and Pedersen 2013, 54), bearing in mind that the same causal mechanism if placed in two different contexts can produce a different outcome<sup>147</sup>.

The following part of the chapter will be outlined which are the factors that can account as contextual factors of the causal mechanism under investigation. The question is: *which are the factors that activated the mechanism of the US adaptation to climate change in the Arctic?* To do so, it will be necessary to outline the specificities of the US context<sup>148</sup>.

### **3. From private funding to police state: the US approach to the American Arctic until the end of Bipolarism**

Why has the Arctic played a marginal role in US politics? To answer this question, it will be necessary to investigate the roots of the US Arctic posture and reconstruct the significance of the American Arctic from national security and grand strategy. The sources used are mainly secondary sources, consisting of academic literature, mostly derived from History and Political Geography, while memories constitute primary sources. The following scenarios will be thus analyzed: the Columbian Era in Western Circumpolar Arctic (par. 3.1), the Polar Mediterranean (par. 3.2), the massive militarization of the American Arctic (par. 3.3), and its final abandoning (par. 3.4).

#### **3.1 The American way to the Arctic (1850-1910s)**

The US legacy is quite recent in comparison to other countries. According to W. Gillies Ross, more than 60% of Arctic expeditions originated in Great Britain and only 20% in the US

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<sup>146</sup> The final assessment of the contextual factors relevant for the empirical case is presented in par. 5.

<sup>147</sup> For a wider theoretical analysis on the formulation of conditional theoretical arguments, please see Walker and Cohen (1985).

<sup>148</sup> Such a process may be endless due to the great variety of features characterizing every context, so that an unavoidable simplification is necessary. For this reason, there will be pointed out only those factors relevant for the objectives of the research, namely those related to the North American Arctic and climate change impacts on national security.

(1997, 328). Two specific historical characteristics of US Polar explorations were its *private nature* and *the relatively minor part* it played in the overall history of the US. Typically, US explorations were privately organized and funded (Robinson 2006, 10, 53). In any case, none of them was planned by the US government following the Barrow's way to the Arctic (1840s), according to which British expeditions should have significantly been funded and organized by the Crown. Contrarily, in the US only private initiatives and the willingness of a patron made explorations feasible, as proven in the case of Henry Grinnell. The US has never expressed substantial national interest in the conquest of the Arctic "frontier" comparable to the Old West conquest. At least, Americans displayed much more pragmatism in explorations with respect to other countries, as proved by the use of ships and crews much smaller than those of the Royal Navy, and by their cooperation with Eskimos dating back even to the Kane expedition (1856). The Columbian era of the US in the Arctic can be divided into three arguments: *the exploration of the Northwest Passage in the search of Franklin* (1850-1883), *the quest for the North Pole* (1894-1909), and *the colonization of Alaska* (1867-onwards).

US Arctic explorations started as *humanitarian missions* along the Northwest Passage when in 1849 lady Jane Franklin, the British Polar explorer's wife, made a direct appeal to the American President Zachary Taylor. Her unconventional appeal as a British woman directly writing to the American president found the President and the Congress's approval and, most importantly, the willingness of Henry Grinnell, a wealthy merchant from New York. The first Grinnell expedition, led by Lt. Edwin de Haven, was thus the first national US Polar voyage in the Arctic. According to Michael F. Robinson (2006), Grinnell's expedition represented a safer alternative (that of a war against nature) for the US national pride than the ongoing war in Mexico (1846-1848). Franklin was not found, though. The second Grinnell expedition led by Elisha Kent Kane (de Haven's surgeon on *Advance*) was officially approved by the Secretary of the Navy. This was not the last expedition that Grinnell sponsored. Until the interest in Polar voyages and in the fate of Franklin progressively vanished, Grinnell played a major role in sponsoring American polar voyages, now supported by patrons, private and public institutions. The third expedition to rescue Franklin, this time led by Kent's surgeon, Isaac I. Hayes, received funds also from organizations like the American Geographical Society, the American Association for the Advancement of Science, the Smithsonian Institute, and the American Philosophical Society. Each of those expeditions added cartographic details (and totally new areas) and proceeded farther north. Finally, the bones of seventy-nine of Franklin's men were found by Hall on King William's Land during Charles F. Hall's five-year pilgrimage in the Canadian Archipelago.

After the disclosure of *Erebus* and *Terror's* fate, Congress funded \$50,000 for Hall's expedition to the North Pole (Robinson 2006) - the next objective of polar expeditions. However, at the end of the 1870s, at the time of the infamous expedition of the *Jeannette* (sponsored by James Gordon Bennett, the *New York Herald's* publisher) and Adolphus



Greely's expedition (part of the IPY and under the Army Signal Corps)<sup>149</sup> public interest for Arctic explorations was already declining. With Walter Wellman's expeditions, national interest in explorations almost vanished. Wellman heavily relied on technology in trying to reach the North Pole with his airship *America* (1905, 1909) in a similar way to Nansen's ship *Fram*. Before and after his voyage, he had to face the general public's disapproval of his "feminine" trust in technology, strongly at odds with the explorer's masculine attributes that were so cherished by US public opinion (Robison 2006).

Indeed, US explorations generally neglected technological improvements, as proven by the fact that Peary and Cook's expeditions to the North Pole were classical heroic expeditions conducted by ship, dogsled, and marching. It follows that such a conservative attitude prevented US explorers from achieving systematic progress in the "colonization" of the Arctic, limiting the US involvement to individual, old-fashioned and heroic voyages. The capricious fortune of US explorations was due also to the presence/absence of major wars, such as the Mexican War or the War of Secession, which heavily affected the return of explorers who sailed in unfortunate periods, as in the case, as in the case of Isaac Hayes (1860-1861) and Charles Hall (1864-1869). As mentioned before, the very beginning of Arctic explorations was motivated merely by humanitarian purposes. At the beginning of the XX<sup>th</sup> century, US expeditions ended with the tragicomic *bagarre* between Cook and Peary, featuring also some false made by the editors of the *Hampton's Magazine*, who modified the context of the speech of one contender (Mora Zerbini 1977). Indeed, both Peary and Cook claimed to have reached the North Pole in the very same year, and their declarations come just four days after the other. At home, they were the object of cartoons making fun of them and depicting the explorers as fighting children (Robinson 2006). Thus, the answer sent by President Taft to the discoverer of the North Pole, Robert Peary ("I do not know exactly what I could do with it") is usually considered illustrative of the US attitude on the Arctic, even during the Columbian era.

In parallel with Arctic explorations, a fundamental building block of the American Arctic was the acquisition of Alaska. Just after the end of the Civil War, the sale of Russian America (Alaska, indeed) to the US originated from the debts in which Russia incurred after the Crimean War and the railroad modernization by Nicholas I. Russia thus decided to sell its colony at the price of \$ 7.2 million on March 30, 1867, and the US took possession of Alaska on October 18, 1867. The purchase was stipulated with the signature of the "Treaty of Cession of Russian America to the United States" by the Russian Assistant Secretary Eduard de Stoeckl and US Secretary of State William H. Seward. The acquisition of Alaska was immediately object of derision by newspapers and the public, calling it the "Seward's folly" or "Seward's icebox". In the end, Congress ratified the treaty on July 18, 1868, but some congressmen admitted that they had given their consent only after having been persuaded that doing otherwise would have offended the Russian government (Naske and Slotnick

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<sup>149</sup> As part of the IPY, Greely's expedition had specific scientific aims, that of building "comprehensive meteorological and geomagnetic models of the Arctic and the globe" (Robinson 2006, 90).

1994, 65). In Alaska, fur traders were replaced by companies of gold-seekers after 1896, when gold was discovered in the Klondike<sup>150</sup>, and mining districts were established on the peninsula. Due to the great shift of population due to the discovery of gold, Congress gave money to the US Geological Survey to begin the survey and exploration of the state of Alaska (Naske and Slotnick 1994, 85-86).

### **3.2 The Arctic as Pivotal Mediterranean: the Polar concept**

The Arctic acquired totally different importance in the aerial age. Differently from Classical Geopolitical authors, the so-called Arctic enthusiasts (generally aviators, and explorers) stressed the value of the Arctic as an extremely valuable geopolitical region in terms of unexploited resources, as well as its geostrategic importance for the projection of power across the transpolar zone. The possibility of flying over the Arctic was indeed a revolution for Classical Geopolitics. Mackinder's last work (1943) was written in a historical period when planes, submarines, and tanks were shaping strategy worldwide and his view of the effects of technology on Heartland defense was already a marginal voice in the strategic panorama. Indeed, even without climate change, the impenetrability of the Russian northern border, one of the fundamental assumptions of the Heartland theory, was already at stake during Mackinder's years. Indeed, with the advent of air power, the importance of the Arctic as a military front was recognized and often mystified by air theorists (Ristow 1944; Cooper 1946). A common point of those theories is that they were centered on the so-called Polar concept, "the idea that the shortest, most direct, and least defended route between the U.S. bases and Soviet targets involved flying great circle routes over the Arctic and North Pole" (Farquhar 36, 2014). As argued by John Farquhar (2014), the origins of this concept lay before the Cold War. In fact, the Polar concept in the US originated from the necessity for military build-up alongside the northern border of the continent.

One of the pioneers of the importance of the North American Arctic for national defense was William "Billy" Mitchell, the spiritual father of the US Air Force. Among the first, Mitchell heavily stressed the importance of the strategic location of national bases for global power projection, especially towards the Far East (1926), calling for a massive military build-up in Alaska<sup>151</sup> (1982 [1901-1903]). Mitchell struggled for the establishment of a perimeter of defense including Alaska and the Aleutian Islands, reaching Japan, Kamchatka, and the Kurile Islands (Farquhar 36, 2014) in order to provide forward defense for the US through air power, a position shared also with the explorer and anthropologist John J. Teal (1948), but his contemporaries in the US military poorly received that.

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<sup>150</sup> Daniel Libby, a member of the Western Union Telegraph expedition, found gold on the Seward Peninsula in 1866.

<sup>151</sup> As an Army lieutenant, Mitchell supervised the construction of the Washington-Alaska Military Cable and Telegraph System (WAMCTS) at the very beginning of the 20<sup>th</sup> century. The WAMCTS was a project for both military and civilian purpose with the aim of providing communication to scattered outposts of the military and the gold-seekers in Alaska.

To stress its geostrategic importance, the Arctic was depicted mostly through polar azimuthal projections centered on the North Pole<sup>152</sup> or perspective maps representing “the sphericity of the earth in regional fragments” (Barney 2015, 43) which initially aimed simply at emphasizing contemporary strategic issues on a global scale, such as the American vulnerability and power projection vectors. But in the end, by highlighting the proximity of the two superpowers in the Arctic, they were able to convey a new image of international relations – that spatial interdependence was creating an unstable balance of power<sup>153</sup> (Barney 2015; Boggs 1945; Bowman 1948). Cartographic perspectives were precursors of a wider “revolution” in strategic planning. Indeed, with the advent of nuclear power, ballistic missiles and nuclear-powered submarines gave the Arctic a totally new strategic importance. In August 1958 the American submarine USS Nautilus SSN-571, the first nuclear-powered submarine, reached the North Pole without surfacing.

The geopolitical value of the Arctic was attributed to its resources, whose importance was strongly emphasized in terms of power as means (Baldwin 2016, 109-111). While in “The Round World and the Winning of the Peace”, the last adjustment of the Heartland theory, Mackinder wrote that the essential productive and strategic resources lied in the Lenaland area, not in the Far North (1943, 598-599), from the advent of the airplane onwards many were the enthusiastic advocates of the richness of the resources lying in the Arctic and in the American Sub-Arctic (Stefansson 1921; Finnie 1942; Walters 1974). The intensive explorative study was called to be carried in the Arctic, in order to assess its potentiality not only in terms of rough great power potential but also for improving the overall standard of living (Bowman 1949). The Arctic had the potentiality for being a new American frontier, due to its wilderness and the power opportunity it gave to the American people (Seward 1869). The “symbolic capital” retained by an Arctic “colonization” was then expressed through the almost obsessive comparison with the conscious and systematic Russian civilian and military build-up on its Arctic shore (Stefansson 1953; Lattimore 1953).

As a result of such a revalorization of the Arctic, the possibility of Polar crossing inspired debate also in geostrategic planning (Weigert 1953b): not only the Arctic contained precious hard and soft power resources (as contemporary scholars would say), but it was also a fundamental strategic area in a global perspective. Once the use of Mackinder’s Mercatore map had been gradually abandoned, Arctic enthusiasts favored the azimuthal projection, which made possible the conceptualization of new strategic pivots, intended as the evolution of Mackinder’s Heartland concept: more intense human activity across the Pole resulted in the transformation of the Arctic ocean basin from outer sea to a mediterranean lying in “the new Pivot Area, which has made the Heartland eccentric” (Watson 1953, 40). The image of the world would have been shaped by a new longitudinal geography, making the traditional

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<sup>152</sup> The most popular were those by Richard E. Harrison’s in 1940s.

<sup>153</sup> According to some authors, the “revolution” of cartography played a fundamental role in the evolution of American foreign policy from political realism to a new emphasis on moral internationalism (for example, see Barney 2015).

east-west perspective obsolete, according to James W. Watson (1953, 41). The strategic concepts proposed by Arctic enthusiasts differed from each other, but they all have in common the relocation of the strategic pivot in the northern hemisphere and across the Polar Mediterranean (Renner 1942; De Seversky 1950).

### **3.3 Struggling against geography: the military “discovery” of the American Arctic (1920-1960s)**

So far, it has been demonstrated that according to US literature the Arctic possessed considerable resource potential useful to great power politics and that technological improvement made transpolar routes increasingly viable especially for military purposes. At a practical level, however, the American Arctic remained an almost unexploited “icebox” until the outbreak of World War II, and it was only during the Cold War that the US actively engaged in colonizing its Arctic, at least for military purposes. Grand strategy objectives characterizing this period triggered the intensive militarization of an area that was still at the outbreak of World War II to be explored and charted (par. 3.3.1). The following stages of World War II and the Cold War pushed the US to strongly militarize the area, including both American (par. 3.3.2) and allied territory (par. 3.3.3).

#### **3.3.1 The military as a producer of geographic knowledge (1920-1940s)**

Until World War II, despite the enthusiasm triggered by the new Arctic frontier and the potential of new technologies, Arctic exploitation’s costs were still higher than its benefits. While the Soviet Union engaged systematically in the colonization of its Arctic (Doel *et al.* 2014b)<sup>154</sup>, the American approach to the Arctic was far less systematic and proceeded in a more inconstant way. The geostrategic value of the American Arctic was not acknowledged until the 1940s. Still in June 1944, within the revision of the Army Air Force’s Initial Postwar Air Force Plan<sup>155</sup> it was argued “that even though Alaska is close to eastern Siberia, *it is far distant from the sources of Soviet Power*” (Converse 2005, cit. in Farquhar 2014, 36) and that the outposts in Alaska were “purposely not strong enough to constitute a dagger pointed at the Soviet heart or at Europe, but do provide routes for reinforcement (...)

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<sup>154</sup> It should be noted that great part of the Russian build-up on its northern shore was accomplished through forced work. From the mid-1930s, Stalin initiated a massive industrialization program for the development of the Soviet naval power, but with limited results. The construction of the White Sea Canal, built by concentration camp inmates, connecting the Baltic to the White Sea and projected for the transit of only light-vessels, was then abandoned in favor of less ambitious projects. In the end, the Northern Fleet (established in 1933 and operating from the Kola Peninsula) remained limited in size until the Cold War, with limited protection tasks along the Northern Sea Route.

<sup>155</sup> The US Air Force was established by the National Security Act of 1947. In the period between June 1941 and September 1947 it was called US Army Air Forces.

[and] constitute a deterrent to offensive action aimed at western hemisphere” (Converse 2005 cit. in Farquhar 2014, 36).

Due to adverse geographical and climatic conditions, the desired build-up did not take place at the magnitude demanded by Arctic enthusiasts. Massive aerial reconnaissance should have been carried out in order to map the partially unexplored Alaskan territory, and extreme temperatures, magnetic anomalies<sup>156</sup>, floating ice and unpredictable winds challenged human presence in the North American Arctic. Instead of a comprehensive civilian and military build-up, only national security got primacy. Heidbrink (2018, 89-90), for example, notes how little interest was shown by the US government in Greenland (later the most important steppingstone for intercontinental bombing and advanced continental defense) before World War II. At that time, the US had only one interest in Greenland, that of the cryolite mine in Ivigtut<sup>157</sup>; military interest itself was limited and no possibility for a civilian build-up in the area (which was considered part of the Monroe Doctrine) was taken into consideration by US politics. In 1947, after the intensive aerial reconnaissance operations held by the Strategic Air Command, a report concluded that “one of the large lessons learned in this winter’s operations in Alaska in that AAF [Army Air Force] knows how to operate aircraft in flight at any temperature, but it does not know how to preserve and maintain aircraft on the ground at extreme temperature with limited facilities” (cit. in Farquhar 2014, 37). Two exceptions are worthy of mention: *the International Ice Patrol* (since 1914) and the *Ivigtut mine*.

A preliminary step for the involvement of the US military in the Arctic was the establishment of the International Ice Patrol as a consequence of the Titanic disaster in the spring of 1912, to survey the icebergs<sup>158</sup> floating across Newfoundland, Nova Scotia, and Greenland. The objective of the International Ice Patrol, as noted by Robert DeCourcy War<sup>159</sup>, was “to determine the southern, eastern, and western limits of the ice and to keep in touch with this ice as it may move into the vicinity of the regular transatlantic steamship tracks” (Ward 1924, 54), broadcasting to passing ships regularly each, also to the Hydrographic Office

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<sup>156</sup> Due to the proximity to the North Magnetic Pole.

<sup>157</sup> The mine was operated by a Danish company, but most of the mineral (sodium hexafluoraluminate) was shipped directly to the US. Here, it will be used for soda production and for aluminium synthesis. This process, prior to the development of its artificial synthesis during World War II, was completely dependent on natural cryolite (Heidbrink 2018, 90).

<sup>158</sup> Icebergs are “large masses of floating ice originating from glaciers” (Arctic Council 2009, 22) and notoriously they can present considerable danger to ships. Usually, they originate from the west coast of Greenland, east of Baffin Bay, or from the east, round Cape Farewell, and go north as far as Davis Strait before turning south in the Labrador Current. Icebergs move freely as they circulate under the influence of the currents and winds. Icebergs can give origin to large tabular *ice islands* and to *bergies*, namely smaller and hardly detectable icebergs (Arctic Council 2009, 22).

<sup>159</sup> First member of the Association of American Geographers to be identified as professional climatologist and the first Professor of Climatology in the US in 1910 (Rohli and Bierly 2011, 548-549).

and the Weather Bureau in Washington (Ward 1924, 56). At the same time, patrols collected scientific data on the rate of drift of icebergs, deep-sea temperatures and salinities, currents, along with a series of oceanographic stations, and ice conditions for fixing the location of the transatlantic steamer tracks (Ward 1924). The service was interrupted only in 1917 and 1918 because of the American involvement in World War. Another unique involvement in the Arctic was the interest in the Ivigtut cryolite mine at the outbreak of World War II when Denmark was occupied by Germany. Americans developed firstly a system that guaranteed civilians supplies, and then detached a small group of USCG cutter-men for the protection of the mine. Finally, a treaty for the defense of the island between the US and the Greenlandic government was signed in 1941, granting the US military unlimited and unrestricted access to Greenland in exchange for the protection of the island. Through the presence of the USCG personnel on Greenland, deeper knowledge of the island was gained as well as stronger cooperation with local communities.

The *Aleutian war* forcefully tested the US preparedness on its own Arctic. The war in the North Pacific lasted fifteen months, from June 1942 to August 1943, but it is common to refer to it as “the Forgotten War” even though it was the only military campaign taking place on American soil during World War II and since the War of 1812. Not surprisingly, initially, Congress considered Alaska and the Aleutians “simply one of many up and coming American outposts that were ill-prepared for the looming war” (Polhamus 2015, loc. 243), giving primacy to the Asia-Pacific theatre. Despite the proximity to both USSR (valuable for the Lend-Lease Act) and Japan, the Aleutians were considered “strategic objective” only in May 1942, when Naval Order 18 was issued by the War Department (Polhamus 2015, loc. 388). In September 1939, the Alaskan military garrison near Skagway consisted of 400 men, with no significant military infrastructure, except for a small naval radio station and a little Coast Guard base at Dutch Harbor (Polhamus 2015, loc. 248). Col. Simon Bolivar Buckner Jr., the commander of the Army’s Alaska Defense Command, engaged actively in claiming the importance of the Alaskan front: within eighteen months (1939-1940) Alaska’s defense budget increased from \$4 million to \$350 million (Polhamus loc. 269). To the Navy bases in Kodiak, Sitka, and Dutch Harbor were added the newly established Elmendorf Air Base, Fort Richardson, Ladd Field, and the anti-aircraft sites and ground-troop garrisons all over Alaska ordered by Buckner (Garfield 1978, 59). Within five months of the attack at Pearl Harbor, Alaska’s military nearly doubled, and two modern aircraft squadrons were sent to the front – the first new aircrafts since the establishment of Buckner’s command (Polhamus 2015, loc. 314). The peak of the build-up occurred in summer 1943: at the end of the hostilities in August 1943, when the Japanese secretly withdraw 5,000 men from the garrison of the island of Kiska, over 143,000 American troops were expecting to battle the enemy, who, however, had already abandoned the island (Polhamus 2015, loc. 1022). With the US directly threatening Japan, a plan was submitted to the Joint Chiefs of Staff to invade the Kuriles

(Garfield 1978, 298-299), but due to a plurality of factors<sup>160</sup> (Garfield 1978, 299), the invasion of Japan from the Aleutian Chain did not occur.

After the end of the war, the outcome of the intensive reconnaissance and military build-up consisted in the establishment of military bases and scientific research centers, mostly for military purposes. On the US territory, between August 1946 and September 1948 the War Department General Staff conducted some projects for aerial reconnaissance in the Arctic, known as *Project 5* or *Project NANOOK*, to concretize the Polar concept. The project was approved by both the Chief of the Air Staff, Gen Carl Spaatz, and the Army Chief of Staff, Gen. Dwight Eisenhower. There were several operations conducted in the North American Arctic. Among those that are known there are: *Project NANOOK*, consisting of an ambitious Polar photomapping work and it was accomplished under the command of Major Maynard E. White (Chandonnet 2007, 400); *Operation FLOODLIGHT* searching for available land masses for future bases or weather stations<sup>161</sup>; *operation EARDRUM* and *Project 14*, which accomplished in May 1947 a trimetrogon photomapping of Greenland (Chandonnet 2007, 400; Farquhar 2014, 38). Geographical conditions not only endangered crews' lives but jeopardized also scientific findings. To overcome them, and to produce a reliable mapping of the North, reconnaissance crews

“used celestial navigation to determine True North and then adjusted the electronic, gyro-stabilized compass for precession and other technical error. Additionally, the crews measured magnetic variation that combined with aerial photography to create usable flying charts” (Farquhar 2014, 38).

In 1947 in northwest Alaska (Barrow), the US Navy created the Naval Arctic Research Laboratory to pursue research on Arctic conditions. For its part, the US Air Force created the Arctic Aero-Medical Laboratory at Ladd Air Force Base (Fairbanks, Alaska)<sup>162</sup>. The Army Corps of Engineers established the Snow, Ice, and Permafrost Research Establishment (in Illinois). Military funds were also aimed at university funding, *in primis* Barrow and Fairbanks in Alaska, fostering thus the study of physical environmental sciences, such as geomagnetism,

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<sup>160</sup> According to Garfield (1978, 299) those causes were the fact that USSR had not declared war to Japan (the proximity of the islands of Paramushiro and Shimushu to USSR made the eventual operations difficult), the impossibility of cutting the main Japanese resources supply lines, and the harsh climate of the Aleutians.

<sup>161</sup> The operation found so-called “Target X”, “a floating ice mass roughly fourteen by seventeen miles in size, which provided considerable information about the Arctic” (Chandonnet 2007, 400).

<sup>162</sup> Highly criticized, the US Air Force's Arctic Aeromedical Laboratory housed at Ladd Air Force Base in Fairbanks used iodine-131 (I-131) to evaluate the role of the thyroid gland in acclimatizing humans to cold (Farish 2013).

ionospheric physics, and physical oceanography, fundamental for the development of long-range communications and guided missiles and submarines (Doel *et al.* 2014b, 69). In 1947, the “Arctic Bibliography”, a voluminous work on Arctic scientific research, was translated into many languages, edited by the private Arctic Institute of North America (in Canada), and published thanks to the joint funding of the US Office of Naval Research, the US Army and Air Force, and the National Research Council of Canada (Doel *et al.* 2014b, 68).

### **3.3.2 The military as a geographical agent: shaping the American territory for security purposes (1950-1960s)**

It was the Cold War, and the geographical proximity of the two superpowers, that pushed the US to strengthen its Arctic frontiers and militarize its northern flank. The US and NATO<sup>163</sup> constructed military and scientific bases around the Pole and reinforced the World War II forward-deployment line along the Greenland-Azores chain. Indeed, Nikolaj Petersen in its valuable work on US Polar strategy (2011), points out that US Polar strategy became dominant since 1951, thanks to the introduction of intercontinental heavy bombers (B-36, B-52 Stratofortress) and air-refueling techniques which permitted the B-47 Stratojet medium bomber to perform intercontinental missions (2011, 91).

Indeed, after the phase of exploration and charting, the military became progressively engaged in the American Arctic until a massive militarization of the harsh and scarcely populated Alaska took place during the period 1950-60s. In the same period, ambitious projects were carried out abroad (Canada, Greenland, and Iceland). This period is characterized by the massive interference of the American military as a “geographical agent” (Hummel 2005) in the Arctic landscape: not only the technological context in the 1950s required “grounded” military infrastructure but the initiatives pursued by the military were aimed at turning Alaska into no less than “a natural laboratory for the armed forces, from survival schools and winter warfare exercise to advanced radar and communications networks” (Farish 2013, 4). This is demonstrated not only by the building of bases in harsh geographical conditions, as indispensable means for homeland defense and power projection, but also by the experimental projects that were held during this period, such as *Project Iceworm* or scientific research held in several Arctic laboratories run by the militaries, aiming at the transformation of the *landscape* itself. In the words of John B. Jackson, who experienced training at the Military Intelligence Training Center at Maryland’s Camp Ritchie in 1940-50s, the landscape was both *experienced* and *made* by the military (Farish 2013, 8; Lackenbauer and Farish 2007):

“[W]hile academics, intelligence analysts, and think tanks elsewhere in the United States were debating the ‘capabilities’ of a Soviet enemy, research and training in Alaska, although spurred by this confrontation,

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<sup>163</sup> Canada, Denmark, Iceland and Norway were the NATO members engaging in the Arctic theatre.



was focused on another antagonist: nature. And Alaskan nature was treated as unknown and unfamiliar, a challenge for scientists and soldiers alike” (Farish 2013, 8).

The point here is to note that the *possibility* of adaptation by people to Arctic conditions was the most notable contribution of Arctic enthusiasts – a crucial point in reconstructing the US psychomilieu. Without delving into the capacity of Russian people to adapt to extreme climates in the North, an issue heavily discussed between 1940-50s by Americans, it is enough here to point out that Americans notably perceived, based on the observation of civilian and military adaptability of Russians, that life in the Arctic was possible – for some, even necessary for the sake of United States’ great power politics. Nevertheless, this remained a minor position. In the agenda-setting process of the United States, geographical constraints still played a fundamental role, pushing the superpower to give priority to national defense and not to civilian build-up: in the end, while the military build-up was fostered for the sake of continental defense, the civilian “colonization” of the North has never been seriously pursued by American governments. On the contrary, Alaska ended up resembling a real police state (Hummel 2005, 66). Moreover, the Soviet build-up of the Northern Fleet and the militarization of the Kola peninsula fostered a stronger American military response. A chain of underwater listening posts (SOSUS) was established in the 1950s with the collaboration of the Norwegian government<sup>164</sup>. Their build-up continued until the 1980s, as a continuous response to the Soviet perceived advantage in the Arctic.

In the case of Alaska, it was the military that, acting as a true geographical agent (Hummel 2005), shaped the purpose of the region itself and laid some (fragile) bases for civilian development; this pattern was limited to the period 1949-1959. At its peak in the 1950s, active-duty military personnel constituted more or less 21% of the total Alaskan population, from almost 26% in 1952 to 15,4 % in 1959 (Hummel 2005, 50). The decrease can be attributed to the technological progress which required fewer men to operate complex systems. Overall, the percentage should reach a conservative estimate of 40-45% of the total Alaskan population (Hummel 2005, 51-52). Military build-up fostered also the construction of dual-use infrastructure and urbanization of the cities of Anchorage and Fairbanks<sup>165</sup>. In 1952, at the peak of US military presence in Alaska, one-quarter of the population (more than

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<sup>164</sup> The Barents Sea for the Northern Fleet and the Sea of Okhotsk for the Pacific Fleet. From the bases located on the Kola peninsula, the Soviet SSBN were able to be deployed in case of threat and to be stationed under the ice-cap. Notably, while the Soviets concentrated their forces into massive submarine fleets, the Americans used to send them singularly across deep oceans.

<sup>165</sup> In the period 1950-1960, Anchorage, due also to the proximity to Elmendorf Air Force Base and Fort Richardson, increased of almost 175%. Fairbanks, close to Ladd Air Field (later, Fort Wainwright) and 26 Mile Fields (later Eielson Air Force Base), more than doubled from 23,000 inhabitants to 49,000 (Hummel 2005, 53). As a consequence, in the early 1950s, both cities experienced severe housing shortage and housing costs became astronomical (Hummel 2005, 54).

fifty thousand people) was active duty military personnel (Martin-Nielsen 2018, 70). In 1969, the US Army Alaska counted a total amount of defense expenditure in Alaska amounting to more than \$1 billion in the period 1941-1945 (Huller 2005, 47).

Arguably, the Cold War and the advent of intercontinental bombers and missiles greatly fostered the Arctic strategic importance as a gatekeeper and as a base for power projection. However, its role was conceptualized in relational terms to the conflict between the two superpowers, and not as geopolitical importance *per se*; the Arctic was the central stage between the two contenders, as the shortest way for bombers and strategic missiles from one superpower to the other. But even military build-up was limited to the specific strategic objectives<sup>166</sup>. Hummel (2005, 61) also notes that the rationale of Alaska's state ferry system, the Alaska Marine Highway, and its connection to the military headquarters in south-central Alaska was based on national defense. Moreover, "the selection in 1948 of a colonel 'on loan' from the army as commissioner of roads for Alaska demonstrated the influence of the military in the development of Alaska's road grid" (2005, 61). During the Cold War, the army rebuilt the ports of Seward and Valdez, also improving the system of roads and railroads connecting them, and reopening and enhancing the port at Whittier (Hummel 2005, 61); international airports at Anchorage and Fairbanks were built with federal funds since 1949, in order to divert commercial aviation from military aviation as explicitly stated by the Alaskan Air Command (Hummel 2005, 62).

A key-project dating back to the Cold War was the Distant Early Warning Line<sup>167</sup> (DEW Line), a chain of fifty-seven radar sites across Alaska, Canada and Greenland established in 1957 by President Truman. Already in 1946, the US Army Air Force "proposed a string of northern radar sites that could track waves of incoming Soviet planes" (Lackenbauer and Farish 2007, 928), built on the basis of "comprehensive exercise in military geography" (Lackenbauer and Farish 2007, 928). The DEW Line served as America's first line of defense: completed in 1957, the DEW Line was the US early warning and interception system, reaching up to 100,000 feet in altitude along, roughly, the 69<sup>th</sup> Parallel North. To manage the DEW

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<sup>166</sup> An interesting case for the primacy of military interest on civilian gains is the Alaska Highway. Still in use today, its construction was completed in October 1942. The project aimed to connect the US to Alaska across Canada - from Dawson Creek (British Columbia, Canada), Fort Nelson, Watson Lake (Yukon, Canada), Whitehorse, to Delta Junction (Alaska). The idea originated during Hoover Administration, for civilian purposes, but since the beginning it faced strong opposition from Canada, which did not agree on its economic advantage and feared an excessive intrusion of the US in Canada's internal affairs. However, the fear, from both sides of a Japanese attack on North American soil fostered the construction of the Alaska Highway in less than a year. The construction was performed by the US Army Corps of Engineers and strongly supported by President Roosevelt for the sake of national defense. Indeed, on December 7, 1941, the Japanese unexpectedly attacked the American Navy at Pearl Harbor. Within ten years, more than 5,100 miles of mostly paved roads were constructed, creating a network among military's major bases and their logistical centers in south-central Alaska (Hummel 2005, 60).

<sup>167</sup> Originally known as "Project 572" (Lackenbauer and Farish 2007, 928).

Line, Americans and Canadians established NORAD in 1958 (headquartered in Colorado Springs, Colorado) for the two nations' integrated command of air and space defense<sup>168</sup>. The DEW Line was part of a multiple system of defense, starring two minor defense lines, the Pinetree Line (completed in 1954) running across Newfoundland to Vancouver Island, and the Mid-Canada Line running across the middle of Canada (completed in 1957). Both were dismantled between the end of the 1950 and the beginning of the 1960s. The DEW Line served almost for all the Cold War and was declared obsolete because of technological improvement in satellite reconnaissance only around the 1980s when the Strategic Defense Initiative was developed. While the DEW Line aimed at bombers, the new system, the Ballistic Missile Early Warning System (BMWES), built in 1959, provided long-range warning of ballistic missile attacks.

Within this framework, Alaskan natives' co-optation remained limited. In Alaska, the civilian population was drafted in the Ground Observer Corps (1953)<sup>169</sup>. Their task was to watch the sky for detecting some enemy aircraft, and indeed many of them belonged to amateur radio network or worked in searchlights and were able to use the Morse Code (Hummel 2005, 56). Natives were enlisted as soldiers of the Alaska Army National Guard (270<sup>th</sup> Infantry Group), usually known as "Eskimo Scouts." They were employed mostly in the west and northwest because of their intimate knowledge of the environment as hunters, whalers, or just local people (Hummel 2005, 56). In peacetime, they were pursuing assignments on reconnaissance, and in case of invasion, they would have been used to report covert intelligence (Hummel 2005, 56).

### **3.3.3 The military as a geographical agent: beyond US territory (1950-1960s)**

During the Cold War, militarization took place not only on the US territory but also beyond. In the defense perimeter of the US, Thule Air Base (northwestern Greenland) played a pivotal role in the Strategic Air Command (SAC)<sup>170</sup> for the North American Arctic defense. It was exactly the construction of Thule, as forward staging and refueling facilities for new intercontinental jet bombers B-36, B-52, and B-47, according to Petersen, the actual beginning of American polar strategy (2011, 91)<sup>171</sup>. The relations between the US and Greenland, however, have experienced ups and downs over the years.

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<sup>168</sup> US and Canada cooperation in terms of defense is a long story dating back to the end of 1812 War between USA and the United Kingdom. The Rush-Bagot Treaty (1818) laid the basis for the demilitarization of the border between the USA and Canada (United Kingdom). Military cooperation was pursued then through the framework of both NATO and NORAD, this latter since 1958.

<sup>169</sup> 1 of every 220 residents participated on a voluntary basis (Hummel 2005, 55-56).

<sup>170</sup> The SAC was established in March 1946.

<sup>171</sup> Thule is still the northernmost base of the US, and the most expensive overseas base (Colgan 2018, 39).

According to the Monroe doctrine, Greenland was part of the US foreign policy sphere, since the island geographically belonged to North America. The idea was shared, among others, also by Robert Peary, William Mitchell, and Hap Arnold. For example, Peary stressed the island's commercial value, rich in coal, cryolite, and glacial streams for the production of electrical energy (Fogelson 1989, 53). However, while there was no major problem for aircrafts landing on Greenland, plans for establishing bases on the ice cap failed because of ice, wind, and tide (Fogelson 1989, 58)<sup>172</sup>, so that its geostrategic value was unexploited. As mentioned before, US interest in Greenland was limited to the Ivigtut mine.

The situation suddenly changed when the US became interested in Greenland as tensions in Europe began rising concern. Secretary of State Cordell Hull did not express interest in acquiring Greenland, delegating this task to the Secretary of the War or the Navy (Fogelson 1989, 60). In May, however, a report by Secretary of War Harry H. Woodring stated that strategic advance would be “negligible and therefore unnecessary” (Fogelson 1989, 61). In 1940, US involvement in Greenland escalated when Germany occupied Denmark. In April 1941, the US and Denmark stipulated the Agreement Relating to the Defense of Greenland, which stated that “there is danger that Greenland may be converted into a point of aggression against nations of the American continent”<sup>173</sup>. The importance of Greenland for the defense of the American continent indeed was so significant that in the same year Hull wrote in a note to the Danish minister Henrik de Kauffmann that Greenland was part of the Monroe Doctrine (Weiss 2001, 32). It can be thus argued that the Polar strategy itself had not been conceived in collective defense institutions such as SAC or JCS, but it was instead promoted by the persons of Secretary of the Air Force Thomas Finletter and Colonel Bernt Balchen (a foremost specialist on Arctic aviation). It was their sustain to Polar strategy that led to the establishment of Thule AFB (Petersen 2011, 113).

After the refusal of the Danish government of selling Greenland to the US in 1947, the US through a secret expedition called *Task Force 8* by the Army Air Corps, established in Greenland two air bases, Bluie West One, and Bluie West Eight. In the words of US officials, the purpose was to make Greenland “the world’s largest stationary aircraft carrier” (Doel *et al* 2014b, 68). Once the two bases were constructed, the US Army (but actually the US Army Air Forces) was the military's largest branch on Greenland (Heidbrink 2018, 91). From 1948 to 1966, so in the early part of the Cold War, notes Janet Martin-Nielsen, “no part of the Arctic was as important to US strategic interests as Greenland” (2012, 69). Because of its location, in the words of US Air Force Lt. Col. Emil Beaudry, Greenland was “probably more vital to the defense of the United States than any other single polar area” as a likely avenue of approach (cit. in Martin-Nielsen 2012, 69). However, doubts were still present among US strategic planners. In 1950, the JCS joint strategic plans committee was uncertain about the importance of the Arctic in the short-run, even according to SAC Commander gen. Curtis

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<sup>172</sup> Norway with Norwegian Air Lines, Pan American Air Lines (US).

<sup>173</sup> *Agreement Relating to the Defense of Greenland*, Article 1 (1941):  
<https://www.loc.gov/law/help/us-treaties/bevans/b-dk-ust000007-0107.pdf>

LeMay, the Corps of Engineers and the Navy (Petersen 2011, 92, 94). On April 27, 1951, Denmark and the US signed the Defense of Greenland Agreement, permitting NATO to use bases (so-called “defense areas”: Thule, Sondrestrom, and Narssarsuaq) on Greenland<sup>174</sup>, unrestricted overflight and landing rights in all locations in Greenland and an implicit right to stock nuclear material, since nuclear material and weapons were not mentioned in the Agreement<sup>175</sup> (Weiss 2001, 33). The area chosen for its construction was a natural harbor, accessible by icebreakers, and almost free of permafrost (Herzberg, Kehrt and Torma 2018, 5). The base construction began secretly in 1951-1952, and it involved the work of 12,000 men and great amounts of information about the Arctic’s physical conditions (Doel *et al* 2014b, 68). In mid-1954, it was declared fully operational (Petersen 2011, 100).

The base, as it was said before, was originally meant to transfer aircraft to Britain and to fulfill the role of a weather and radio station. Actually, at the beginning of the Cold War, Thule was a temporary and spartan intermediate take-off and recovery base for medium-range bombers (a wing of 21 B-36s), later serving in the 1950s as an operational base for air-refueling of B-47 and B-52 (Petersen 2011, 100). The full consolidation of Thule AFB in the perimeter of defense of USA as the “decisive consolidation of the polar strategy” (Petersen 2011, 103) came with *Op. Power House* in December 1956<sup>176</sup>. After the successful management of *Op. Power House*, alert exercises increased (*Blue-Light*<sup>177</sup> and *Iron Bar*<sup>178</sup>). Moreover, extensive reconnaissance was carried out from the base, making Thule one of the

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<sup>174</sup> “The Government of the United States of America and the Government of the Kingdom of Denmark, in order to promote stability and well-being in the North Atlantic Treaty area by uniting their efforts for collective defense and for the preservation of peace and security and for the development of their collective capacity to resist armed attack, will each take such measures as are necessary or appropriate to carry out expeditiously their respective and joint responsibilities in Greenland, in accordance with NATO plans” (article I, Agreement relating to the Defense of Greenland, signed on April 27, 1951).

<sup>175</sup> Nuclear material at Thule AFB (Mk-6 and Mk-18 nuclear bombs) was stocked in the “Special Storage Areas” but there is no evidence of its presence until 1958 (Petersen 2011, 101).

<sup>176</sup> *Power House* took place in December 1956 within the framework of the Emergency War Plan conditions: it involved aerial refueling from Thule of three wings of B-47 (126 bombers in total) as a part of extensive pattern of airborne alert flights involving all of SAC’s bombers and spanning all of North America (Petersen 2011, 103), nonstop flights with aerial refueling around North America on a route from California to Newfoundland and then to the North Pole and back via Alaska to California.

<sup>177</sup> September 1957, a simulated B-52 combat mission (Petersen 2011, 104).

<sup>178</sup> December 1957, a comprehensive aerial refueling exercise (Petersen 2011, 104).

most important early warning system spots for the American continental defense<sup>179</sup>. At the time of its construction, Thule was the northernmost US Air Force base, with 90,000 acres, second in size only to the Strategic Air Command Headquarters in Nebraska, acting as a key deployment and refueling point and later as a Ballistic Missile Early Warning System, supported by a number of smaller military and scientific bases and installation on the island (Martin-Nielsen 2012, 71).

Since Greenland was still “terra incognita” to the US at the beginning of World War II (Martin-Nielsen 2012, 72), polar science was fostered by some military bodies such as the Snow, Ice and Permafrost Research Establishment (SIPRE), founded in 1949 as part of the US Army Corps of Engineers, and the Cold Regions Research and Engineering Laboratory (CREEL) formed in 1961 through the merger of SIPRE and the US Army Arctic Construction and Frost Effects Laboratory (1953). As Greenland entered in the US perimeter of defense later than the northern part of the continent, scientific involvement started in the very first years of US interest for the island: in the summer of 1954, SIPRE scientists undertook a comprehensive program of polar whiteout studies in Greenland beginning (Martin-Nielsen 2012, 74)<sup>180</sup>.

But probably the most impressive examples of the *making* of Arctic landscape were Camp Century and *Project Iceworm* in Greenland, a system of facilities reproducing on a broader scale the Norwegian naval base Oslavern (near Tromsø), this latter designed for patrolling submarines to hide or to be resupplied, extending deep into a network of mountain tunnels (Dodds and Nuttal 2016, 66). Working with (and under) the polar cap was not a novelty, though. Thule Air Base was the product of an extensive work conducted in harsh climate: after relocating the inhabitants of Thule in the village of Qaanaaq (also known as New Thule), the US Army Corps of Engineers, under *Operation Blue Jay*, transformed the original village of Pituffik

“into a hypermodern \$800 million station, with cinema, radio telecommunication, radar, and a three-kilometer-long landing strip for the bombers and reconnaissance planes that flew from Thule straight into the heart of Soviet Russia” (Herzberg, Kehrt and Torma 2018, 5).

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<sup>179</sup> In the spring of 1956 *Operation Home Run* was flown out of Thule, the largest and most sustained penetration operation against the Soviet Union during the Cold War. *Operation Home Run* lasted for seven weeks (20 March 1956-10 May 1956), a total of 156 sorties all in radio-silence mapping the northern littoral of the USSR from the Kola Peninsula to the Bering Strait photographically and electronically; the target area was divided into three sectors (Kola Peninsula-Dikson, Dikson-Tiksi, Tiksi-Bering Strait) operated by a group of nine aircrafts (Petersen 2011, 108).

<sup>180</sup> Those studies led to a theoretical understanding of the effects of polar whiteouts, from the disappearance of the horizon line to the loss of bright-object contrast perception to the apparent invisibility of snowdrifts (Martin-Nielsen 2012, 74).

However, as impressive *Operation Blue Jay* can be, it does not stand the confrontation with *Project Iceworm*, a product, according to Ingo Heidrbink (2018) and Erik D. Weiss (2001), of interservice rivalry in the period 1953-1960s.

Within the *New Look*<sup>181</sup> objectives, there was the development of nuclear strategic forces at the expense of conventional land and sea forces. In response to the Navy's SLBMs and to the Air Force's Minuteman (Weiss 2001, 31-32), the Army presented its Iceworm IRBM as a reaction to the threat posed in October 1957 by the Soviet launch of the Sputnik. Indeed, *Project Iceworm* represented a clear example of duplication of efforts (Weiss 2001, 53) similar to the interservice dispute of the Jupiter (Army) versus Thor (Air Force). The Army founded its vocation in mobile deployment, as

“[T]he Army's competence in dispersion, camouflage, field defense, logistical support for divided units, the use of reconnaissance for target acquisition, survey and geodesy, and transportation would make it the only service truly capable of a mobile deployment” (Weiss 2001, 54).

*Project Iceworm*<sup>182</sup> was thus aimed at testing the construction of military facilities<sup>183</sup> in extremely harsh climate conditions; specifically, concealing mobile IRBMs beneath the ice cap, “as part of a clandestine program to explore the feasibility of deploying up to 600 ballistic missiles [IRBMs] armed with nuclear warheads” (Colgan 2018, 39), which were moved on railways in tunnels covered by an ice sheet on an area approximately that of Alabama state, 52,000 square miles (Weiss 2001, 42). The cover for *Project Iceworm* was Camp Century, a Danish-American research facility including a nuclear reactor for heat and power underneath ice built by the Army Corps of Engineers in 1959-1960. Here, the US Army Polar Research and Development Center constructed subsurface shelters, roads, and housing for at least 225 people, facing impressive engineering problems, from the use of snow as construction material to the accumulation of heat in nuclear plants due to the presence of electric light or people (Clark 1965).

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<sup>181</sup> As expressed in NSC 162/2. *New Look* strategy was then formally presented by Secretary of State John Foster Dulles on 12 January 1954 at the Council on Foreign Relations.

<sup>182</sup> Still today, *Project Iceworm* is for a large part classified. The study conducted by Erik D. Weiss (2001) on the recent declassification of documents by the Danish Institute of International Affairs.

<sup>183</sup> The project included: two radar stations (Site I and Site II), Tuto Tunnels, Camp Fitschlench and Camp Century (Colgan 2018). The regional hub was Thule Air Force Base, built in 1951. The access to the inland ice was from a ramp at Camp Tuto (Dodds and Nuttal 2016, 67).

### 3.4 The end of the militarized Arctic (1960s-1980s)

With the development of ICBMs, Camp Century and its related projects (and in general so impressive forward-deployed bases) became obsolete. In the summer of 1963, the nuclear reactor shut down (Weiss 2001, 42). Studies on facilities' resilience stressed out the weakness of support facilities and the great extent of the area could dangerously draw the attention of a Soviet first strike or just of Soviet bombers (Soviet forces were stationing at Murmansk and testing at Novaya Zemlya) (Weiss 2001, 51-52). It is acknowledged that also hostility from the Danish government played a role in the abandoning of the project: Denmark, while willing to support defensive systems such as the Ballistic Missile Early Warning System or the DEW Line (Weiss 2001, 50), was not keen in supporting either potentially offensive systems or the deployment of nuclear weapons in Greenland. Besides, technical challenges<sup>184</sup> were considered too ambitious and expensive to be pursued in such extreme climate conditions (Colgan 2018, 41). Finally, "the adoption of the Mutual Assured Deterrence doctrine," in the words of Petersen, "changed Greenland's main mission to strategic warning of missile attack" (2013, 295), and after the end of the Cold War, missile defense has been directed against third-country threats (2013, 295). In this picture, a heavily militarized Arctic was no more a priority.

Thus, the US thus abandoned its Arctic, but the police state's legacy was still noticeable. Postwar scientific expeditions in the North were being funded overwhelmingly by military institutions, and journalistic articles were filled with terms such as "assault" and "invasion" on the northern environment (Lackenbauer and Farish 2007, 927)<sup>185</sup>. These were all short-term military goals (Lackenbauer and Farish 2007, 925). But they nevertheless

"transformed the human and physical geography of the North. Bulldozers tore permafrost off the ground, disrupting ecosystems and creating impassable quagmires. Forest fires, logging, over-hunting, and over-fishing depleted resources in the region. Arriving workers brought diseases, from measles to VD, which devastated indigenous populations" (Lackenbauer and Farish 2007, 925-926).

The abandoning of Camp Century reminds of the *Canol Project*, a dual-use project of World War II, designed to supply the military bases and their network of infrastructures across an

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<sup>184</sup> The horizontal flow velocity of the upper layers of a glacier varies with the distance from the coast, the distance between objects on the ice sheet does not remain constant with time. This fear, plus the weight of overburden, causes subsurface installations to deform and potentially collapse (Martin-Nielsen 2012, 76).

<sup>185</sup> Another case for the making of landscape was Project Chariot, the attempt to create an Arctic seaport near Point Hope through the use of nuclear explosions: the project was abandoned in 1962<sup>185</sup> (Farish 2013, 2).



east-west line following the Alaska Highway to transport oil from the refinery in Whitehorse through pipelines (Dodds and Nuttall 2016, 69). Its construction took two years (1942-1944), but in the end, the Canol Pipeline was used for fourteen months until it was considered outdated and then, totally abandoned. In this regard, Mark Nuttall underlines the limits in engineering and the insufficient attention devoted to the project. In the book co-authored with Klaus Dodds, they define the lack of interest and understanding of the *Canol Project* in these terms:

“[I]t was one of the largest projects ever undertaken in northern Canada and its environmental legacy remains very much in evidence, and a testimony to what happens when you either do not understand the subterranean worlds beneath frozen soil or fail to appreciate what happens when alien substances drain and seep into it” (Dodds and Nuttall 2016, 69).

US interest in the Arctic declined by the mid-1960s, as the rapid evolution of weapons systems, including ICBMs and SSBNs, made the maintenance of the garrison state given by the presence of militaries in the Arctic less vital for Washington than at any time since the early 1940s (Doel *et al.* 2014b, 71). In the end, the US Navy abandoned the Arctic Research Laboratory in Alaska in 1984, offering the base facilities to the Ukpeagvik Inupiat Corporation, a native group, as a private research facility (Doel *et al.* 2014, 78). As argued by Ronald Doel, “Arctic demilitarization began even before the Cold War ended” (Doel *et al.* 2014b, 78). Reconnaissance missions from Thule declined in the late 1950s: from mid-April to October 1958, no missions were flown, and from mid-November 1958 through early 1959 no reconnaissance aircraft were even rotated to Thule (Petersen 2011, 110). Offensive strategy was over, but Thule remained as the hub of the new BMWES<sup>186</sup>, extended to Thule without the need of the approval of the Danish government since it was located on an American defense-area (Petersen 2011, 111). Half of the DEW Line radar stations were decommissioned in 1964 (Lackenbauer and Farish 2007, 931). The *coup de grace* to polar strategy was the crash of the B-52 near Thule on January 21, 1968. After this, McNamara stopped the *Airborn Alert*<sup>187</sup> program in July. Concerning naval operations<sup>188</sup>, due to Arctic

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<sup>186</sup> Three radars based in Alaska, Britain, and Thule, giving 15-minute warning of a missile attack.

<sup>187</sup> Northern route started from bases in the Great Lakes area, crossed Hudson Bay and Baffin Island to enter the Greenland airspace at Disko Bay on the west coast, then to the east coast, and back to Labrador and land in New England (Petersen 2011, 111-112).

<sup>188</sup> The US reached the North Pole in 1958 with *USS Nautilus* (SSN 571). The Soviet Union made its first Arctic voyage in 1962 with nuclear submarine *K-21* and reached the North Pole in July with nuclear submarine *K-3*.

conditions and Cold War-mechanisms (in particular, the non-use of conventional offensive weapons between the two superpowers), “undersea warriors measured victory in terms of surveillance, detection, and constant monitoring” (Weir 2005, 414). Such a “conflict” was almost entirely centered on surveillance, detection, submerged capability, and destructive potential, rather than on destroying targets, as noted by historian Gary E. Weir, for nearly 50 years (2005, 414). In this scenario, the ice cap granted real advantages to both sides, providing stealth functional to the “virtual war” approach in the Arctic (Weir 2005): the ice cap, indeed, made detection virtually impossible.

In the 1980s, US undersea presence reached its peak<sup>189</sup> due to the deployment of the Soviet Typhoon class SSBN (specifically designed for under-ice operations), as pointed out by historian Adam Lajeunesse (2013, 519). In 1983, the US elaborated the “Maritime Strategy”, “a broad maritime concept for the global conduct of war in which the US Navy planned to attack Soviet forces directly in their northern bases” mostly through under-ice operations (Lajeunesse 2013, 519). It is worth noting, however, that after the end of the Cold War, the Navy has decommissioned most of its Arctic-capable submarines<sup>190</sup> – a point that will prove to be fundamental for further steps of the analysis.

Geography was one of the reasons for the abandoning of the Arctic. Indeed, less ambitious projects were indeed carried out in relation to ice and snow: “roads, aircraft runaways and landing fields, emergency shelters, fuel storage tanks, water wells, waste containment” and others (Martin-Nielsen 2012, 80). The operational reliability of aircraft in the High Arctic was aggravated by extremely low temperatures, adverse wind conditions, and winter darkness. Moreover, colonial curiosity declined as new technologies diverted attention from the region. Finally, as pointed out by Martin-Nielsen (2012), there was also a shift in US military and scientific personnel's attitude from the 1950s to the end of the 1960s. Scientific cooperation flourished at the global level already during Cold War with the IGY 1957-58 (Collis and Dodds 2008). Moreover, results on weather modification in Greenland were poor and never went beyond the exploratory stage in Greenland, even though Americans were pursuing programs during the Indian drought (1966-1967) and in North, South Vietnam, Laos, and Cambodia.

A further reason for the complete demilitarization of the Arctic derived from Cold War international dynamics on denuclearization originating from the Reykjavik Summit (1986). According to the Murmansk Initiative proposed by the Soviet leader Mikhail Gorbachev on October 1<sup>st</sup>, 1987, Gorbachev delivered a speech on the future of the Arctic, addressing global-level politics, scientific research, and environmental issues. As a response

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<sup>189</sup> From 12 ship deployments in the 1970s to 37 in the 1980s (cit. in Lajeunesse 2013, 519).

<sup>190</sup> Mostly SSN 637 class; only some SSN 751 had limited ice capabilities (Pittenger and Gagosian 2003, 6).

to Western military initiatives<sup>191</sup>, the Soviet leader proposed the demilitarization of the Arctic through six points: the establishment of a nuclear-free zone, the regulation of naval activity, international cooperation in resource development, scientific cooperation and involvement of indigenous peoples, environmental protection, and free access to polar commercial sea routes. The US effectively demilitarized its Arctic. Symbolically, in 1990 the DEW line was handed back to Canada, and the line was formally deactivated two years later. The cost of tearing down the DEW Line was \$300 million, and the two countries reached an agreement in 1996 to share clean-up costs. In 2000, the Secretary of Air Force F. Whitten Peters formally apologized to the Alaskan subjects of the AAL experiments; a total of \$7 million was awarded in compensation.

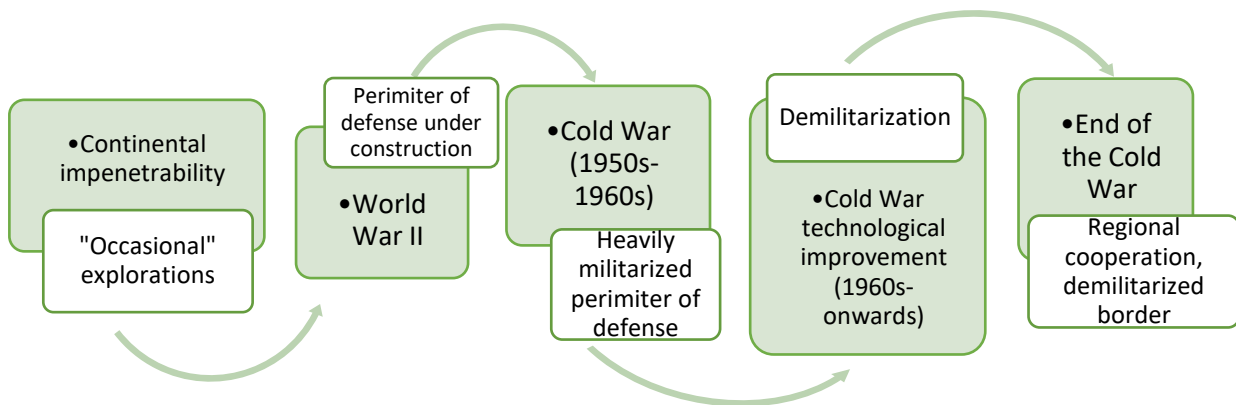
It is noteworthy that even the same geographical fact (the Arctic as a totally inhospitable place), has assumed different strategic meanings until the end of the Cold War, as summed up in Figure 3.1. Today, with the effects of climate change, the operational milieu of the Arctic has changed. However, it should be noted that the Arctic has been melting since the 1950s, and that public opinion and governments were already extensively coping with the effects of global warming on more fragile environments; but this *fact* was not incorporated in American strategic planning and, as it will be seen, for US national security planners the idea of *an endangered but geostrategically marginal Arctic* has endured throughout until the end the Cold War and the 1990s (National Security Council 1971; Arctic Research and Policy Act 1984<sup>192</sup>; White House 1994; Arctic Council 1996).

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<sup>191</sup> “A new radar station, one of the Star Wars elements, has been made operational in Greenland in violation of the ABM Treaty. US cruise missiles are being tested in the north of Canada. The Canadian government has recently developed a vast programme for a build-up of forces in the Arctic. The US and NATO military activity in areas adjoining the Soviet Polar Region is being stepped up. The level of NATO's military presence in Norway and Denmark is being built up.” (Gorbachev, retrieved from: [https://www.barentsinfo.fi/docs/Gorbachev\\_speech.pdf](https://www.barentsinfo.fi/docs/Gorbachev_speech.pdf)).

<sup>192</sup> *Arctic Research and Policy Act* (1984):  
<https://www.congress.gov/bill/98th-congress/senate-bill/373>

Figure 3.1 Major grand strategy scenarios involving the American Arctic.



Source: own elaboration.

#### 4. First steps of US climate security: the background

When and why has climate change entered US national security, also with respect to the Arctic? Answering this question is a preliminary step for the reconstruction of the mechanism, since the outset of US environmental and climate security constitutes the trigger of the mechanism itself, as it will be demonstrated in this paragraph. Indeed, without the inclusion of climate change in US national security, it would not be possible to analyze the impacts of climate change on US national security in the Arctic.

The paragraph proceeds in chronological order in reconstructing the background of US climate security. In line with the academic literature presented in Chapter I, the 1990s presented a multifaced scenario in which climate change has been regarded as part of a general and often vague concept of “environmental problems” (par. 4.1). Since 2007, with the public achievement of scientific consensus on climate change and the “boom” of the Scramble for the Arctic, the debate has been framed more systematically, directly addressing climate change - and the Arctic was immediately part of this debate (par. 4.2).

##### 4.1 Environmental problems: a vague and marginal concern for national security (1970-90s)

While environmental security as a practice effectively entered the stage only after the Cold War, this does not mean that in those same years the environment was excluded from international politics or the debate on the redefinition of national security (Floyd 2010, 68). On the contrary, in the last two decades of Bipolarism historical environmental conferences were held: worldwide political attention was directed towards important environmental initiatives, such as the first UN environmental conference held in Stockholm in 1972 (the Human Environment Conference), followed by the release of the Brundtland report (1987) and the Montreal Protocol (1987). Those conferences did not address national

security; moreover, as it has been said in Chapter I, the academic debate in the 1970s-1980s was focused on the very *alternatives* to the traditional concept of security rather than on traditional conceptualizations of national security. Such spirit was consistent with the content of environmental international politics, based on sustainable development, environmental protection, the removal of weapons of mass destruction, and human rights protection.

In the US, the very word “environmental security” was already in use since 1976, when the Democratic Party used it in a discourse attacking the Republicans (Floyd 2010). Concerning national security, the concept of environmental security (but not the word) was included in the 1988 National Security Strategy (NSS) by President Ronald Reagan. In the 1988 NSS, environmental “issues” together with health problems were the last category of threats to US interests. The NSS grouped various themes addressed also by academic literature in those years:

“[F]inally, the prospects for world peace and prosperity - and thus for U.S. interest in a just and progressive international order - will be influenced by other problems in certain parts of the world. Critical shortages of food, a lack of health services, and inability to meet other basic needs will keep millions of people, particularly in Africa, in peril. The dangerous depletion or contamination of the natural endowments of some nations-soil, forests, water, air-will add to their environmental and health problems, and increasingly to those of the global community. These problems cannot be resolved simply through outside assistance, for many of them will require policy changes and leadership by governments and elites in the countries themselves. But all create potential threats to the peace and prosperity that are in our national interest, as well as the interests of the affected nations.” (White House 1988, 6).

The 1990s and the demise of Bipolarism maintained alive the cooperative spirit of compliance with international agreements. An important step in environmental politics was taken in 1992 when the Earth Summit took place in Rio. In the same years, in the US environmental security was included for the first time after the end of the Cold War in the 1991 NSS issued under George H. W. Bush. According to the NSS, one of the objectives for the 1990s was the achievement of “cooperative international solutions to key environmental challenges, assuring the sustainability and environmental security of the planet as well as growth and opportunity for all” (White House 1991, 3). One of the reasons derived from the environmental depredations by Saddam Hussein; the NSS thus stated “that protecting the global ecology is a top priority on the agenda of international cooperation - from extinguishing oil fires in Kuwait to preserving the rain forests to solving water disputes to assessing climate change” (White House 1991, 2). The NSS then lists the environment as the next to last issue concerning the economic agenda of the US for the 1990s. The expression “global environmental concerns included “such diverse but interrelated issues as stratospheric ozone depletion, climate change, food security, water supply, deforestation,

biodiversity and treatment of wastes. A common ingredient in each is that they respect no international boundaries” (White House 1991, 22). Underrating or mismanaging those problems would mean putting at stake present and future generations, on which democracy and free-market economies are based (White House 1991, 22). Moreover, the document continues, environmental problems contribute to conflict (White House 1991, 22). In the end, it is assessed that preventing such political challenges (weakening democracy, fostering conflict) is part of the US “shared responsibility for global steward ship” as “a necessary step for global progress” (White House 1991, 22).

The 1991 NSS is just an example of the broad extent to which in the 1990s the concept of environment was conceived by the US. But it is also true that during those years, national security planners gathered various inputs on environmental problems. For US national security, the major issues were those of *environmental conflict* and *environmental compliance*<sup>193</sup> (see Table 3.1). On the one hand, there was the spreading of conflict in fragile regional contexts, aggravated by environmental problems (e.g., drought, resource depletion, environmental degradation), as depicted by the Toronto School. The spreading of conflict implicates an increasing US response at the international level – if not in full-fledged interstate or civil wars, at least in HA/DR missions. On the other, the environment entered into national security affairs in the new policies of DoD to mitigate the negative impacts of military activity on the US and allies’ environment, complying with federal environmental policies.

At the highest levels of national security, environmental conflict, aggravated by complex and interrelated contextual variables, was a significant concern. In 1994 the article by Kaplan published in the “Atlantic Monthly”, centered on the severe societal and political disruption caused by global warming and natural catastrophes, was read by President Clinton himself and his Vice President Albert Gore, as well as by the Under Secretary of State for Global Affairs Tim Wirth, and the US presidency made the article distributed to US embassies worldwide (Floyd 2010, 75). During the Clinton administration, Homer-Dixon, the Toronto School founder, was heard by top US national officials, and especially by Gore (Floyd 2010, 75-76). Both Kaplan and Homer-Dixon, whose contribution is evident in that period's major defense documents (White House 1994; White House 1995), emphasized how dramatically environmental stresses were affecting less resilient regions (Middle East, India, South-East Asia, Sub-Saharan Africa). Such severe disruptions were to be addressed by the US for the maintenance of the international liberal order. Indeed, on the lowest levels of the “ladder of escalation” of climate change scenarios presented by Michael T. Klare (2019), humanitarian assistance and disaster relief (HA/DR), military intervention, and global climate shock waves will be progressively increasing, becoming a more and more pressing threat for the US at the international level. While in such cases climate change will not be a direct threat to US security, it would become over time “a source of recurring crises and disasters abroad – events that could trigger an unending series of U.S. emergency response operations” (Klare

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<sup>193</sup> Environmental compliance is the conformity to environmental laws, regulations, and standards performed by some actor.

2019, 61), not to mention the negative impacts that climate change will have on countries considered vital for US security (Klare 2019, 90).

**Table 3.1. Environmental security issues debated in the US (1980-90s).**

	<b>Problem</b>	<b>Location</b>	<b>Response</b>
<b>Environmental conflict</b>	Spreading social and political disruptions (humanitarian emergencies, state failure, mass migration) intensified by environmental problems	International level, especially in less resilient regions.	HA/DR; external US military intervention.
<b>Environmental compliance</b>	Encroachment and destructive activities on the environment caused by military activities.	US territory and overseas bases (along with related civilian surroundings).	Implementing federal environmental policies on DoD holdings; removing hazardous waste.

Source: own elaboration.

A different but consistent trend concerned the debate over the impacts that the US military itself was having *on* the environment. Indeed, some words must be spent on the concern over environmental degradation caused by military activities typical of the 1970-1990s. Environmental degradation was one of the major issues taken into consideration by the defense sector. Consequently, the involvement of the military in this process of recognition of its impacts on the “environment” consisted mainly in the clean-up of hazardous waste and in limiting encroachment<sup>194</sup>. In 1988, on behalf of Congress, the Government Accounting Office (GAO) investigated DoD environmental impacts, releasing a final report on water pollution. In 1989, Secretary of Defense Dick Cheney under the H.W.

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<sup>194</sup> The term *encroachment* indicates “issues external to military operations that affect or can affect military installation testing, training, and other operations and overall military readiness” including also noise pollution, endangered species and critical habitat, wetland, water quality and supply, air pollution and quality, urban growth around military installations (Lachman, Wong, Resetar 2007, 3).

Bush administration declared that he wanted the DoD to be the “Federal leader in agency environmental compliance and protection” (Floyd 2010). Numerous environmental laws elaborated in the period 1970-1990s were then applied to DoD facilities: the Occupational Safety and Health Act (1970), the Clean Air Act (1970), the Endangered Species Act (1973), the Resource Conservation and Recovery Act (1976), the Clean Water Act (1977), the Comprehensive Environmental Response, Compensation, and Liability Act (1980), the Pollution Prevention Act (1990). Programs such as the *Chesapeake Bay Program*, part of the *Coastal America Program* by Bush<sup>195</sup>, or the internal debate on the use of the so-called dual-use capabilities<sup>196</sup>, are some of the most known initiatives for the application of federal policies to DoD holdings or to make military capabilities also serving civilian purposes.

According to Kent H. Butts (one of the few voices arguing for a positive role of the military on the environment in those years<sup>197</sup>), those initiatives are proofs of the fact that administrations and Congress have considered the environment as national security issue in a moment where the academic debate was still debating it (1994, 86-87). This is confirmed also by the fact that during the Clinton administration it was created the first environmentally focused office of the DoD - the Office of the Deputy Undersecretary of Defense for Environmental Security, headed by Sherri Goodman - addressing “military base cleanup and engagement with foreign militaries on environmental matters, resource efficiency, and pollution reduction” (Engelke and Chiu 2016, 6). For our purposes, however, it should be noted that while environmental compliance was the central topic concerning the environment for the militaries, on the nexus climate change-national security (and in particular US territorial integrity and homeland defense) from the part of the military there was hardly any available evidence.

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<sup>195</sup> The *Coastal American program* involved, among the others, the Environmental Protection Agency, US Fish and Wildlife Service, US Geological Survey, the US Army Corps of Engineers. It aimed at reducing habitat loss and degradation, pollution and remediating contaminated sediments (Butts 1994, 94). *Chesapeake Bay program* featured the know-how of the Army Corps of Engineers and funding given by the DoD (around \$50 million) for the improvement of water quality in Chesapeake Bay (Butts 1994, 95).

<sup>196</sup> A group of Democrats in the Armed Service Committee Albert Gore, Sam Nunn, Jeff Bingaman, Timothy Wirth and James Exon created the Strategic Environmental Research and Development Program presented in June 1990 and established on November, 5 1990. The program launched the use of defense and intelligence capabilities for monitoring environmental issues and environmental data gathering then presented in 1994/1995 NSS.

<sup>197</sup> On the existence of an ethical debate over the militarization of the environment, please see Chapter I, par. 4.3.4.



## 4.2 How US national security has turned to climate change in the 2000s

The 2000s marked sudden attention towards the implications of climate change on US national security. However, as it will be demonstrated, it was not until 2007 that it was made public that national security has taken climate change “seriously.” From an explorative analysis, it can be easily noted that in 2007 the CNA released the well-known report “National Security and the Threat of Climate Change,” which was followed by other notable initiatives, such as the release of the Presidential Arctic strategy in 2008, the establishment of the Task Force Climate Change (TFCC) in 2009 and the first DoD Climate Change Adaptation Roadmap in 2012. But to assess that it was the 2007 domestic and international context that triggered the mechanism of adaptation in the US case, the analysis needs further evidence. Thus, this paragraph will look for two “proofs” regarding the period *pre-2007*: how the defense sector reacted to the extreme weather events that hit the US *before 2007* and *after 2007*, and the reactions triggered by the well-known release of the report by Peter Schwartz and Doug Randall in 2003 on the implications of climate change on US national security, commissioned by the Pentagon Office of Net Assessment (Brzoska 2012, 45). If evidence is found, this can confirm that in front of actual or projected climate change impacts the defense sector, at least officially, has not engaged in identifying the nexus climate change-national security until 2007. Once assessed, it will be possible to proceed with the following analysis of the identification of the more specific nexus homeland defense in the Arctic – climate change.

The fact that until the 2000s climate change impacts on national security were hardly addressed by the defense sector and in particular by the DoD is proven by the silence on the relationship between extreme weather events and base resilience. According to US government officials serving in those years in DoD offices, extreme weather events *were not even perceived as effects of global warming*, in the absence of scientific background given to the DoD. Indeed, until the 1990s DoD was more concerned about environmental compliance, encroachment, and denuclearization around the world and extreme weather events were not conceived as effects of global warming<sup>198</sup>. The case of the devastation of Homestead AFB in Florida<sup>199</sup> by Hurricane Andrew on August 24, 1992, proves this. On that day, Hurricane Andrew transformed the air base into a “ghost town” (Grudo 2017, 54). The initial reconstruction and requalification cost the DoD more than \$100 million, including funds to reconstruct basic facilities such as the air traffic control tower and hangars (Grudo 2017, 58). While today the destruction of Homestead AFB is considered a direct consequence of climate

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<sup>198</sup> Interview with John Conger, former Principal Deputy Under Secretary of Defense (Comptroller) (16/06/2020); interview with Sherri Goodman, former US Deputy Under Secretary of Defense on Environmental Security (15/06/2020); interview with Frank Femia, Director and Senior Advisor of the International Military Council on Climate and Security (26/05/2020).

<sup>199</sup> Since December 17, 2003 the base has been re-designated as Homestead Air Reserve Base.

change<sup>200</sup>, at that time there were no voices relating *climate change* to the almost total ravage of the base.

It is no surprise that in this context the scenario made by Schwartz and Randall<sup>201</sup> on the implications of abrupt climate change for the US national security (2003), the first official mention of dramatic effects of climate change for the defense sector made public in February 2004, was met by public opinion as a bizarre and catastrophic military tantrum. The analysis, commissioned by the DoD Office of Net Assessment directed by the well-known strategist and futurist Andrew Marshall (Townsend and Harris 2004), was indeed tumultuously welcomed by the media due to its dramatic projections on national security:

“[H]eadlines included: ‘The Pentagon’s Weather Nightmare’, ‘Pentagon Report Plans for Climate Catastrophe’ and ‘Now the Pentagon Tells Bush: Climate Change Will Destroy Us’. Even the usually staid *The New York Times* discussed this effort of strategic foresight alongside the disaster-fantasy film *The Day After Tomorrow* in its story, ‘The Sky is Falling! Say Hollywood and, Yes, the Pentagon’. As with many topics which portend widespread doom and gloom, the press coverage itself eventually became news” (Shearer 2005, 446).

Compared to previous documents on how environmental factors or problems were related to national security and defense (par. 4.1), Schwartz and Randall's analysis is in striking contrast. The document indeed spends a great part of the analysis explaining the difference between gradual climate warming and abrupt climate change. It depicts climate change consequences on national security on the basis of *the most dramatic projections of climate change*<sup>202</sup>. Schwartz and Randall indeed pointed out that “[W]hen most people think about climate change, they imagine gradual increases in temperature and only marginal changes in other climatic conditions, continuing indefinitely or even leveling off at some time in the future” (2003, 4) and that “[T]he IPCC documents the threat of gradual climate change and its impact to food supplies and other resources of importance to humans will not be so severe as to create security threats” (2003, 4). The projected consequences on national security revolve around climate change as a threat multiplier, since

“[I]n the event of abrupt climate change, it’s likely that food, water, and energy resource constraints will first be managed through economic,

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<sup>200</sup> See, for example, Foley (2012).

<sup>201</sup> Peter Schwartz was head of planning at Royal Dutch/Schell Group and CIA consultant; Doug Randall was managing partner at the Global Business Network based in California (Townsend and Harris 2004).

<sup>202</sup> The scenario is “patterned after the 100-year event that occurred about 8,200 years ago” (Schwartz and Randall 2003, 2).

political, and diplomatic means such as treaties and trade embargoes. Over time though, conflict over land and water use are likely to become more severe – and more violent. As states become increasingly desperate, the pressure for action will grow” (Schwartz and Randall 2003, 14).

In this picture, Schwartz and Randall envisage growing tensions, from border skirmishes to regional instability and interstate war, massive migrations of refugees directed to the US, and a Department of Defense forced to manage the flows of refugees from the Caribbean and Europe. The analysis recommends to improve predictive climate models, assemble comprehensive predictive models of climate change impacts, create vulnerability metrics, identify no-regrets strategies “to ensure reliable access to food supply and water, and to ensure national security,” rehearse adaptive responses, explore local implications and geo-engineering options that control climate (2003, 21-22). However, the document concludes, “large population movements in this scenario are inevitable. Learning how to manage those populations, border tensions that arise and the resulting refugees will be critical” (2003, 22).

In the end, the Schwartz and Randall report remained a “one-shot”<sup>203</sup> or a sort of “thought experiment” (Bump 2015), and no other version followed the release of the unclassified version. As Allan Shearer reports (2005, 446), the scenario was not sent up the military chain, and it did not circulate at the highest levels of the Bush administration. The analysis by Schwartz and Randall was issued four years after the release of the first *National Climate Assessment* by the US Global Change Research Program<sup>204</sup> providing every four years federal, state, local governments and privates with reliable information on the effects of climate change, and two years after the publication of the 2001 IPCC AR. However, the context of 2003 was not able to trigger the mechanism, given the marginalization of the report by US defense.

The “awakening” that symbolically took place in 2007 with the release of the CNA Report<sup>205</sup> in the year in which scientific consensus on the existence of climate change publicly consolidated and climate change effects were becoming more and more evident to worldwide public opinion. Indeed, in the same year the IPCC Fourth Assessment Report (AR), using “a finely calibrated lexicon of certainty” (Schiermeier 2007), stated that “[W]arming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level” (IPCC 2007, 2). Not to forget, in the very same year, the Nobel Peace Prize was awarded to the IPCC and Albert Gore for their efforts to disseminate knowledge about

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<sup>203</sup> Interview with Frank Femia (26/05/2020).

<sup>204</sup> Following the *Global Change Research Act* of 1990 (<https://www.congress.gov/bill/101st-congress/senate-bill/169/all-info>).

<sup>205</sup> The content of the 2007 CNA Report will be outlined in detail in Chapter IV.

the anthropogenic causes of climate change<sup>206</sup>. The year 2007 was also part of the International Polar Year 2007-2008, and in 2007 it was also announced that sea ice retreated to the lowest extent ever recorded in the satellite era (National Snow and Ice Data Center 2007). On April 17, 2007, the UN Security Council also held its first session on climate security (UNSC 2007).

In this context, the opening of sea lines and the race for new resources made the Arctic a hot topic. Symbolically those tensions are represented by *Expedition Arktika 2007*, led by scientist and Duma member Artur Chilingarov, who planted the Russian flag in a titanium tube on the North Pole ocean floor. Envisaging dramatic geopolitical scenarios in a seasonally ice-free Arctic in the 2040-50s, public opinion and governments focussed mostly on a new edition of Gold Rush - the Arctic Rush – which apparently surpassed the exceptionally well-established cooperative climate of Arctic relationships implemented by international and subnational actors since the last decade of the Cold War. Climate change, international conflict, military build-up, nationalism, governance, and scientific cooperation are indeed all part of the extremely complex Circumpolar Arctic scenario, which attracts also other actors – some recognized as observers at the Arctic Council or even falling beyond contemporary institutional definitions (such as the European Union).

In US national security, the fact that climate change could “amplify human suffering through catastrophic storms” was then stated also in the major revision of US Sea Services strategy, the “Cooperative Strategy for 21<sup>st</sup> Century Seapower” (2007). The strategy, which does not address climate change *per se* but is a watershed initiative for a unified maritime strategy, also included the threats and opportunities derived from the warming Arctic. However, assessing thoroughly that it was the year 2007 that made possible the inclusion of climate change in US national security would be an overly simplistic statement - but is enough to stress that years of activism and scientific research *consolidated* in 2007, receiving public consensus beyond US defense. In conclusion, DoD apparently was not considering the inclusion of climate change into national security planning (except for the inclusion of usually vague and broad concepts, as seen in par. 4.1), while presidential politics (in particular during the Clinton administration), political figures and worldwide environmentalist movements were to the forefront. In those same years that led to the public consolidation of the existence of climate change, *some other* actors within the US security community (which will be identified in the next chapter) were preparing the ground for the inclusion of climate change into national security, also with respect to the Arctic (as demonstrated by the following initiatives in 2007-2009), one of the regions where climate change effects were the most evident.

## 5. Conclusion

How has the US Arctic posture been conceived before and after climate change? The reconstruction of the significance of the American Arctic has demonstrated that for the US

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<sup>206</sup> Nobel Peace Prize 2007: <https://www.nobelprize.org/prizes/peace/2007/summary/>

the Arctic has played “merely” a role functional to grand strategy and that its power potential, beyond the geostrategic advantages offered by its location, has not been fully exploited nor even seriously taken into consideration by politics or strategy. Indeed, US explorations during the so-called Columbian era have been conducted occasionally, mostly thanks to private initiatives and occasional funding, and usually rather than being considered national heroes as in other Arctic states, quite often US explorers were the object of scorn, either in case they showed “too much” reliance on technology or they were forgotten during other major events (such as wars).

It is evident that the Arctic never became part of the US frontier. Only the outbreaks of wars, the First World War (mainly for Russia) and World War II (also for the US), marked a major use of the Arctic for strategic purposes, as there were hardly incentives to invest in the region before. But it should be noted that the heavy militarization of the Arctic that was pursued during the Cold War seems to defend the thesis of the strategic importance of the Arctic, defended by so-called Arctic enthusiasts. The Arctic never became a geopolitical pivot area: to be considered as such, a pivot area should contain resources in terms of population, raw materials, and lines of communications, being worth of conquest and control by major powers on a global scale. Against those who sustained the richness of resources and the logistical and strategic importance of the Arctic, it is a matter of fact that the Arctic, according to US geopolitics and geostrategy, did not possess such impressive potential. Indeed, the enduring US geopolitical psychomilieu was the pivotal role of Eurasia (Stefanachi 2017). The Arctic *per se* was not as valuable as Eurasia, and its geostrategic importance has played a *functional* rather than *pivotal* role to the containment strategy. Compared to Eurasia, the Polar game was not worth the candle if only for the extreme environmental conditions.

Thus, the Arctic has been valorized (and militarized) especially when the possibility of an invasion of the North American continent became more likely<sup>207</sup>. To ensure the Lend-Lease Act and defense on the northern flank, important projects such as the Northwest Staging Route<sup>208</sup>, the *Canol Project*, or the Alaska Highway were initiated and eventually abandoned once grand strategy had been directed towards other objectives. The US plans for an invasion of Japan from the Aleutians were not accomplished; even costly and ambitious projects such as Camp Century or *Project Iceworm* were abandoned, despite massive investment, with the development of intercontinental missiles. Petersen for example demonstrates how “US interest in Greenland has varied with its shifting grand strategies” (2013, 295), but the concept can be applied to the whole US Arctic space and not only to Greenland, indeed. The demilitarization of the American Arctic was just one of the initiatives following the spirit of the Reykjavik Summit (1896).

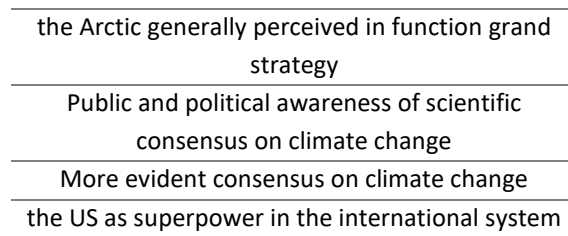
After the end of the Cold War, the Arctic entered into its “exceptionalism.” At the end of the analysis, contextual factors can be selected according to the purposes. More

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<sup>208</sup> The Northwest Staging Route, a vital support for the Lend-Lease Act, consisted in a series of airstrips, airports and radio stations (from Alberta, British Columbia, to Yukon). Facilities were built every 160 km from Edmonton, Alberta to Fairbanks, Alaska.

evident climate change effects in the Arctic (such as the severe decrease in sea ice level in 2007)<sup>209</sup>, the consolidation of scientific consensus in the form of the release of prestigious reports (IPCC 2001; IPCC 2007) also required by US domestic politics (National Climate Assessment Team 2000), and of the worldwide civilian awareness of the effects of climate change, are the contextual factors (all of them are summarized in Figure 3.2) that have fostered a response also by US national security planners to climate change. In addition to those factors, must be added what has been derived from a historical analysis (the functional role that historically the Arctic has fulfilled to US grand strategy) and some other, more evident, must be included, namely factors deriving from geographical location (US insularity; the relatively smaller proportion of Arctic shores with respect to other Arctic states) and the international system (the US is the international system’s superpower).

**Figure 3.2. Scope conditions of the empirical case.**



Source: own elaboration.

Today, the US revival of its Arctic may represent a change in the cooperative understanding of the Arctic (marginal to US grand strategy, however, as it has been seen) characterizing post-Cold War politics. For the first time, a change in Arctic posture, measured in terms of adaptation (given by identification and management processes), may be triggered by a change in the very geography of the Arctic and not only by technological improvement or grand strategy objectives. If climate change has revitalized the Arctic posture of a state which has basically neglected the Arctic since the 1960s and that historically has “used” it functionally to its grand strategy, this may strengthen the thesis that geography (and changes in physical geography) have a major role in shaping national security.

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<sup>209</sup> Concerning US climate security, it is generally agreed that the devastation caused by Hurricane Katrina in 2005 fostered serious concerns on climate change impacts on the homeland (see for example Busby 2007, 1-5; 2008, 484; Engelke and Chiu 2016, 7). Significantly, in the wake of those events, Busby claims that “[T]he intensity of those hurricanes [*Katrina and Rita, 2005*] – more than any other event since the hot summer of 1988 – put climate change on the radar of the U.S. policy community. Katrina was unprecedented in modern history. The storm destroyed much of New Orleans, caused more than \$80 billion in damages, killed more than one thousand eight hundred, and displaced more than two hundred seventy thousand people.” (2008, 484).

## CHAPTER IV

# Reconstructing the Identification Process until 2016: Climate Change from Threat Multiplier to Threat to Homeland Defense

*“(...) greater access afforded by the decreasing seasonal ice increased the Arctic’s viability as an avenue of approach to North America for those with hostile intent toward the U.S. homeland, and the Department will remain prepared to detect, deter, prevent, and defeat threats to the homeland.”*

DoD (2013, 8)

### 1. Introduction

Climate change publicly entered the debate over US national security in 2007. Before that moment, climate change impacts have not excluded US territory, but generally, those impacts, largely extreme weather events, have not been identified as effects of climate change. Due to the configuration of the contextual factors detected in Chapter III, since 2007 climate change impacts have been identified in relation to national security on various grounds (under the umbrella-term of *climate security*), ranging from the flooding of military bases to the greenization of the US armed forces. Some issues have been recently included also in published monographs (Thomas 2017; Snell 2018; Klare 2019).

While climate security in general is actively discussed in those days, this research, owing to its theoretical purposes, is limited to the analysis of the impacts that climate change has on territorial integrity in the North American Arctic. In the case under investigation, actors are thus expected to develop a strategy based on the defense of continental invulnerability to cope with the effects that climate change has on the North American Arctic. Following this line, the purpose of this chapter is the reconstruction of the identification process of the *link between climate change and US national security in the North American Arctic* until evidence of the recognition of climate change impacts on territorial integrity is found. The chapter's timeframe ranges from the end of the Cold War to the end of the Obama presidency and there will be taken into consideration, especially formal indicators.

The analysis will demonstrate that the identification process of the impacts of climate change on US national security in the North American Arctic (as far as the selected actors are concerned) moved from the mapping of its effects at the international level to the detection of the severe impacts on the homeland itself, not excluding homeland defense in the Arctic. After a premise on some relevant research design issues (par. 2), the analysis proceeds as follows. Firstly, the reconstruction addresses the role and the interconnections among

different actors: the operational level with a particular focus on the US Navy and the maritime domain (par. 3), the presidential level as far as expressed in presidential directives (par. 4), and the *stimuli* that “pushed” the DoD into the causal mechanism (par. 5). Finally, the consolidation of national security planning concerning climate change impacts and adaptation until the end of the Obama presidency is assessed and evaluated (par. 6).

## **2. Remarks on the research design for the identification process**

The first problem that arises in analyzing the development of US Arctic strategy since its very beginning is the dissemination of relevant material among many typologies of sources. The very fact that there is no systematic institutional framework comparable for example to nuclear strategy is the very first proof of the evolving but scattered nature of the making of US Arctic strategy. For example, the Navy’s posture and even that of DoD has assumed different formats (roadmaps, strategies, reports). For this reason, it is as first necessary to provide an overview of the documents taken into consideration in the chapter, categorized according to the selected actors (Table 4.1).

Then, to assess the parts of the causal mechanism, the analysis will proceed by taking into account the development of the identification process, evaluating qualitatively the degree of the entity’s engagement with respect to the context in which it has been developed<sup>210</sup> (by way of example, some of those processes are summarized in Table 4.2). For the sake of readability, the analysis will mostly proceed in chronological order and according to the entity which formulates the discussed evidence.

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<sup>210</sup> Indeed, in process-tracing the search for mechanistic evidence is given by the evaluation of several empirical observations through case-specific knowledge. Only at the end of this process observations are turned into mechanistic evidence (Beach and Pedersen 2013, 73).



**Table 4.1. Actors and corresponding sources for the reconstruction of identification.**

<b>Actors</b>	<b>Sources</b>
President	<i>National security directives, executive orders, presidential Arctic strategy.</i>
Secretary of Defense	<i>Statements, speeches.</i>
Department of Defense	<i>Reports to Congress, DoD Arctic strategy, directives, roadmap, elite interviews.</i>
Departments of Army, Navy, Air Force	<i>Strategies, Joint Publications, proceedings, roadmaps, memoranda.</i>
Joint Chiefs of Staff	<i>Joint Operating Environment, statements, Unified Command Plans<sup>211</sup>, National Military Strategy.</i>
Combatant commands: NORAD, USNORTHCOM, USPACOM/USINDOPACOM	[no means to engage in identification, except for hearings and statements by combatant commanders. This is included in “Active duty and retired officers, generals, and flag officers”].
NATO <sup>212</sup>	<i>Strategic concepts, speeches, reports.</i>
Think-tanks	<i>Reports, papers, elite interviews.</i>
Active-duty and retired: officers, generals and flag officers (personal view)	<i>Reports, newspaper interviews, newspaper articles, papers.</i>

Author’s elaboration.

Finally, while a comprehensive catalog of all mentions of climate change and the Arctic is desirable, two limitations must be pointed out: 1) the secretive nature of all security-related issues, 2) the fact that sources can be virtually in any expression of the actors selected and even beyond. It follows that a comprehensive outline of the process is potentially endless. The work presented in this chapter constitutes however a major step towards such a comprehensive understanding of the issue, as it provides also additional evidence in the literature on the persisting importance of geography in national security planning. Such an effort is worth it despite its inherent limits, especially in front of some of the huge gaps outlined in previous chapters (i.e., militarization of climate change, gap in Arctic studies, the ongoing nature of the Arctic strategy-making process).

<sup>211</sup> Unclassified reports (UCP are classified documents).

<sup>212</sup> In the temporal framework here taken into consideration, NATO has not expressed relevant considerations for the purposes of the chapter. On its approach to climate change see for example Rasmussen (2009. The speech draws on CNA 2007) and, to a lesser degree, the 2010 Strategic Concept (NATO 2010). Moreover, no agreed-to common position on its role in the Arctic has been achieved (Kochis and Di Pane 2017). Concerning the management of climate change impacts in the North American Arctic by NATO, please see Chapter V.

**Table 4.2. Some examples of the evaluation process of empirical observations from this Chapter.**

Empirical observation	Type of evidence	Contextual knowledge-> Mechanistic evidence
<p><i>“Existing DoD posture is adequate to meet near- to mid-term U.S. defense needs. DoD does not currently anticipate a need for the construction of a deep-draft port in Alaska between now and 2020”</i> (DoD 2011, 3)</p>	account evidence	<p>A rather <i>conservative approach</i> performed by the DoD in 2011 in relation to climate change impacts on national security in the North American Arctic.</p>
<p><i>“To be prepared to address the emerging challenges caused by the opening of the Arctic Ocean waters, this Roadmap recognized that changes in the environment must be continuously examined and taken into account”</i> (TFCC 2014, 19)</p>	account evidence	<p>From the part of the Navy in 2014, <i>full acknowledgment</i> of the link climate change-Arctic security as well as its challenges for planning,</p>
<p>No release of an Arctic strategy by the Army and the Air Force</p>	e-silentio evidence	<p>Absence of non-maritime services in the identification process in the considered timeframe.</p>

Source: own elaboration based on Beach and Pedersen (2013).

### **3. Close to the melting ice: the path led by the US Navy (1990-2014)**

The assessment of the existence itself of global warming and its effects in the North American Arctic is the necessary first step of the identification process. In geopolitical terms, it was necessary to identify the very fact that the operational milieu was changing. This was a remarkable novelty for national security planning, as demonstrated by the general posture of the national security community addressed in Chapter III. While pre-2007 context proved to be unable to trigger the mechanism, in the meanwhile the Navy has been the first among the selected actors identifying the link between climate change and operability, also in the Arctic, and on this basis, as it will be seen, it has been possible for the President and the DoD to draw also on those insights and incorporate them in grand strategy until the acknowledgment of the impacts on homeland defense.

As a starting point, the analysis will outline the interconnections between the Navy and the scientific community in dedicated *fora* (par. 3.1). Then, it will be presented how climate change has been identified as a threat multiplier in national security planning by actors close to the maritime domain (par. 3.2). Finally, the relevance of the initiatives undertaken by the Navy on adaptation *before* the incorporation of climate change into grand strategy will be discussed (par. 3.3).

### 3.1 Pre-2007 analysis of climate change impacts on Navy's operability through military-scientific cooperation

Climate change entered in US geostrategy relatively late despite the military origins of research on global warming. During the Cold War, the military heavily funded geophysical research, including research on carbon dioxide levels in the atmosphere, because of urgent and contextual security concerns. The first systematic research confirming the increase of carbon dioxide levels in the atmosphere – the so-called Keeling Curve graph (1976) – was indeed a product of the Scripps Institution of Oceanography project for military objectives, such as weather modification, nuclear-test detection, and nuclear fallout (Howe 2014, 17-18). Charles Keeling's research, as well as the studies by Roger Revelle on the monitoring of atmospheric constituents which demonstrated the anthropogenic causes of global warming, were indeed true "children of the Cold War" (Howe 2014, 39) grown up through military funds. Scientific global warming research eventually distanced itself from its origin thanks also to the worldwide cooperative climate stemmed out of the International Geophysical Year 1957-58 (Collis and Dodds 2008). Since that moment, global warming and climate change have merged progressively with international forums and national and local mitigation politics.

In this scenario, the US Navy constituted an exception. The Navy procedures for monitoring and charting sea ice conditions began in 1948, through reconnaissance flights and three years later, in 1951, the Navy launched an ice-observing and forecasting program (Doel *et al.* 2014, 70). To gather more data on the warming of the Arctic, the Navy established a partnership with Canada, starting an intensive collaboration with the Defense and Research Board (DRB) to expand the network of Arctic observing stations to report on sea ice conditions. As reported by Doel *et al.* (2014, 70), "[I]n 1952, DRB Arctic section head Rowly, noting that average ice thickness in the far north had decreased from 364 centimeters in 1893-1896 to just 218 in 1937, declared that ice-free Arctic summers might become a reality in just twenty to thirty years". The statement was shared by both Central Intelligence Agency analysts and DRB officials (Doel *et al.* 2014, 70), but those conclusions were not included at higher levels of strategy.

During the Cold War, the Navy remained actively deployed in the Arctic, but since the end of the Cold War, its surface presence has massively decreased (Bowes 2009, 24). There are however proofs to assess that the Navy was analyzing the effects of global warming on national security in the 1990s, as far as the Navy's operability was concerned by climate change. In May 1990 the Naval War College issued a paper on the effects of climate change on naval operations. The paper, by Terry P. Kelley - a resident student at the US Naval War College (probably under the supervision of Dr. John B. Hattendorf)<sup>213</sup> - contains the findings of research allegedly part of an *Advanced Research Program* of that time.

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<sup>213</sup> Author's correspondence with an archivist at the US Naval War College, 15/07/2020.

The starting point of the document is the assessment of what climate change is<sup>214</sup>. Then, impacts of climate change are individuated in coastal installations' vulnerability to sea level rise<sup>215</sup>, and modifications of operational and systems environments across the entire battle volume due to heating in both surface and low atmosphere (Kelley 1990, 16). Benefits envisaged in the study were the decrease of the polar ice cap leaving "much larger areas of clear water, scattered broken ice, and fewer and more shallow ice keels" (Kelley 1990, 17), and "fewer false targets to active sonar prosecution, more effective submarine on submarine engagement expectations, as well as a less hospitable environment for hiding and operating ballistic missile submarine may result" (Kelley 1990, 17). A freer sea would have also tactical advantages for submarine warfare thanks to a "more energetic and turbulent ocean environment" (Kelley 1990, 19). Storm intensity increase (Kelley 1990, 16) may rise also the ambient or background noise (Kelley 1990, 20) and affect naval vessels and associated equipment: indeed, "a more energetic sea would increase the size of the splash zone or wetted area, thus, increasing corrosion control design requirements" (Kelley 1990, 22). While the human role in global warming was not questioned in the paper, the report clearly stated that climate change was causing both threats and opportunities to the Navy. According to the author's study, the connection between climate change and naval operations is to be found in the impacts of the environment on the Navy, as almost every naval operation depends (positively or negatively) on some aspect of the environment (Kelley 1990, 16). Moreover, urgent action was necessary to avoid further costs at the stake of the Navy's operability (Kelley 1990, 2). The report by the Naval War College is almost a *unicum*.

Despite a gap in mechanistic evidence concerning the 1990s, the existence of the engagement of the Navy on the study of the effects of global warming is proven by the holding at Washington D.C. of a Symposium on April, 17-18 2001 presenting for the first time a shared vision for naval operations *in an ice-free Arctic*<sup>216</sup>. The organization of the symposium scheduled the participation of a great number of actors close to the Navy and the Arctic: the Office of Naval Research, the Naval Ice Center, the Oceanographer of the Navy, the Arctic Research Commission, as well as representatives of the Navy, Coast Guard, Canadian armed forces, Royal Navy, and members of the scientific community.

The central point of the symposium was that

"[V]essels and aircraft operating in the Arctic have reported diminished summer ice coverage and scientific models consistently suggest that seasonal sea lanes through the formerly ice-locked Arctic may appear as

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<sup>214</sup> Detailed scientific data is provided in the appendix of the document (Kelley 1990, Appendix I).

<sup>215</sup> King's Bay, Pascagoula, New Orleans, San Diego, Little Creek (US Naval War College 1990, 12).

<sup>216</sup> An initial meeting was held at the National Ice Center on July 7, 2000.

soon as 2015. It is postulated that summertime disappearance of the ice cap could be possible by 2050 if this trend continues. The implications for national security and by extension, the impact on naval operations, are significant” (Office of Naval Research *et al.* 2001, 7).

In this panorama, the main objectives were still traditional objectives to US national security, such as free access to global commons, also in the Arctic, through new capabilities for air, space, surface, and subsurface operations and support (Office of Naval Research *et al.* 2001, 3). To fulfill those objectives in an ice-free Arctic, however, it was necessary to reconsider alternative formations, namely “tailored forces packages” in the form of task forces replacing traditional carrier battlegroups (Office of Naval Research *et al.* 2001, 31).

The symposium was centered more on the technical requirements needed by the Navy than on the implications of an ice-free Arctic on US national security. Three purposes were indeed envisaged for the new operating *modus operandi*: an increased economic activity entailing more intense environmental protection activity, an increased need for law enforcement (to be performed not only by civilian law enforcement authorities, but also by military forces acting under the UNCLOS to prevent counter-drug operations and migrant smuggling), and increased security needs “resulting from the opportunities of potential adversaries to exploit the waters of the Arctic in ways that are counter to our national security” (Office of Naval Research *et al.* 2001, 34).

Nevertheless, the symposium is precious proof of the existing adaptation process sponsored by the Navy; moreover, it is proof of the fact that in 2001 there was growing awareness on the necessity of operating in an ice-free Arctic in 2040-2050. But in the absence of further evidence (no significant reports were released to the public, and climate change was not even incorporated into official doctrine), it is also a matter of fact that such a trend was restricted to forums involving the oceanographic community knowledge also shared by the Navy and the Coast Guard. In fact, the final report of the Symposium acknowledged that

“[T]he operational implications of an ice-free Arctic are neither well known nor well appreciated outside the oceanography community. Significant research and a subsequent education/awareness plan is required to inform all stakeholders including requirements officers, acquisition executives, and operators. This is essential to produce the level of naval service interest required to make informed decisions about future extended operations in the polar seas.” (Office of Naval Research *et al.* 2001, 3).

This statement is consistent with the general climate of disregard of climate change in national security before 2007. As demonstrated in the previous Chapter, while it is true that in those years some actors were engaged in the analysis of climate change impacts on national security (not only in the Arctic, as proven by the global perspective presented in the report by Schwartz and Randall), it cannot be denied that the 2001-context was not able to trigger the actual mechanism of adaptation, since initiatives beyond the cooperation

between the scientific and maritime community were absent as well as comprehensive arguments on the impact of climate change going beyond pure adaptation to changing conditions at the operational level. In the 2001 context, an initiative like the 2001 Symposium being completely centered on adaptation to climate change, did not have resonance outside the Navy's framework. Nevertheless, as it will be seen later, it provided a priceless basis for the continued engagement of the maritime services in the process of identification (and adaptation) to climate change.

Further proof came in 2003, by the words of Rear Admiral Richard F. Pittenger<sup>217</sup> and Robert B. Gagosian<sup>218</sup>. The two oceanographers divulged global warming implications on national security through an article published on "Defense Horizons"<sup>219</sup>. The article focuses on the description of the effects of global warming on the oceans, stressing the fact that the ocean conveyor is the "Achilles' heel in the climate system" (2003, 2), in particular in the North Atlantic. "In the Arctic Ocean Basin," they explain,

"cold air temperatures freeze seawater into sea ice. This releases salt into surface waters, which become denser and sink. The process creates a thin layer of sea ice and fresh water at the surface—above a layer of denser, saltier waters, known as a halocline.

The halocline provides a barrier to mixing that would otherwise bring deeper, warmer waters in contact with the sea ice cover. The heat content of this deeper water is sufficient to melt the ice from below, adding an influx of fresh water that could flood the North Atlantic and disrupt the Conveyor" (2003, 4).

It follows that "global warming is a destabilizing factor. It may increase direct melting of sea ice and glaciers, and it also may be accelerating the cycle by which water evaporates and precipitates on Earth's surface" (2003, 4). The identified physical and social consequences relevant for national security in the Arctic are numerous, as much as the necessary responses: different acoustic propagation (deriving from windier conditions) will demand adjustments on tactical platform sensors; a general re-invention of now-casts and forecasts (which were not including abrupt climate change); a stormier Atlantic Ocean increasing the hazard of Navy's operations in the Arctic; frozen harbors jeopardizing base operability even in major naval bases, such as Norfolk; the shift from warfighting in dry or hot conditions to cold-weather operations (2003, 6). Beyond the North Atlantic, the authors envisage the opening of new naval routes in an ice-free or navigable Arctic Ocean; a new scenario for naval operations, where the melting of ice will make submarines more detectable, given the failure

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<sup>217</sup> Vice president for Marine Operations at Woods Hole Oceanographic Institution, and former oceanographer of the Navy and director of antisubmarine warfare.

<sup>218</sup> Oceanographer and director of the Woods Hole Oceanographic Institution.

<sup>219</sup> "Defense Horizons" is the journal of the National Defense University, Washington DC.

of the ice canopy, active sonar detection, and acoustic torpedoes; changes in acoustics; shorter maritime routes, surpassing, for example, the Panama Canal; a need for more ice-capable ships for operating in a more viable, but still iced, region.

The article by the two oceanographers fits well the context here identified for two reasons. The first is that it points to the fact that consequences of global warming on national security are usually neglected with respect to its implications on economic issues. The second is that it delves into explaining why *this* climate change has to be considered *abrupt*. This latter, in particular, is in line with Schwartz and Randall (2003) and demonstrates how a concept that today is taken for granted had to be illustrated, at least in the national security domain, as a novel and worrisome feature of the “climate change problem”. The article’s findings are that

“[M]ost signs (...) indicate that military planners are going in the opposite direction, assigning research and planning on climate change a low priority. That is a gamble. The challenge to military leaders is to reduce vulnerabilities by enhancing our ability to monitor, plan for, and adapt to rapid change. Ignoring or downplaying the probability of abrupt climate change could prove costly. Some current policies and planning—or lack thereof—may be ill-advised and may prove inadequate in a world of rapid and unforeseen climate change” (2003, 8).

In conclusion, on the basis of the gathered evidence it results that it was thanks to the connection between scientific agencies and maritime services<sup>220</sup>, both providing valuable data on the ice thickness to the Navy, that the Navy was able to identify significant advantages and disadvantages to its operability in the Arctic. With respect to other services, or to the DoD <sup>221</sup>, the Navy began its path towards the assessment of the impacts of climate change on national security already in 1990-2000. However, during that period, no other step was taken outside scientific-related forums by other services or in general by other actors, DoD included. To trigger that moment, as demonstrated previously, a more stimulant context

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<sup>220</sup> A further proof is given by the publication on *The Journal of Strategic Studies* of a study by Gary E. Weir, at the time head of the US Navy’s Naval History and Heritage Center’s Contemporary History Branch and Guest Investigator at the Woods Hole Oceanographic Institution (2005). In a study on Cold War under-ice operations in the Arctic, Weir focused on the role played by the ice cap in the confrontation between the two superpowers. His study contains also a reflection on the effects of climate change on contemporary Arctic naval strategy.

<sup>221</sup> As it was seen, in 2003 the DoD dismissed or apparently neglected the report by Schwartz and Randall. Moreover, the absence of other armed services beyond the Navy and the Coast Guard is remarkable. For example, a report by the Air War College dedicated to weather operations (Lanicci 2003) and issued in 2003, touches climate change only in an indirect way.

deriving from a changing posture on environmental issues coming from other actors (international organizations, domestic politics, civilian mobilization) was necessary.

### **3.2 Climate change as threat multiplier in the 2007 context**

While the period 1990-2000s generally marked a stasis in the identification, since 2007 actors more familiar to the public began picturing climate change impacts on national security. In 2007 the Center for Naval Analyses (CNA)<sup>222</sup> Military Advisory Board made climate change a matter of national security through the release of a public report which soon became considered a notable and respected document on the threats posed by climate change, given the number and the prestigious *curricula* of its authors (eleven among retired generals and flag officers). The Military Advisory Board<sup>223</sup> indeed consists of retired three- and four-star flag officers and generals from all services, including service chiefs and regional combatant commanders. In the report, the Military Advisory Board members presented their own views, based on their personal experience of various security implications of climate change in the world. It is common ground, also sustained by institutional figures involved in the process, to consider the CNA Report of 2007 as the very starting point of US recognition of the impacts of climate change on national security. Given the previous scarce attention to the issue (on the basis of what has been argued in the previous paragraph and Chapter III on contextual factors), this statement has sense.

To publish the report, the CNA Military Advisory Board and its study team received briefings from the intelligence community, climate scientists, business and state leaders since 2006, the year in which work for the report started. Members traveled to the United Kingdom to meet high-level government and business leaders to learn about the actions the United Kingdom was taking to address the threat of climate change (CNA 2007, 9). Among those that provided scientific insights and reviewed the report, there were also Dr. Fiona Horsfall of the National Oceanic and Atmospheric Administration (NOAA) and Rear Admiral Richard Pittenger of the Woods Hole Oceanographic Institution. This latter, as mentioned, was one of the authors of the article published on “Defense Horizons” in 2003.

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<sup>222</sup> The CNA is a non-profit research and analysis organization, federally funded, serving principally the Department of Navy and the Marine Corps.

<sup>223</sup> At the moment of the release of the 2007 Report, the Military Advisory Board components were: General Gordon R. Sullivan (chairman of the Military Advisory Board, former Chief of Staff, US Army), Admiral Frank Bowman (retired), Lieutenant General Lawrence P. Farrell Jr. (former Deputy Chief of Staff for Plans and Programs, Headquarters US Air Force), Vice Admiral Paul G. Gaffney (Former Chief of Naval Research and Commander, Navy Meteorology and Oceanography Command), General Paul J. Kern (Former Commanding General, US Army Material Command), Admiral T. Joseph Lopez (Former Commander-in-Chief, US Naval Forces Europe and of Allied Forces, Southern Europe), Admiral Donald L. Pilling (Former Vice Chief of Naval Operations), Admiral Joseph W. Prueher (Former Commander-in-Chief of USPACOM), Vice Admiral Richard H. Truly (former NASA Administrator and first Commander of the Naval Space Command), General Charles F. Wald (Former Deputy Commander, Headquarters USEUCOM), General Anthony C. Zinni (Former Commander-in-Chief of USCENTCOM).



The report is characterized by a comprehensive account of the possible impacts of climate change on national security, emphasizing climate change as threat multiplier, especially in “the most volatile regions of the world” (CNA 2007, 6). It is clearly stated (CNA 2007, 11) that “[A] global average temperature increase of 1.30 F (plus or minus 0.30 F) occurred over the twentieth century” and the predicted effects of climate change, including “extreme weather events, drought, flooding, sea level rise, retreating glaciers, habitat shifts, and the increased spread of life-threatening diseases” (CNA 2007, 6), are cataloged according to their impacts on national security. This latter is defined as “geo-strategic balances and world events that could likely involve U.S. military forces or otherwise affect U.S. strategic interests anywhere in the world” (CNA 2007, 9). The predicted effects of climate change, the report points out, have *destabilizing impacts* (reduced access to fresh water, impaired food production, health catastrophes, displacement of populations) which have then *security consequences* (greater potential for failed states, growing terrorism, mass migrations, escalation of conflicts over resources). Impacts are then mapped on a global scale (Africa, Asia, Middle East, Europe, and Western Hemisphere) following the studies, comments, and impressions of the Military Advisory Board members.

One of the most important features of the report is that of addressing also impacts on developed countries – a point that was absent in previous mentions of climate change impacts in defense documents<sup>224</sup>. Concerning the US, the report assesses that primary security threats derive from the increasing demand for humanitarian aid and migration flows to the US (CNA 2007, 32), confirming the thesis of climate change *in primis* as global threat multiplier. In addition, the US will also deal with climate change issues on its territory (CNA 2007, 32): shortages in food production, water stress, and flooding. A section is dedicated to the direct impacts of climate change on weapons systems and platforms (increasing maintenance requirements in extreme environmental conditions), bases threatened by rising sea levels (both at home and abroad), military operations (being readiness affected by extreme weather events), but generally, the report stays focused on the complex interrelations of threats coming from less resilient states, such as terrorism, increasing migrations flows to the US and the potential escalation of humanitarian and disaster relief interventions<sup>225</sup>.

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<sup>224</sup> On this, please see Chapter 3, par. 4.1.

<sup>225</sup> “[T]he greater problem for the U.S. may be an increased flow of migrants northward into the U.S.” coming from south (Mexico) to north (US) states the report (CNA 2007, 34). With respect to the impacts on the Arctic, the report says that climate change “will require an “increased scope of naval operations” (2007, 35) and “[T]hat increased scope of operations will require the Navy to consider weapon system effectiveness and various other factors associated with operating in this environment. Additionally, an Arctic with less sea ice could bring more competition for resources, as well as more commercial and military activity that could further threaten an already fragile ecosystem” (2007, 38).

In the CNA report, there is indeed no *major* content that can support the thesis of the impacts of climate change on the territorial integrity of the US. Nevertheless, since its release numerous steps have been taken. According to Sherri Goodman<sup>226</sup> (the CNA Military Advisory Board Director at the time), the CNA findings have progressively stimulated the DoD, thanks also to the continuous release of research by the CNA itself on climate change (CNA 2009; CNA 2010). Additional stimuli for the DoD then came from the United Nations (UN General Assembly 2009, A/64/350) and national intelligence (National Intelligence Council 2008). All these documents, it should be pointed out, have in common the general perspective on climate change as threat multiplier and they refer to the IPCC 2007 report as a source of the unequivocal nature of global warming.

In this regard, two documents are particularly worthy of analysis, as they were developed beyond strict climate change-related forums: the *Cooperative Strategy for the 21<sup>st</sup> Century Seapower* (October 2007) and the *Joint Operating Environment* (December 2007). The *Cooperative Strategy* is a notable effort in joint cooperation by maritime services (i.e., the Navy, the Coast Guard, and the Marine Corps). The strategy aims at developing a post 9/11 approach (shaped by post-modern models, according to Till) in which military action is carefully integrated with political and economic approaches (Till 2008, 25) by adapting the military's role to the scope and scale of new threats, aggravated by the complexity of globalization and the impressive rate of change (Till 2008, 26). Among the new challenges to joint operations for sea services, there is also the problem of climate change and the melting Arctic. The issue is here expressed in terms of climate change "gradually opening up the waters of the Arctic" with positive consequences over new resource development and new shipping routes reshaping the global transport system, but bringing also the possibility of competition (and even conflict) for access and natural resources (US Navy, US Marine Corps, US Coast Guard 2007). Also worthy of mention is that in December 2007 the *Joint Operating Environment*<sup>227</sup> devoted considerable space in comparative terms to climate change (US Joint Forces Command 2007, 10-11). Here, climate change - whose novelty in terms of anthropogenic cause is strongly underlined - is presented mainly as threat multiplier, resulting in "multiple chronic conditions, occurring globally within the same time frame" (US Joint Forces Command 2007, 11). Impacts on the homeland are then identified in refugee flows, internal weather-related disasters, energy crises, terrorism, and military capability (trafficability, flooding of military ports and bases, sensor performance) (US Joint Forces Command 2007, 11). Concerning the Arctic, strategic implications, it is argued, include the opening of new sea routes, access to new resources, and "tensions" over energy resources, all resulting from the melting of the ice cap (US Joint Forces Command 2007, 11). It is possible that the attention given to climate change derived from the enduring awareness of Gen.

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<sup>226</sup> Interview with Sherri Goodman (15/06/2020).

<sup>227</sup> The *Joint Operating Environment* of 2007 draws on findings of the 2007 CNA Report (US Joint Forces Command 2007, 11).

James Mattis (at the time serving as Commander of the US Joint Forces Command) to climate change impacts on national security<sup>228</sup>.

It is worth stressing that neither document was conceived to deal expressively with climate change. However, they are valuable since they purposefully include climate change and its impacts on the Arctic (the Joint Forces Command even underlined its anthropogenic origins) in national security planning. Both draw on previous knowledge elaborated by the CNA itself and, retrospectively, through the connection with the scientific community. They are also mostly centered on the conceptualization of climate change as threat multiplier, with mentions to the impacts on the homeland in terms of military base resilience. In that respect, the issues associated with the melting Arctic are the opening of new sea routes, increasing access to resources, and potential conflict as a consequence.

### **3.3 Reducing uncertainty for response: the 2008 NDAA and TFCC Arctic Roadmaps**

After the initiatives that culminated in 2007, 2008 was a year of transition shaped by the National Defense Authorization Act (NDAA) for Fiscal Year 2008, the federal law authorizing the DoD's annual budget. 2008 NDAA, indeed, draws on insights from think-tanks reports (i.e., CNA, CSIS), proving the strong interconnection between non-institutional and institutional actors, as well as the value of the CNA report in shaping national security awareness to non-traditional issues, transpiring also in congressional speeches preceding the enactment of the act (Diez, von Lucke, and Wellmann 2016, 59-60). Most importantly for the empirical process, the 2008 NDAA formally asked DoD to include climate change impacts on missions and assets: the act required the next *Quadrennial Defense Review* (QDR), the *National Security Strategy*, and the *National Defense Strategy* to assess the consequences of climate change on military missions, by updating defense plans and developing capabilities for reducing future impact. In particular, preparedness for natural disasters deriving from extreme weather events, both domestically and internationally<sup>229</sup> is emphasized. The act stresses also the reliance on scientific models as guidance for drafting<sup>230</sup>.

At the beginning of the process shaped by the 2008 NDAA, the national security panorama featured only scattered mentions of climate change. The 2008 *National Defense Strategy* did not dedicate much space to climate change impacts (Department of Defense 2008, 4-5). At the operative level, it is worth mentioning that the *Joint Operational Environment* of 2008, released under Gen. James Mattis, still Commander of the US Joint Forces Command, identified possible climate change impacts in the form of natural disasters

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<sup>228</sup> Gen. Mattis' commitment to climate change as Secretary of Defense has been demonstrated since 2017 (see also Werrell and Femia 2017).

<sup>229</sup> 2008 NDAA, sec. 951, 2.

<sup>230</sup> 2008 NDAA, sec. 951, 3.

and sea level rise, and envisaged a growing need for US assistance at the international level in states hit by extreme weather events – be they caused by global warming or not (US Joint Forces Command 2008, 21)<sup>231</sup>.

A new major step was then taken by the Navy. In this respect, the timeline is extremely important, as the sequencing of the release of the documents here analyzed demonstrates further that the Navy’s engagement has developed almost independently from the President and the DoD. Indeed, contrary to what is usually known, the Navy’s Task Force Climate Change (TFCC) originated as a pre-Obama initiative: Admiral Gary Roughead asked Admiral Dave Titley to establish the TFCC in 2008<sup>232</sup> (thus, before the enactment of 2008 NDAA in January 2008), a step that was then unveiled in 2009<sup>233</sup>. On May 15, 2009, during the Chief of Naval Operations<sup>234</sup> (CNO) Executive Board, convened by Admiral Roughead, the Navy’s TFCC was then officially established.

The primary purpose of the TFCC was that of developing an *Arctic Roadmap* which should have been “synchronized with a science-based timeline,” providing “a framework for how the Navy discusses the Arctic” through the drafting of a list of objectives tempered by fiscal realities (Department of the Navy 2009). The main purpose of the TFCC was thus to

“recommend policy, strategy, roadmaps, force structure, and investments for the Navy regarding the Arctic and Climate Change that are consistent with existing National, Joint, and Naval guidance, including *National Security Presidential Directive/Homeland Security Presidential Directive (NSPD-66/HSPD-251)*, *Joint Vision 2020*, and a *Cooperative Strategy for 21<sup>st</sup> Century Seapower (CS21SP)*” (Department of the Navy 2009, 2).

The TFCC, led by the Oceanographer of the Navy (representing here the connection between science and the military), who oversees the execution of the roadmap (at the time of its establishment, Adm. Titley), operates thanks to the cooperation of the Office of Naval

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<sup>231</sup> See also 2010 *Joint Operating Environment* signed off by Mattis as Commander of the Joint Forces Command (US Joint Forces Command 2010, 32-33).

<sup>232</sup> Being at the time (2007) Adm. Roughead the Chief of Naval Operations and Adm. Titley Chief Oceanographer of the Navy.

<sup>233</sup> As reported by Frank Femia, Director and Senior Advisor of the International Military Council on Climate and Security (Milan/Washington, 26/05/2020), on the basis of a previous colloquium with Adm. Roughead and Adm. Titley.

<sup>234</sup> The Chief of Naval Operations (CNO) is a four-star admiral “responsible to the Secretary of the Navy of the command, utilization of resources, and operating efficiency of the operating forces of the Navy and of the Navy shore activities assigned by the Secretary”. The CNO is also the principal naval adviser to the President and the Secretary of the Navy. ([https://www.navy.mil/navydata/leadership/cno\\_resp.asp](https://www.navy.mil/navydata/leadership/cno_resp.asp))

Research, the Coast Guard, the NOAA, the Office of Naval Intelligence and the National Maritime Intelligence Center plus numerous advisory participants, such as the Geographic Combatant Commands, the Office of the Secretary of Defense, the Chairman of the Joint Chiefs of Staff, the CNA and the Departments of Homeland Security, Commerce, Interior, State, and Energy (TFCC 2010, 5). It aims to make recommendations to Navy leadership concerning policy, strategy, force structure, and investments relating not only to the changing Arctic but also to climate change generally (TFCC 2010, 5).

Two projects were planned at the establishment of the TFCC: an *Arctic Roadmap* and a *Climate Change Roadmap*. In November 2009, the Vice Chief of Naval Operations approved the *Arctic Roadmap* (Titley and St. John 2010), the first initiative of the TFCC. The starting point of the *Arctic Roadmap* is that

“[T]he Arctic is warming twice as fast as the rest of the globe. While significant uncertainty exists in projections for Arctic ice extent, the current scientific consensus indicates the Arctic may experience nearly ice free summers sometime in the 2030’s” (TFCC 2009, 6).

According to the *Roadmap*, the changing environmental conditions may provide both competition for resources contributing to increase tension in the region and “provide opportunities for cooperative solutions” (TFCC 2009, 6). The roadmap is then articulated into three phases (*Fiscal year 2010, Fiscal year 2011-2012, Fiscal year 2013-2014*) and for each is presented a “desired effect-objective-action item” scheme, specifying for each effect/objective its particular description, the lead, support, and suspense for each action. Focus areas concern *strategy, policy, missions, and plans; operations and training; investments in weapons, platforms, sensors, C4ISR<sup>235</sup>, installations and facilities; strategic communications and outreach; environment assessment and prediction.*<sup>236</sup>

The attention devoted by the Navy to the monitoring of the ongoing effects of climate change is demonstrated by the updating of its Arctic strategy<sup>237</sup>. In February 2014 the Navy published a new edition of its *Arctic Roadmap* under the framework of TFCC, stating that the Arctic conditions made the typical functions of the Navy more challenging than in other theatres (TFCC 2014, 3). This has led to a revision of the original strategy also at the light of the release in 2013 of the presidential Arctic strategy by Obama and the following

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<sup>235</sup> C4ISR stands for “Command, control, communications, computers, intelligence, surveillance, and reconnaissance”.

<sup>236</sup> Following the release of the Arctic strategy, as planned by the TFCC, a roadmap for climate change adaptation was released in 2010, this time within the framework of the 2010 QDR. For what concerns the Arctic, the *Climate Change Roadmap* (2010) refers to the 2009 Arctic Roadmap.

<sup>237</sup> After the 2014 version of the *Arctic Roadmap*, the Navy released its following Arctic strategy in 2019 (please note that the 2019 *Strategic Outlook for the Arctic* was not a product of TFCC. This point will be developed furtherly in Chapter VI).

*Arctic strategy* by the DoD, which made the TFCC refine its strategic objectives according to those prescribed by the aforementioned strategies. The 2014 version presents an Implementation Plan (TFCC 2014, Appendix 3) and at the same time assesses the accomplished actions from the 2009 *Arctic Roadmap* (TFCC 2014, Appendix 2).

The 2014 *Roadmap* indeed pursues a careful assessment of the constraints on strategic planning, re-stating the geopolitical shift due to increased human activity in the Arctic. Arguably, in a region where human presence is increasing and according to future scenarios is supposed to increase, even more, a stronger naval presence will be probably still confined to summer months where the sea ice is near its minimum, and regional activity is at its peak (US Navy 2014, 7). Even

“in areas that are seasonally free of ice, the ability of commercial and military vessels to maneuver will remain significantly hindered due to unpredictable locations and movement of ice formations as well as the inadequate and incomplete nautical charting and aids to navigation in many portions of the Arctic Ocean” (US Navy 2014, 8).

However, the *Roadmap* argues that those geographical constraints should not prevent the Navy from ensuring persistent domain awareness and response capacity to adversaries in virtue of an all-year homeland defense missions (TFCC 2014, 7) and to monitor the future importance of the Bering Strait as “an important chokepoint for surface and subsurface vessels entering or departing the Arctic Ocean” (TFCC 2014, 6), due to its relative importance for Russia since the strait connects its naval forces (Asian and European). This is a near-term scenario, however. In the far-term challenges are expected to increase: the Navy envisages a scenario where the Arctic ocean is ice-free, and as the reduction of sea ice is expected to continue, waterways such as the Transpolar Route and the Northwest Passage will no more limited to 30-45 days periods, but they may become navigable for 130 days per year (TFCC 2014, 12). Actions to cope with these scenarios are identified by the *Roadmap* according to the usual timeframe.

#### **4. The inclusion of climate change in presidential Arctic strategies**

The following paragraph will be devoted to the reconstruction of the identification process at the presidential level. For this reason, the sources here analyzed will be expressions of the US President's position on climate change effects on the North American Arctic as far as they are related to national security. Arctic strategy was first developed through presidential directives, a tool usually addressed to inner circles. The reconstruction will prove that the recognition of climate change impacts on national security in the Arctic took place *after* 2007 (confirming thus the validity of contextual frameworks detected so far) and *after* the path led by the Navy which was presented in the previous paragraph. It will be demonstrated how progressively Arctic strategy has been articulated within a cooperative framework where national security was not much more than a mention (par. 4.1) until the

release of the directive on Arctic policy in 2009, which stated that increasing human activity due to climate change was affecting US national security interests (par. 4.2).

#### **4.1 Pre-2009 directives: a new climate of cooperation in the Arctic**

The first step in the reconstruction of the identification process at the presidential level should be pursued through the analysis of national security directives. Presidential directives are a precious tool for reconstructing intentions, orders, and requests for information by the President since they are usually not intended for divulgation and they circulate within a restricted circle of security planners. A directive is indeed a form of presidential communication delivered to his staff and sometimes to the nation, falling within the category of the tools at presidential disposal for prescribing policy for the executive, including also orders, proclamations, memoranda, executive agreements, signing statements (Gordon 2007, 349). The general purpose of national security directives is thus to “provide a formally structured process to coordinate U.S. foreign and military policies and advise the president on national security matters” (Gordon 2007, 351).<sup>238</sup> As far as directives dealing with the Arctic have been declassified, they provide valuable evidence of the Arctic *psychomilieu* of presidents – their secretive nature indeed reinforces their weight, despite their limits.

The beginning of formal presidential American engagement in the Arctic can be attributed to the National Security Decision Memorandum (NSDM) release 144 by Henry Kissinger on December 22, 1971 (declassified in 1977). The directive is a valuable piece of evidence since it has been conceived as a classified document. As such it proves that in the 1970s there was no special focus either on security issues in the Arctic or climate change effects. President Richard Nixon, through the words of Kissinger as his Secretary of State and following the NSC (National Security Council) Under Secretaries Committee’s recommendations, expressed his support for “the sound and rational development of the Arctic” (NSC 1971, 1). In accordance with such spirit, the NSDM-144 founded the Interagency Arctic Policy Group<sup>239</sup> and approved the development of a coordinated plan for scientific research with other countries’ cooperation. As it can be noted, the approach of NSDM-144

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<sup>238</sup> Almost every president changed his form of communication to the staff as well as the typology of the security directives. A major but unescapable problem arises as, contrary to executive orders, NSPDs are classified. According to GAO “of the 1,042 presidential security directives issued between 1961 and 1988, only 247 were publicly released” (US GAO 1988, 2); Vikki Gordon (2007), estimates that from 1961 to the present 1,327 NSDs have been issued in total (1,790 including HSPDs). A good collection of presidential directives can be found on the website of the Federation of American Scientists ([www.fas.org](http://www.fas.org)), but it should be remembered that many national security directives are still classified and are not accessible to the public. Accessibility was further restricted on November 1, 2001, by Executive Order 13233 by George W. Bush

<sup>239</sup> The Arctic Policy Group is composed of the DoD, Interior, Commerce and Transportation, the National Science Foundation, the Council on Environmental Quality and representatives of other agencies. It is chaired by the Department of State.

strongly reflects a cooperative and multilateral environment in line with contemporary liberal and constructivist IR literature, where security interests (even in the unclassified version) are limited to the “preservation of the principle of freedom of the seas and superjacent airspace” (NSC 1971, 1). The directive also charges the NSC Under Secretaries Committee to promote a cooperative approach: it is its task to

“review and forward detailed action programs, including plans and specific projects (with budgetary implications as appropriate), for increasing mutually beneficial cooperation with Arctic and other countries in areas such as exploration, scientific research, resource development and the exchange of scientific and technical data; for improving the US capability to inhabit and operate in the Arctic and the understanding of the Arctic environment; and for developing a framework for international cooperation with particular attention given the Northlands Compact approach<sup>240</sup>” (NSC 1971, 1).

The cooperative attitude resulting from NSDM-144 was then enhanced with the approval of the 1984 *Arctic Research and Policy Act* and the participation of the US to key Arctic governance institutions since their very foundation: the *Arctic Environmental Protecting Strategy* (adopted in 1991), a non-binding agreement among the Arctic states, and the Arctic Council (1996), an intergovernmental forum promoting cooperation in the Arctic.

Slightly more emphasis on national security implications was expressed under Reagan presidency in the *National Security Decision Directive 90* (NSDD-90) released in 1983 (declassified in 1998). In NSDD-90 the first “major element” of US Arctic policy became “protecting essential security interests in the Arctic region, including preserving the principle of freedom of the seas and superjacent airspace” (White House 1983, 1), followed by the support of sound and rational development in the region, the promotion of scientific research and international cooperation (White House 1983, 1). The Interagency Arctic Policy Group became then responsible for reviewing and coordinating the implementation of the policy (White House 1983, 1). Despite the dilemma deriving from constraints between multilateral cooperation and the preservation of US interests (White House 1983, 2), national security implications for the Arctic are limited to the preservation of global commons. The Arctic remains an experimental place for international cooperation in terms of environmental protection, scientific research, commerce, international law and search and rescue operations (White House 1983, 2).

Presidential Arctic policy did not significantly change after the end of the Cold War. *Presidential Decision Directive NSC-26* by Clinton (White House 1994) mostly re-states previous objectives. While among the six objectives presented in the directive, the “meeting of post-Cold War national security and defense needs” (White House 1994, 2) is at the first

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<sup>240</sup> The *Northlands Compact approach* is a model of a legal system for the Arctic discussed in the 1960-1970s, elaborated on the basis of the arrangements regulating Antarctica.



place, only a minor space is dedicated to national security, reflecting basically the protection of global commons and border disputes<sup>241</sup>. Interestingly, the directive envisages the possibility of a direct attack on the US across the Arctic (White House 1994, 2). This event, however, is not related to climate change, instead, it sounds like a reminder of Cold War tensions. The directive is indeed almost entirely focused on other objectives: the protection of the Arctic environment and the conservation of its biological resources, environmental sustainability, the strengthening of international institutions, the involvement of indigenous peoples in the decision-making process, the enhancement of scientific research (White House 1994, 2). This is because

“[T]he new atmosphere of openness and cooperation with Russia has created unprecedented opportunities for collaboration among all eight Arctic nations on environmental protection, environmentally sustainable development, concerns of indigenous peoples and scientific research. In turn, cooperation in these areas will help reduce the risk of a resurgence of traditional threats” (White House 1994, 2).

The directive then addresses the implementation of the objectives in detail, setting out the interinstitutional cooperation framework for institutions both at the domestic level (i.e., Department of Interior, Environmental Protection Agency, NOAA, State of Alaska, the Interagency Working Group on Global Environmental Affairs, local governments and indigenous peoples) and international (i.e., IMO, IAEA, Arctic states).

#### **4.2 NSPD-66 (2009) and the impacts of climate change on the Arctic**

Except for NSDM-144 and NSC-26, among the unclassified national security directives available on the dataset of the Federation of the American Scientists the use of the word *climate change* in the period 1994-2009 appears only in relation to economic policy assistance abroad (Table 4.2). But if the 2007 context made climate change “matter” for national security, it should be expected that after that year also presidential strategy partially reoriented itself towards the identification of the existence of impacts of climate change in the Arctic. And indeed in 2009 the *National Security Presidential Directive (NSPD) 66 / Homeland Security Presidential Directive (HSPD) 25* by Bush Administration, issued on January 9, 2009, has been the first presidential document addressing climate change and

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<sup>241</sup> “We have a strong interest in maintaining peace and stability throughout the region. We must maintain the ability to protect against attack across the Arctic, to move ships and aircraft freely under the principles of customary law reflected in the 1982 Law of the Sea Convention, to control our borders and areas under our jurisdiction and to carry out military operations in the region” (White House 1994, 2).

national security according to a more traditional approach, envisaging also the possibility for independent action for the defense of security interests (White House 2009, 3)<sup>242</sup>.

NSPD-66 presents two significant features for the purposes of this research. The first is that the directive for the first time does not address climate change “just” as a vague environmental problem or uniquely in relation to international cooperation, but instead it states that climate change does impact US security. The focus on national security is evident, despite the fact that a considerable portion of the directive is devoted to other issues (i.e., international governance, boundary disputes, international scientific cooperation, maritime transportation, energy issues, and environmental protection). It is worth noting that those objectives are almost all related to climate change effects (White House 2009, 2), however. The second feature is that the directive locates traditional post-Cold War Arctic policy within a new background, that of exogenous new challenges: terrorism (homeland security) and increasing human activity derived from climate change (protecting the maritime domain and asserting law enforcement in maritime areas).

**Table 4.2. Mentions of climate change in NSPDs in the period 1994-2009.**

<b>PDD-19</b> <b>January 5, 1994</b>	“Environmental Policy on the Multilateral Development Banks and The Global Environmental Facility”
<b>PDD-28</b> <b>September 8, 1994</b>	“U.S. Policy Toward Latin America and the Caribbean”

Source: own elaboration based on the Federation of American Scientists presidential directive database <https://fas.org/jrp/offdocs/direct.htm><sup>243</sup>

The directive identifies national security matters (White House 2009, 3) in *missile defense and early warning; deployment of sea and air systems for strategic sealift, strategic deterrence, maritime presence, and maritime security operations; ensuring freedom of navigation and overflight* (White House 2009, 3). Law enforcement is expected to be furtherly granted since

“[H]uman activity in the Arctic region is increasing and is projected to increase further in coming years. This requires the United States to assert a more active and influential national presence to protect its Arctic

<sup>242</sup> NSPD-66 officially superseded PDD-26 by Clinton.

<sup>243</sup> Analysis performed through *text research query* by NVivo 12 on “climate change”.

interests and to project sea power throughout the region” (White House 2003, 3).

To implement the policy (for both national security and homeland security, as the directive serves both DoD and DHS), it is required to develop great capabilities and capacity to protect US borders, increase maritime domain awareness to protect commerce, infrastructure, and key resources, preserve the global mobility of US military and civilian vessels and aircraft, project a sovereign US maritime presence in support of essential national interests and encourage the peaceful resolution of disputes in the region (White House 2009, 3). In this framework, freedom of the seas remains “a top national priority” (White House 2009, 3)<sup>244</sup>.

As it can be noted from sequence analysis, the presidential initiative came *after* the initiatives by the Navy (2008 was the year in which the TFCC was ideated) and by those of the operative level, which since 2007 had been stressing the impacts that climate change was having on the Arctic. Nevertheless, NSPD-66 gave a fundamental impulse for identification, approving the necessity of the implementation of a policy of defense in the melting Arctic. The path of the operative level, indeed, was limited by its obvious limits to the study of a renewed operability in a changing environmental scenario. In 2009 NSPD-66 included the effects of climate change on national security into a grand strategy landscape made of conflict (law enforcement, border disputes, terrorism) and cooperation (multilateral institutions, scientific cooperation). It did so by expressively identifying the impacts of the increase of human activity in the Arctic region on national security. However, in NSPD-66 those impacts are not treated in detail and much is given to the imagination on the nature of such threats (which terrorist actors, which states could be threatening the US from the north?). In this context, while some inter-agency dialogue cannot be excluded<sup>245</sup>, the release of NSPD-66 seems more like a presidential initiative, not directly directed by DoD or the Navy.

It can also be argued, rightly, that much of this attention to the melting Arctic is derived from the war on terror pursued by the Bush administration. What is certain is that 1) NSPD-66 is a major step in the identification process at the presidential level, since for the first time it has related climate change to national security and that 2) as confirmed also by DoD officials, a further driver (related to climate change) was the increasing threat posed

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<sup>244</sup> Please note that NSPD-66, as well as numerous other documents and statements here reported, calls for the ratification of UNCLOS by the Senate: “[J]oining will serve the national security interests of the United States, including the maritime mobility of our Armed Forces worldwide. I will secure U.S. sovereign rights over extensive marine areas (...) will promote U.S. interest in environmental health of the oceans. And i twill give the United States a seat at the table when the rights that are vital to our interests are debated and interpreted” (White House 2009, 4).

<sup>245</sup> As confirmed by Adm. David Tittle through correspondence with the author.

by Russia perceived by both the President and the Navy<sup>246</sup>. Allegedly, such a threat was due to the ongoing militarization of the Russian Arctic shore, as well as the flag-planting act (2007), aggravated by the outbreak of the Russo-Georgian war (2008).

## **5. DoD: from “reluctant” entity to the release of 2013 *Arctic strategy***

It has been already discussed how DoD has been almost absent in the identification process so far (2009). DoD still did not play a major role in identification at least since 2013-2014, even though it must be noted that some initiatives concerning climate change, such as the *National Climate Assessment* were targeted to a few agencies, among which there was also DoD. As far as identification is concerned, in the post-2007 context DoD posture outlines an interesting puzzle worth attention. The analysis of the DoD path will focus specifically on the moment in which DoD evolved its position on climate change impacts on the Arctic. The paragraph will start by outlining the conservative stance of DoD (par. 5.1) and move to examine the impulse given by the Obama administration, which differ from the Bush administration made climate change a strong political commitment and initiated climate change policy in DoD, firstly through the release of the 2013 *National Strategy for the Arctic Region* (par. 5.2) and then through DoD first *Arctic Strategy* (par. 5.3).

### **5.1 The conservative approach of DoD on climate change impacts on the Arctic**

In the framework presented above, featuring also the continuous engagement by the operative level and in particular by the Navy (which, as it was seen, was following mostly an independent path since the 1990s) the absence of initiatives by the DoD is striking. Since the election of President Obama in November 2008, however, intense attention has been attributed to climate change, not only in terms of domestic mitigation but also in terms of adaptation and national security. As it will be seen, despite the inclusion of climate change in the DoD strategy (2010), the issue of the melting Arctic required several *stimuli* from political actors, *also* based on the evidence presented by the Navy.

During the Obama administration, climate change has been included in major grand strategy documents. In 2010 NSS, climate change figures as a “challenge” for multilateral cooperation (especially for mitigation) and as a threat multiplier at the international level (see for example White House 2010, 47). In 2010, for the first time, following 2008 NDAA, the *Quadrennial Defense Review* (QDR), a document released by the DoD itself, identified climate change as a matter of national security. As a “key geopolitical trend” (DoD 2010, 5-

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<sup>246</sup> Interview with Dr. Marc Kodack, former Water Program Manager in the Office of the Deputy Assistant Secretary of the Army for Energy and Sustainability, Office of the Assistant Secretary of the Army for Installations, Energy and Environment (22/09/2020).

6), climate change impacts on national security are identified in two phenomena. The first is that climate change acts as a threat multiplier – in the words of the *Review*, as an “accelerant of instability” (DoD 2010, 85) - by *contributing*, and not *causing*, to the outbreak of conflict at the international level. Following an argument already widely accepted, this may result in a more demanding HA/DR both in the US and abroad. In this regard, it has been already pointed out how the influence of the 2007 CNA Report has been successful in picturing climate change as threat multiplier. In this sense, it can be underlined another time how much the 2007 Report has directly influenced grand strategy.

The second point that emerges from the QDR is that climate change has impacts on military facilities and capabilities to which the DoD will have to adjust in terms of mitigation and greenization (DoD 2010, 85-86). Related to those issues, the DoD addresses the impacts that climate change has on the Arctic, and assess that

“DoD must work with the Coast Guard and the Department of Homeland Security to address gaps in Arctic communications, domain awareness, search and rescue, and environmental observation and forecasting capabilities to support both current and future planning and operations” (DoD 2010, 86).

The 2010 QDR was not limited to those mentions of climate change, however. The document calls also for special attention to the development of domain awareness tools for the Arctic approaches in addition to the Mexican and Canadian gateways (DoD 2010, 19). The document, however, does not relate homeland defense to the impacts that climate change has on the Arctic (which, on their part, are acknowledged, as it has been mentioned before), at least not explicitly. It is indeed recognized that

“[T]he opening of the Arctic waters in the decades ahead which will permit seasonal commerce and transit presents a unique opportunity to work collaboratively in multilateral forums to promote a balanced approach to improving human and environmental security in the region” (DoD 2010, 86).

But while DoD was keen to engage in climate change identification, this was not true for the Arctic. A more active DoD engagement on impacts of climate change on the Arctic was stimulated by the Congress in the same year, based on the evidence presented by the Department of the Navy (please note the recurring stimulus provided by the work of the Navy). In May 2010, the Committee on Armed Services of the House of Representatives<sup>247</sup> expressed its concern “about the implications and potential consequences of global climate change” (Committee on Armed Services 2010, 337):

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<sup>247</sup> *Per se*, reports by Committees are not legally binding. However, DoD regards them as *de facto* binding, being Committees expression of the Congress.

“[T]he Department of the Navy has indicated that polar ice has decreased by 67 percent since 1979 and that the Arctic Ocean is projected to be ice free for short periods of time starting in the year 2038. The committee is encouraged that the Department of the Navy, working in concert with the respective combatant commanders, has prepared an Arctic Roadmap to address future operations but believes that additional effort needs to be placed on this strategic capability” (2010, 337).

In this framework, the Committee required the DoD to assess the strategic national security objectives and restrictions in the Arctic, required mission capabilities according to a timeline, the need for a unified command under a single combatant commander, required basing infrastructure (including a deep-water port in the Arctic), status and need for icebreakers (2010, 337). In particular, the committee questions the possible benefits of the opening of the Northwest Passage (2010, 337).

A year later, DoD presented its assessment to the Congress (DoD 2011), whose content is summarized in Table 4.3. On this basis, some remarks should be presented. The first is the general conservative stance resulting from the report, which proves careful in calling for more funds for the Arctic. This is evident from the cautious assessment on the need for icebreakers (DoD 2011, 26-28), the initial dual-use of facilities for search and rescue (given the low potential for armed conflict in the region, at least in the foreseeable future, DoD 2011, 25), the conservative approach on the ratification of UNCLOS<sup>248</sup> (DoD 2011, 11), and the number of constraints still influencing DoD activity in the Arctic. Part of this conservative approach is justified by geographic constraints and budget constraints and the *Report* emphasizes the role played by geographic constraints:

*“Arctic operations will continue to be challenging and inherently risky even as the warming climate increases accessibility of the region. The Arctic will continue to experience months of darkness each winter, during which the ice will re-freeze. Even in summer, however, the weather poses dangerous risks. Ships face the possibility of being trapped by wind-blown ice, as well as the threat of superstructure icing, which can impair stability and may lead to capsizing. In addition, sudden storms and fog often limit visibility. The melting permafrost also poses a growing challenge to land operations.”* (DoD 2011, 11-12).

Moreover, it is reported that, according to scientific projections, transpolar routes will not be open until 2040, and only for summer and early fall periods (DoD 2011, 13). The report then

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<sup>248</sup> “Even though the United States is not a Party to the LOS Convention [UNCLOS], the United States will continue to adhere to the core principles of customary international law articulated in the LOS Convention, including the principles of freedom of navigation and overflight” (DoD 2011, 11).

points out how communications above 70° latitudes are limited due to magnetic and solar phenomena degrading high-frequency radio signals, GPS performance is degraded because of poor satellite geometry, ionospheric effects, and multipath interference, especially for weapons targeting and search and rescue, awareness across domains is limited due to distances, limited presence, and harsh environment. Striking is also the pointing out of budget constraints, according to which

“[T]he Arctic is currently seen as a peripheral interest by much of the national security community, a situation not likely to change significantly in the next decade or more, absent some external forcing event, such as a major environmental or human disaster or activity in the Arctic viewed as threatening U.S. interests in the region” (DoD 2011, 12).

**Table 4.3. DoD response to the requests of the Committee on Armed Services (House of Representatives) for NDAA 2011.**

<b>Requests by the Committee (2010)</b>	<b>DoD Report to Congress (2011)</b>
<p>Strategic national security objectives</p> <p>and</p> <p>assumptions and restrictions in the Arctic Region</p>	<ul style="list-style-type: none"> <li>• Desired end-state:               <ul style="list-style-type: none"> <li>- prevent and deter conflict;</li> <li>- prepare to respond to a wide range of challenges and contingencies (cooperatively or unilaterally).</li> </ul> </li> <li>• Changing climate can alter national security interests and objectives over time;</li> <li>• uncertainty of climate predictions;</li> <li>• persisting stable and cooperative relations in the region;</li> <li>• human activity increasing over coming decades;</li> <li>• different agencies involved (DoD and DHS);</li> <li>• application of customary law;</li> <li>• evolving environmental law and regulations;</li> <li>• challenging and risky geography;</li> <li>• budget constraint;</li> <li>• intergovernmental and non-state actors.</li> </ul>
<p>Mission capabilities required</p>	<ul style="list-style-type: none"> <li>• Maritime domain awareness: to be integrated with other operational domains;</li> </ul>

	<ul style="list-style-type: none"> <li>• search and rescue: becoming more challenging;</li> <li>• regional security cooperation: sufficient for the near-term</li> <li>• HA/DR and Defense Support of Civilian Authorities: sufficient for the near-term;</li> <li>• maritime security: a more coordinated approach as human activity increases;</li> <li>• power projection: able to execute;</li> <li>• sea control: lack of surface capabilities able to operate in the marginal ice zone, supplemented partially by air and subsurface capabilities;</li> <li>• strategic deterrence: achieved;</li> <li>• air and missile defense: increasing Arctic access should not affect existing capabilities.</li> </ul>
amended unified command plan	it “would disrupt progress in theater security cooperation achieved over decades of dialogue and confidence-building by USEUCOM and USNORTHCOM with regional interlocutors”
basing infrastructure (and deep-water port)	<ul style="list-style-type: none"> <li>• adapt existing facilities to climate change;</li> <li>• a co-located airport and port facility for undersea search and rescue (dual-use);</li> <li>• no anticipated construction of additional bases or deep draft port in Alaska until 2020.</li> </ul>
icebreakers	additional insights needed

Source: Committee on Armed Services (2010); DoD (2011).

In general, an important point is advanced by the 2011 *Report* despite its conservative approach to the Arctic. The first one (the most important for the purposes of this research) is the mention of the geostrategic role of the Polar ice cap, granting invulnerability to the American continent:

“[T]he harsh Arctic environment and polar icecap have long enhanced U.S. security by acting as a significant physical barrier to access to the U.S. homeland from the north, but the changing climate is allowing greater access to the region” (DoD 2011, 6).



## 5.2 The institutionalization of urgency (2012-2016)

It was not until Obama's second mandate that DoD started its climate change policy and climate change became fully incorporated into strategic planning. Since 2012 a turnout occurred at the highest levels of DoD. Consistent impulse was given by presidential directives during the second mandate, which was more centered on climate change than the first, as also symbolically stated in Obama's second inaugural address (White House 2013). The move towards climate change mitigation and adaptation encompassed several agencies, including DoD. Since the year 2013, actors have been engaged in consolidating their approach to climate change. As it emerged from the previous paragraphs, a major issue realized so far by actors has been that of the uncertainty of the evolving predictions on the Arctic and the following related problem of managing the budget. To make adaptation possible, as already emerged in the *Report to Congress* of 2011, a progressive re-assessment of both Arctic conditions and means has been advocated since the very beginning. This aim has been pursued, demonstrated by a progressive consolidation of the inclusion of climate change in national security planning at all levels, DoD included, with a peak in 2014-2016 in terms of initiatives at all levels.

Obama, as mentioned previously, made climate change one of the key points of his second presidential mandate. Concerning the defense sector, DoD has been included in this policy by Executive Order 13514<sup>249</sup> and Executive Order 13653. This latter, in particular, issued in November 2013, requiring the Federal Government to "pursue new strategies to improve the Nation's preparedness and resilience" (US President 2013, 66819) through continuous development, implementation, and updating of comprehensive plans integrating climate change into agency operations and overall mission objectives.

Following Executive Order 13653, DoD pursued important steps. On the basis of Executive Order 13653, DoD issued the 2014 *Adaptation Roadmap* addressing adaptation to "increase the Department's resilience to the impacts of climate change" (DoD 2014, 1), both at home and internationally. The *Roadmap* identifies the effects of climate change on the department (DoD 2014, 4-8)<sup>250</sup> and consequently integrates them across the four lines of effort through several revisions and new initiatives presented (2014, 9-12). What emerges is an overview of the vast implications that climate change can have on the DoD, summarized into four *lines of effort* (2014, 4): *plans and operations, training and testing, built and natural infrastructure, acquisition, and supply chain*. The lines of effort range thus from the logistical

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<sup>249</sup>Executive Order 131514 required all Federal Departments and Agencies to evaluate climate change risks and vulnerabilities for both the short and long-term, and to include an adaptation planning document as an appendix to its annual Strategic Sustainability Performance Plan (see: <https://www.denix.osd.mil/sustainability/dod-sspp/>)

<sup>250</sup> Four primary climate change phenomena (rising global temperatures, changing precipitation patterns, increasing frequency or intensity of extreme weather events, rising sea levels and associated storm surge) do impact on the DoD *four lines of effort*: plans and operations, training and testing, built and natural infrastructure, acquisition and supply chain (DoD 2014, 4).

dimension to tactics, from strategy at the global level to the vulnerability of homeland facilities ensuring readiness and responsiveness. Finally, in 2016 DoD Directive 4715.21 established policies and assigned responsibilities “to provide the DoD with the resources necessary to assess and manage risks associated with the impacts of climate change” (DoD 2016, 1), starting thus formally DoD climate change policy.

Generally, the second Obama mandate was characterized by a push forward more urgent action to cope with climate change. The fact that the acceleration has been a consequence of presidential initiative is proven by the aforementioned executive orders directed also to DoD. The “accelerating impacts of climate change” are also included in 2015 NSS foreword by President Obama: the *Strategy* states that “[C]limate change is an urgent and growing threat to our national security” (White House 2015, 12), which, however, addresses with emphasis issues related to mitigation, giving preeminence to national actions and in particular to the *Climate Action Plan* by Obama (White House 2015, 12). Concerning the international level, this is reflected also in 2014 the CNA Military Advisory Board intensified its claim for an urgent response to climate change in national security. The report “National Security and the Accelerating Risks of Climate Change,” now centered on the absolute urgency deriving from climate change<sup>251</sup>, stresses the fact that “the projected impacts of climate change will be more than threat multipliers” since they will serve as catalysts for instability and conflict (2014, 2) and that previously outlined risks are comprehensive and accelerating (2014, 8). The report retains features of robust internationalism and stresses the transboundary nature of climate change, requiring a stronger domestic and international response, in particular in the Arctic (2014, 2), for which it is proposed also to unify the Combatant Commands whose AoR (area of responsibility) falls within the Arctic (NORTHCOM and EUCOM) and ratify the UNCLOS. Concerning climate change, 2014 QDR 2014, while restating urgency for action (climate change as threat multiplier and mitigation), assess the release of an updated Arctic Strategy. DoD also releases *Adaptation Roadmaps* (in between identification and management, for our purposes).

### **5.3 Climate change in the Arctic as an issue of homeland defense (2013)**

In the context depicted in the previous paragraph, important steps have been taken concerning adaptation to climate change in the North American Arctic. The first Arctic strategy taking a different form from the security directive was the *National Strategy for the Arctic Region* released on May 10, 2013, by President Obama. The document was released following the model of Arctic strategies adopted by numerous Arctic states in the period 2009-2011, according to a public and accessible format. The 2013 *National Strategy for the Arctic Region* was then followed at the end of the year by the DoD *Arctic Strategy*. The strategy, quite succinct with respect to other states’ strategies (11 pages), addresses the

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<sup>251</sup> In the words of the Military Advisory Board, “[A]t the end of the day, we validate the findings of our first report and find that in many cases the risks we identified are advancing noticeably faster than we anticipated” (CNA 2014, iii).

following “lines of effort”: advancing US security interests, pursuing responsible region stewardship, strengthening of international cooperation (White House 2013, 2). While security is the first topic addressed, considerable space is devoted to regional cooperation, reinforcing the thesis of a *psychomilieu* in which the Arctic is predominantly a cooperative region, and where conflict is at a low level. In this panorama, however, an effective response to both challenges and emerging opportunities “arising from significant increases in Arctic activity due to the diminishment of sea ice and the emergence of a new Arctic environment” (White House 2013, 2) is the very starting point. With an evident emphasis posed to the changing conditions (White House 2013, 5) making the Arctic “a rapidly changing region” (White House 2013, 11) due to “the melting of Arctic ice” (White House 2013, 12). The strategy devotes notable space to the description of the geophysical changes affecting the Arctic. At the presidential level, it is thus an important advance for our purposes. In the strategy, indeed, effects of climate change are identified in plain terms (defined as “changing conditions”):

“(…) the effects are already apparent in the Arctic. Ocean resources are more readily accessible as sea ice diminishes, but thawing ground is threatening communities as well as hindering land-based activities, including access to resources. Diminishing land and sea ice is altering ecosystems and the services they provide” (White House 2013, 4).

More specifically,

“[W]hile the Arctic region has experienced warming and cooling cycles over millennia, the current warming trend is unlike anything previously recorded. The reduction in sea ice has been dramatic, abrupt, and unrelenting. The dense, multi-year ice is giving way to thin layers of seasonal ice, making more of the region navigable year-round. (...) As portions of the Arctic Ocean become more navigable, there is increasing interest in the viability of the Northern Sea Route and other potential routes, including the Northwest Passage, as well as in development of Arctic resources” (White House 2013, 5).

Against this backdrop, the strategy argues that “the opening and rapid development” of the region presents “very real challenges” (White House 2013, 5), even to national security. Consequently, the objectives listed are the *evolving Arctic infrastructure and strategic capabilities in collaboration with the State of Alaska, local, and tribal authorities, enhancing Arctic domain awareness as far safety, security, environment, or commercial interests are affected, preserving freedom of the seas* (including “the enhancement of national defense, law enforcement, navigation safety, marine environment response, and search-and-rescue capabilities”), and *providing for future US energy security* (White House 2013, 7). Climate change, it is argued, poses both challenges and opportunities. On the one hand, opportunities derive from the exposure of natural resources such as oil, gas, rare earth

elements, iron ore, and nickel – all suitable for some original development of infrastructure and commercial initiatives in the region (White House 2013, 5). On the other hand, challenges are identified in the negative impacts on indigenous populations, fish, and wildlife due to the melting of sea ice and the stability of ice sheet, fostering also pollution caused by the thawing of permafrost (White House 2013, 5). The 2013 Arctic strategy, as it can be noted, does not significantly address national security issues. This can be due to the very fact of being a presidential strategy (as such addressed to various agencies<sup>252</sup>) and in the cooperative perspective that is presented for the Arctic region. Nevertheless, it is arguably the first presidential Arctic strategy clearly reporting the effects of climate change – not only: the very rationale of the strategy (detached from the politics of the war on terror) lies in the changing conditions of the Arctic.

Following the presidential *National Strategy for the Arctic Region* (White House 2013), six months later Secretary of Defense Chuck Hagel announced the DoD *Arctic Strategy* on November 22, 2013, at the Halifax International Security Forum. The strategy is the first official Arctic strategy of DoD, meant to implement the objectives stated by the presidential *National Strategy for the Arctic Region* by the DoD. The *Strategy* starts by pointing out how more favorable climate conditions lead to growing human presence in one of the most adverse regions in the world:

“[T]he Arctic is at a strategic inflection points as its ice cap is diminishing more rapidly than projected and human activity, driven by economic opportunity – ranging from oil, gas, and mineral exploration to fishing, shipping, and tourism – is increasing in response to the growing accessibility” (DoD 2013, 2).

The document displays a mix of cooperation and conflict attitude towards regional politics, as already expressed in previous documents. In this regard, the strategy “updates” the desired end-state, by adding the clause of the Arctic as a region where “nations work cooperatively to address challenges” (DoD 2013, 4)<sup>253</sup>. The Arctic remains a region where there is a low level of military threat (DoD 2013, 4). At the same time, the strategy requires to operate both internationally and independently, when necessary, to maintain stability in the region (DoD 2013, 2) for the sake of two supporting objectives (i.e., ensure security, support safety, and promote defense cooperation; prepare for a wide range of challenges

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<sup>252</sup> As it emerges from the appendix on the implementation framework of the strategy (White House 2016), the strategy had to be implemented by several federal departments (plus a number of agencies) ranging from the Department of Commerce, the Department of Transportation, the Department of State, to the Department of Defense, the Department of Homeland Security etc.

<sup>253</sup> The complete desired end-state is the following: “a secure and stable region where U.S. national interests are safeguarded, the U.S. homeland is protected, and nations work cooperatively to address challenges” (DoD 2013, 2).

and contingencies) bounded not only by policy guidance but also by “the changing nature of the strategic and physical environment” (DoD 2013, 5).

In comparison to the documents previously analyzed, the *Arctic Strategy* (as the first official DoD Arctic strategy) is more focalized on traditional “ways”<sup>254</sup> (DoD 2013, 7) and includes issues previously shared only by the Navy. Concerning, in particular, the protection of the homeland and the exercise of sovereignty as part of the strategy’s strategic approach, the document explicitly states that

“greater access afforded by the decreasing seasonal ice increased the Arctic’s viability as an avenue of approach to North America for those with hostile intent toward the U.S. homeland, and the Department will remain prepared to detect, deter, prevent, and defeat threats to the homeland. Additionally, DoD will continue to support the exercise of U.S. sovereignty” (DoD 2013, 8).

The *Arctic Strategy* formally overcomes the conservative approach of 2011 by assigning responsibilities to overcome the uncertainty deriving from climate change impacts of the Arctic. With respect to the 2011 *Report to Congress*, whose purpose was mainly that of assessing gaps and requirements in the Arctic from the perspective of the DoD, *Arctic Strategy* develops a framework articulated in desired end-state, objectives, ways, and related challenges and risks to be implemented on the basis of the *National Strategy for the Arctic Region*. The *Arctic Strategy*, then, overcomes some of the challenges presented by the *Report to Congress*, such as the overlapping authorities between DoD and DHS (2013, 8), the ratification of UNCLOS (2013, 8), the achievement of all domain awareness – which the *Strategy* extends to all domains<sup>255</sup>, enlarging the purpose of the NSPD-66 (2013, 9), and collaboration with scientific and academic communities (2013, 9). As a notable effort in dealing with the uncertain predictions of climate change effects, the *Strategy* purposefully copes with such uncertainty by developing objectives according to the near, mid-, and far-terms evolution. The *Strategy* indeed *de facto* recognizes, in line with the *Report*, that projections are by force inaccurate and that fiscal constraints are inevitable. Nevertheless, it develops a response in terms of the Commander of NORTHCOM (CDRUSNORTHCOM) as the responsible for advocating capabilities, as well as planning and programming activities, together with the Commanders of EUCOM (CDRUSEUCOM) and PACOM (CDRUSPACOM)

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<sup>254</sup> The ways presented by the *Arctic Strategy* are: exercising sovereignty and protecting the homeland, the improvement of domain awareness by engaging public and private sector, preserving freedom of seas, evolving Arctic infrastructure and capabilities consistent with changing conditions, supporting agreements (both existing and pursuing new ones), providing support to civil authorities, support human and environmental safety in partnership with other departments and agencies, supporting international institutions promoting regional cooperation and the rule of law (DoD 2013, 7).

<sup>255</sup> Air, land, maritime, space, and cyberspace.

(DoD 2013, 13). In this way, *implicitly*, the DoD overcomes the uncertainty deriving from climate change (entailing also budgetary choices) thanks to the proximity of the operational level to climate change effects.

Concerning adaptation measures, it will be required for the near-term (to 2020) to develop Arctic operational ability through exercises and training in the region (DoD 2013, 8). From the mid- to far-term (2020-2030), the strategy requires developing further capabilities to protect air, land, and maritime borders in the region (DoD 2013, 8). For this purpose, following the direction of the 2011 *Unified Command Plan*<sup>256</sup> the Commander of the US Northern Command is re-stated as the responsible for advocating for Arctic capabilities, in collaboration with the relevant Combatant Command, the Joint Staff, Military Departments and Services, and other defense agencies, in order to identify and prioritize capability gaps and requirements (DoD 2013, 8). To overcome the duplication of efforts, the strategy requires the DoD to collaborate with the DHS through specific forums (DoD 2013, 8).

#### **5.4 The opening of the Arctic avenue: reinforcing homeland defense (2016)**

It has been already presented how the Navy's engagement in identification had continued until 2014, when the Navy released an update of its *Arctic Roadmap*, assessing future objectives and what has been already achieved since 2009. Climate change is also mentioned about the Arctic in the updated *Cooperative Strategy for 21<sup>st</sup> Century Seapower* (2015, 6). In addressing other services' reactions, the identification process comes to a sticking point. As we have seen before, both the presidential level and DoD have been releasing progressively strategies on the impact of climate change; the Navy, in particular, has been devoting sustained attention to the issue. Absent in this process are the other military departments serving under DoD. No other services in the Joint Force have released their own Arctic strategy or climate change strategies, except for the Marine Corps and the Coast Guard, who have participated in the process along with the Navy. There are, however, some voices pressing for the release of an Air Force Arctic Strategy (Conway III 2017).

In this framework, Arctic strategy has been updated by DoD in 2016 after a bipartisan push<sup>257</sup>, including that of a senator of Alaska. In 2015, the National Defense Authorization Act (NDAA) for Fiscal Year 2016 required an unclassified (with the possible exception of a classified annex) updating of the *Arctic Strategy*, in the form of a report to Congress (Congress 2015, sec. 1068). Generally, the 2016 *Report* restates the key-structure of the *Arctic Strategy*

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<sup>256</sup> *Unified Command Plans* are classified documents by the Joint Chiefs of Staff providing the combatant commanders with operational instructions, updated at least every two years. The 2011 version contained, according to information released by DoD to the public, changes in the AOR boundaries in the Arctic "to leverage long-standing relationships and improve unity of effort" and gave USNORTH the responsibility to advocate for Arctic capabilities (DoD 2011b).

<sup>257</sup> By senators Dan Sullivan (R-AK) and Angus King (I-ME), who sponsored an amendment to the FY2016 NDAA (sullivan.senate.gov 2017).

(desired end-state, objectives, timeframe, the Arctic as a cooperative space). Ways are expanded, however, articulating in more specific terms, in particular, the ways related to traditional national security (“[E]nhance<sup>258</sup> the capability of U.S. forces to defend the homeland and exercise sovereignty; [S]trengthen deterrence at home and abroad; [S]trengthen alliances and partnerships” DoD 2016, 2). Another significant realization is the need for *anticipating a* response to emerging challenges (DoD 2016, 3), as well as a detailed description of the actors involved in the execution of the strategy (*in primis*, combatant commanders and in particular CDRUSNORTHCOM through the recently established Arctic Capability Advocacy Working Group). Persists the emphasis given to the anticipation of challenges through public-private partnerships and interagency collaboration for the achievement of all domain awareness based on research and observation on weather situation, sea ice analysis, and so on (DoD 2016, 11).

The urgency for adaptation (“the Arctic is warming more rapidly than the rest of the planet,” as the *Report* states on the basis of NASA) is expressed through the

“identification and assessment of the effects of climate change on the DoD mission; taking those effects into consideration in developing plans and implementing procedures; and anticipating and managing any risk that develop as a result of climate change to build resilience to the changing operational environment in the Arctic” (DoD 2016, 13).

For our purposes, it is important to note that also the 2016 *Report* states that

“diminishing ice will eventually open a northern maritime avenue of approach to North America, highlighting the importance of the maritime warning mission for NORAD and the Homeland Defense mission for USNORTHCOM, with associated requirements for a seasonal air and/or surface response capability” (DoD 2016, 9-10).

Moreover,

“[T]he breaking up of sea ice also threatens existing detection and warning infrastructure by increasing the rate of coastal erosion. As the maritime approaches become increasingly accessible in the mid- to far-term, DoD will seek to improve its detection and tracking capabilities” (DoD 2016, 10)

a task that will be performed in coordination with other agencies, including DHS (DoD 2016, 10).

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<sup>258</sup> Emphasis added.

The 2016 report leaves several questions open also for the next president. The strategy does not focus on *how* to effectively cope with the intensifying concerns in the region (including militarizing Russia), a point that has been raised also by one of the sponsors of the amendment, Sen. Sullivan, after the release of the report (sullivan.state.gov 2017). This omission is even more puzzling since FY2016 NDAA also raises concern over Russia's presence in the Arctic (sec. 1248.a.4). Last but not least, 2016 strategy, as mentioned before, is not part of an institutionalized framework, as the release of the 2013 version might have implicitly suggested. Hence, the update of the Arctic strategy is still the result of a "contingent" request coming from Alaska.

## 6. Conclusions

As it emerged from the Chapter, the period going from the last years of the Bush administration to the end of Obama's mandate has been crucial in the identification of the link between climate change and homeland defense in the Arctic, and in general in assessing the impacts of climate change on national security. When climate change entered (symbolically) the realm of national security in 2007, climate change has been conceptualized as threat multiplier (CNA 2007), an enduring definition that since that moment has been incorporated into major defense documents (QDR 2010; QDR 2014; White House 2015)<sup>259</sup>. The issue of climate change has been then addressed with more urgency, especially in 2014-2016, when the operational level (TFCC 2014), presidential (White House 2013; Executive Order 13514 and 13653), and DoD (Executive Order 4713.21; 2014) have framed climate change from various perspectives – but all having in common the need for an urgent action despite the inevitable uncertainty deriving from climate models and fund allocation. To cope with such uncertainty, roadmaps and timeframes have been developed by actors (TFCC and DoD in particular).

Since the beginning of the debate, the Arctic has been almost always related to climate change due to its macroscopic impacts, underlining since 2009 how increasing human activity deriving from a more accessible region was posing new challenges for US security. It emerges that at the end of the Obama administration a sort of consensus has been established, stating that climate change was causing a significant change in the Arctic by also paving the path to potential threats to US interests and even homeland defense. This change is not trivial if compared to the disinterest that the national security community expressed before 2007 to climate change and relatively also in 2011.

On the basis of the analysis conducted through formal indicators, three points are especially worthy of attention, and as such, they will be taken into consideration in the following steps of the analysis by integrating such evidence with indicators on actions and enlarging the temporal framework until the end of 2019. The very first point regards *1) the*

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<sup>259</sup> An exception is the report published by the Center for a New American Security in 2010 (Carmen, Parthemore, and Rogers 2010), covering not only the application of the concept of threat multiplier to the empirical world, but also direct effects on the operational level for US armed forces.



*scattered nature of the process*. Indeed, Arctic strategy is the product of the interaction of different actors and sources usually acting beyond a pre-defined institutional scheme. This is particularly evident in taking into consideration the sources taken into consideration by the analysis. An Arctic strategy addressing security issues has been formally outlined only in 2013, and since that moment the strategy has been presented as a report to Congress, as requested by some congressmen (DoD 2016; DoD 2019)

Then, concerning the actors involved, 2) *the Navy's engagement in the process* is noticeable. Not only the Navy has been engaged in more refined initiatives and re-assessment of previous assessments and objectives, but it is also the Navy that, thanks to its presence in the Arctic (especially *under the icecap*), has been able to bridge the transfer of scientific knowledge to the military at the operative level *in primis*, and then to translate such corpus of knowledge and concern to the Congress and the DoD. Together with the Navy also some representatives at the operational level have been particularly active. For example, this merging is evident in the composition of the 2007 Military Advisory Board, which worked on the CNA report of that year.

Finally, 3) *from the US perspective, threats in the Arctic have intensified*. From "inevitable" challenges deriving from search and rescue and HA/DR, emphasizing the rise of potential conflict, domain awareness, and warning has become more intense. This pattern can also be found in advisory reports referring to other climate security-related issues, especially since 2016, confirming thus that it was in that specific context that climate change shifted from being a threat multiplier to a "direct threat to the US homeland," as presented in the report by Peter Engelke and Dan Chiu (2016, 16). In particular, as far as the Arctic is concerned, the 2016 *Report* emphasized the role of the Arctic as a gatekeeper to the continent. Security concerns over the increase of human activity in the region due to more favorable climatic conditions are thus fostering two phenomena: on the one hand, they are weakening military infrastructure in the North American Arctic and fostering more military engagement in the region for the defense of national borders *per se*; on the other hand, less harsh environment and the emerging of appetible resources are progressively becoming more attractive for other countries, increasing international presence in the Arctic and thus creating more competition. On this basis, far from being climate change a challenge at the international level triggering "an unending series of U.S. emergency response operations, gradually degrading the military's ability to fight and defeat America's adversaries" (Klare 2019, 61), the US now perceives climate change effects in the Arctic also as a threat, potentially undermining its territorial integrity and military readiness.

This last point, in particular, is extremely significant but still deserves more investigation. The analysis of documents presents only a face of the adaptation process, making room for other questions: who are the actors threatening US interests or even homeland defense? How much has been made to cope with the challenges emerging from documents? Those will be arguments for the next chapter, in which it will be addressed what concretely has been accomplished in parallel or as a consequence of the identification process.

## CHAPTER V

# Analysis of the Management Process: The Construction of a Credible Deterrent in the North American Arctic

*“And since the armed forces themselves are at risk from the effects of climate change, the situation also requires adapting troops, bases, and military equipment to a hotter planet with more extreme weather conditions.”*

(Klare 2019, 23)

### 1. Introduction

As it emerged from the reconstruction of the identification process, climate change became a full issue of US national security at the end of the Obama administration. A peak has been detected in 2014-2016 when climate change was repeatedly incorporated into major defense documents and more technical documents were elaborated (“Roadmaps”). Those documents were meant to be systematically updated because of the unpredictability of the climate change phenomenon itself. Previous analysis found also that the identification process until the end of the Obama administration has progressively displayed greater emphasis not only on climate change as threat multiplier but also on the impacts that climate change was having on homeland defense, also in the North American Arctic<sup>260</sup>. The process analyzed in the previous Chapter culminated in 2013 and it was even more evident in 2016 when the *Report to Congress on the Arctic* mentioned the possible opening of an avenue of approach to the continent due to the melting ice (DoD 2016, 9-10).

This is what emerged from an analysis based mostly on grand strategy. However, despite grand strategy (and Arctic strategies themselves) is fundamental for setting

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<sup>260</sup> There are two general issues concerning US posture in the Arctic. Firstly, increasing human activity, primarily associated with competition over resources, intensifies existing issues (e.g., land rights claims of indigenous communities, maritime border disputes), and may cause interstate tensions. This fosters diplomatic presence, economic investments and militarization. Secondly, climate change has severe effects on US homeland defense in the Arctic, since it affects US military presence itself regardless of the emerging of “threats”. It is worth reminding that this latter is the case taken into consideration in the analysis.

important guidelines for foreign policy and national security, it avoids by its very nature commitment to specific actions. Thus, it is impossible to judge how much previous analysis has concretely shaped US national strategic posture in the Arctic. As noted by Lindsay Rodman (2019), for example, the Arctic strategy issued in 2016 did not promise either additional resources or prioritization for Arctic issues – not even, in our case, for adapting to the opening of the “avenue of approach” (DoD 2016, 9-10). The same can be said on the other strategies (DoD 2019, for example), even though they provided more clear assessments on regional threats. It follows that to provide a more accurate picture of the causal mechanism, the analysis must be furtherly integrated with an analysis on what actually has been accomplished, drawing on previous analysis.

The question is legit: *how much of what had been identified (concerning the link climate change-homeland defense in the North American Arctic) was implemented?* For example, it has been already mentioned that the Air Force and the Army have been apparently absent in the identification process. However, this does not exclude that they may have been playing some role in the overall adaptation process. More generally, the fact that the link *homeland defense – climate change* (concerning the Arctic) was identified officially by DoD in 2013 and 2016 does not mean that significant initiatives for adaptation had not been already pursued *before*, for example. This chapter will substantially compensate the analysis by taking into consideration mostly (but not only) indicators on actions. It will be crucial to find out *the actors* involved, *when*, and *to what degree* they have engaged in the management of climate change impacts. It is also fundamental to point out *whether those initiatives were related to homeland defense from the actors’ perspective*.

The need for reconstruction and evaluation of how selected actors have managed climate change impacts also comes from the turnout that occurred at the White House after the election as President of Donald Trump (November 2016), who based his presidential campaign on climate change denial. Since the beginning of the new presidency, great concern has been expressed by the scientific community, media, and some exponents of the defense sector on how the issue of climate change would be managed under the new administration: in case of a denialist president, acts demanding federal agencies to enhance climate change resilience were at risk<sup>261</sup>. Part of such concerns was right, indeed. Identification pursued under Trump has been characterized by conflictual trends and ambiguity. Management of climate change as well suffered: for example, in 2018 federal funds were diverted from the recapitalization of the icebreaker fleet to the construction of a wall along the border with Mexico and in 2019 the TFCC was silently disestablished. As it will be seen, during the same period, important steps were taken, following both new defense policies and previous tenets of the security community at large.

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<sup>261</sup> See Executive Order 13653 (White House 2013) and Directive 4715.21 (DoD 2016).

The first section of this Chapter will thus pick up from where it left off, at the end of 2016, with the reconstruction of identification<sup>262</sup> pursued under the Trump administration until March 2020. Being identification by institutional actors pursued in very different terms from what was accomplished under Bush Jr. or Obama, the analysis of actions will be particularly precious, as it will provide more evidence on the overall adaptation process. The second section will then focus on some key-indicators on the management of climate change impacts in the North American Arctic, selected according to the case under investigation (par. 3). In the end, it will be evaluated the degree attained by management in the light of contextual knowledge (par. 4).

## **2. From “climate change” to a “changing physical environment”: identification under Trump presidency**

After the great consideration given to climate change under Obama, a major change occurred with the election of Donald Trump, who made climate change denial one of the key-issues of his presidential campaign. Historically, compliance with international climate agreements has been a hot topic for US politics, but under the Obama presidency, the US has turned to more robust climate compliance, signing the Paris Agreement (2015) and engaging in mitigation and adaptation initiatives also in the defense sector<sup>263</sup>. Indeed, improvements with respect to the “soft” approach of the 1990s (concerning in particular DoD) are valuable proof of the increasing engagement towards mitigation and adaptation in the defense sector. Has the attitude of the newly elected president also affected the actors’ identification process? The following section will address the issue of identification under the Trump presidency, outlining briefly the president’s attitude on climate change itself – which apparently seemed to exclude even the recognition of climate change impacts on national security in general (par. 2.1). Then, it will move to analyze the identification process undertaken by other actors (par. 2.2).

### **2.1 Trump’s position on climate change and national security**

Even at first glance, contradictions and confusion (with a very strong tendency towards denial) on climate change and its effects are recurrent in Trump’s declarations and actions. Since the 2016 presidential campaign, Trump supported the denial of climate change in line with the most traditional position of the republican movement but has also expressed favorable statements (see Bump 2016). On this line, Trump and his entourage's declarations

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<sup>262</sup> Procedures for this part follow what presented in Chapter IV, with the addition of a selection of Tweets, for a more complete perspective, given the extensive use of Twitter by President Trump.

<sup>263</sup> Great attention has been directed towards the *Great Green Fleet*, a plan by Secretary of the Navy Ray Mabus for warships powered by biofuels.

and actions used to underplay the impacts of climate change all over the period taken into consideration by this analysis<sup>264</sup>.

After the release of the *Fourth National Climate Assessment* (2017) which reaffirmed the anthropogenic cause of climate change, Trump in an interview said that he did not believe that unchecked global warming would wreak havoc on the US economy<sup>265</sup>. White House Spokesman Raj Shah furtherly mitigated the *Assessment's* finding, stating that

“climate has changed and is always changing. As the Climate Science Special Report states, the magnitude of future climate change depends significantly on ‘remaining uncertainty in the sensitivity of Earth’s climate to [greenhouse gas] emissions’<sup>266</sup> .

After the release of the IPCC *Special Report* (2018), in an interview to CBS<sup>267</sup> Trump stated that climate change scientists had a political agenda, casting doubt also on the anthropogenic cause of climate change. But during the same interview, Trump also backed off from its previous statement (on Twitter) that climate change was a hoax<sup>268</sup>. Then, after the outbreak of severe wildfires in California in summer 2018, Trump tweeted on November 10, 2018, that

“[T]here is no reason for these massive, deadly and costly forest fires in California except that forest management is so poor. Billions of dollars are given each year, with so many lives lost, all because of gross mismanagement of the forests. Remedy now, or no more Fed payments!”.

Moreover, some statements clearly display misconceptions about the very phenomena of global warming and climate change. In January 2018, in an interview at the World Economic Forum in Davos, the President displayed misinformation on the very

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<sup>264</sup> See for example one of Trump’s reactions on 2020 wildfires across the West Coast during an official briefing with California officials, as reported for example by CNN (Vazquez 2020).

<sup>265</sup> *BBC*, 26 November 2018: <https://www.bbc.com/news/world-us-canada-46351940>

<sup>266</sup> Quoted in Mooney, Eilperin and Dennis (2017).

<sup>267</sup> *CBS News*, 15 October 2018: <https://www.cbsnews.com/news/trump-says-climate-change-not-a-hoax-but-questions-if-its-manmade/>.

<sup>268</sup> A tweet from November 6, 2012 (@realDonaldTrump) claimed that “the concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive”.

concepts of climate change and global warming<sup>269</sup>. On the same line, in January 2019, referring to the winter storm that hit the US Pacific Northwest, Trump invoked global warming to mitigate the storm deadly effects<sup>270</sup>.

Trump presidency has also been characterized by the appointments of strong denialists in key environmental offices. Trump personally appointed both Myron Ebbell to the Environmental Protection Agency in November 2016 and physicist William Happer at the National Security Council in November 2018 as an advisor<sup>271</sup>. Moreover, a number of fossil fuel advocates hold key-offices throughout the presidency, also in offices for environmental protection<sup>272</sup>. Trump also stated his intention of withdrawing from the Paris Agreement and replace the *Clean Power Act*.

In addition to this, by revoking Executive Order 13653 (signed by Obama in 2013), Trump called off one of the milestones of environmental policy, deeply affecting all federal agencies including DoD. In March 2017 a new executive order required executive departments and agencies to

“immediately review existing regulations that potentially burden the development or use of domestically produced energy resources and appropriately suspend, revise, or rescind those that unduly burden the development of domestic energy resources beyond the degree necessary to protect the public interest or otherwise comply with the law.” (White House 2017)

Against this backdrop, many were surprised by the fact that the President had not opposed 2018 NDAA (which stated that “climate change is a direct threat to the national

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<sup>269</sup> “There is a cooling, and there's a heating. I mean, look, it used to not be climate change, it used to be global warming. That wasn't working too well because it was getting too cold all over the place” (in Colman 2018).

<sup>270</sup> January 20, 2019 (@realDonaldTrump): “(...) Large parts of the Country are suffering from tremendous amounts of snow and near record setting cold. Amazing how big this system is. Wouldn't be bad to have a little of that good old fashioned Global Warming right now!”. Some months before, November 22, 2018, Trump questioned in a Tweet how could cold records be compatible with global warming (@realDonaldTrump).

<sup>271</sup> Happer left the office in September 2019. He has probably been the only scientist to have briefed the President on climate change (Waldman, 2019).

<sup>272</sup> Rex Tillerson as Secretary of State (February 2017 – March 2018), Rick Perry as Secretary of Energy (March 2017-December 2019), Scott Pruitt as Administrator of the Environmental Protection Agency (February 2017 - July 2018) and his successor, Andrew Wheeler (July 2018 – present). In addition, the Environmental Protection Agency under Trump removed all mentions to climate change.

security of the United States<sup>273</sup>) and signed the act into law. This last point, however, should not entail that the president's attitude on climate change has been different while addressing national security. On the contrary, defense documents released by the White House have been often criticized by military and analysts because of the inexistent or scarce attention devoted to climate change effects at all levels. In particular, it raised concern over public opinion and media the fact that 2017 *National Security Strategy* did not list climate change among the priorities of the US strategic environment. The *Strategy* contains just one indirect mention, stating that the US is "a global leader in reducing traditional pollution, as well as greenhouse gases while expanding (...) economy" (White House 2017, 22). The Arctic is mentioned just once in reference to general interaction within international institutions along with the outer space, the digital realm, and interactions "across land and sea" (White House 2017, 40).

While investigating the reasons for such positions is beyond the purposes of this research, the very starting point of the analysis is the "atypical" and confused attitude of the newly elected president which permeates the whole course of his mandate. In this panorama, with respect to national security, the removal from the *National Security Strategy* of all mentions to climate change as a threat to national security is a significant point.

## **2.2 Identification by other actors after 2016**

Across the selected actors, the President's position remained a deviant case. The following paragraph moves to consider how other actors have identified climate change impacts on national security since 2016 and specifically its impacts on the Arctic. For this purpose, at first will be presented the input given by Congress through the enactment of 2018 NDAA, and statements given by high-level officers (par. 2.2.1). On this basis, institutional identification (par. 2.2.2) and non-institutional identification (par. 2.2.3) will be compared, finding out considerable consistency among actors on the existence and the urgency of climate change impacts on national security.

### **2.2.1 NDAA 2018: climate change as a direct threat to national security (2017)**

In the temporal framework here taken into consideration, the US security community at large has shown a mixed attitude on the relevance (and the existence) of climate change. On the one hand, direct mentions of climate change and global warming have been removed from grand strategy documents. On the other, some documents released by institutional actors (e.g., DoD, Navy) have actually addressed climate change impacts, usually avoiding the words *climate change* or *global warming*. Those documents have not been characterized by the same in-depth analysis of climate change impacts as other initiatives undertaken during the Obama administration. At a macroscopic level, this duality is evident in observing two

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<sup>273</sup> NDAA 2018, sec. 335.b.1.

pieces of evidence released both at the end of 2017: the 2018 NDAA and 2017 NSS. At odds with the NSS, stands indeed 2018 NDAA (signed into law on December 12, 2017), which formally defined climate change as a direct threat to national security in federal law. Even though the act has not been directly produced by the actors selected for the analysis, it is extremely relevant for the context in which actors have been acting, because of the content of the act and the ties held between political representatives and some of the actors selected for the analysis (e.g., retired officials, think-thanks and some institutional actors).

Behind the law stands Rep. Jim Langevin (a member of the House Armed Services Committee, already one of the authors of a letter to President Trump requiring the inclusion of climate change as part of the NSS), who sponsored an amendment for the inclusion of climate change in the act (the Langevin Amendment). The amendment eventually passed in the House and the Senate<sup>274</sup>. During the legislative process, a further amendment<sup>275</sup> was proposed at the House of Representatives by Rep. Scott Perry to eliminate any language of *climate change*, but the amendment was rejected (185-234 votes). As noted by some analysts, “(...) dozens of Republicans crossed the aisle to reject the Perry Amendment and preserve the climate change requirement” (The Climate and Security Advisory Group 2018, 2).

NDAA 2018 states that climate change 1) is a direct threat to US national security and also acts as a threat multiplier (climate change “is impacting stability in areas of the world both where the United States Armed Forces are operating today, and where strategic implications for future conflict exist”<sup>276</sup>), and that 2) despite the complexities in quantifying the costs on mission resiliency, DoD “must ensure that it is prepared to conduct operations both today and in the future and that it is prepared to address the effects of a changing climate on threat assessments, resources, and readiness,” and 3) that military installations must be able to effectively prepare to mitigate climate damage<sup>277</sup>. Climate change effects on the Arctic are also identified<sup>278</sup>. The law then requires the submission of a report to the Committees on Armed Services of the Senate and the House on vulnerabilities to military installations and combatant commander requirements deriving from climate change (20 years), in line with previous legislation under Obama. The report was issued in January 2019 (DoD 2019a).

Experts have welcomed the fact as a watershed event (Holland 2017; Conger, in Tritten 2017; Werrell and Femia 2017). In particular, the very fact of putting language of

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<sup>274</sup> Senator Bill Nelson offered an amendment calling for a comprehensive threat assessment and master plan for climate change by DoD. The amendment was approved.

<sup>275</sup> Available at : <https://www.congress.gov/amendment/115th-congress/house-amendment/179/text?r=7&s=1>

<sup>276</sup> 2018 NDAA, sec. 335.b.1.

<sup>277</sup> 2018 NDAA, sec. 335.b.3.

<sup>278</sup> 2018 NDAA, sec. 1054.



*climate change* in the bill is, according to former government official John Conger (in Tritten 2017), a remarkable proof of the accepted relevance of the issue. NDAA 2018 represents the culmination of the path undertaken by Congress *and* the military: the rationale for considering climate change as a direct threat to national security is based, as reported by the act (statements were derived from the Langevin Amendment and the Nelson Amendment) on the impressive words by various high-ranking militaries and defense officials<sup>279</sup>.

### 2.2.2 Institutional identification

In contrast to the presidential level, DoD has been pursuing a more linear path despite the constraints deriving (allegedly) from the President's political orientation. While at the end of 2017 Congress declared officially climate change as a direct threat to national security. In the unclassified summary of the *National Defense Strategy* (NDS) released in January 2018 (only 11 pages) by DoD, climate change was not mentioned at all. The fact has raised many comments: the omission was a “critical error” according to BGen Stephen Cheney (2019), while John Conger (2018) said that climate change is implicitly included in the document. The NDS does not directly mention climate change impacts in relation to the strategic environment, despite such “general” passages were part of the very first documents dealing with climate change in the 1990s. In stating that “the homeland is no longer a sanctuary”, the NDS indeed claims that

“America is a target, whether from terrorists seeking to attack our citizens; malicious cyber activity against personal, commercial, or government infrastructure; or political and information subversion. New threats to commercial and military uses of space are emerging, while increasing digital connectivity of all aspects of life, business, government, and military creates significant vulnerabilities. During conflict, attacks against our critical defense, government, and economic infrastructure must be anticipated” (DoD 2018, 3).

The background of the new DoD Arctic strategy (June 2019) was the substitute of the Navy’s Roadmaps, the Navy’s *Strategic Outlook* (2019), and the Coast Guard *Strategy*. In the *Outlook* the starting point is that the Arctic environment is changing, causing an intensification of human activity in the region by Arctic and non-Arctic states, in terms of maritime disputes, increasing maritime traffic, and resource accessibility (CNO 2019, 5). Despite the current low level of conflict, the document envisages “risks in our return to an era of Great Power competition” (CNO 2019, 5), but “[I]t remains unlikely that any of the

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<sup>279</sup> Secretary of Defense James Mattis, Joint Chiefs of Staff Joseph Dunford, former Secretary of Defense Robert Gates, former Chief of Staff of the Army Gordon Sullivan.

eight Arctic states would risk a large-scale conflict; however, the Navy will be prepared to deter conflict and protect our national interests” (CNO 2019, 5).

Strategic competition is thus the focus of the *Outlook*. While the document does not dramatically emphasize the threat of a direct assault on American territory, its emphasis on the regional level tensions put by Russia and China is evident. In plain terms, the document states that “the Joint Force must be able to deter, and if necessary, defeat great power aggression” (CNO 2019, 2). In this perspective, and according to presidential politics, the Arctic assumes the role of a minor, but significant, theatre of a global chessboard, in which “[D]eveloping a more lethal, resilient, agile, and ready Joint Force will ensure that our military sustains its competitive advantages, not only for these key regions of strategic competition [Indo-Pacific and Europe], but globally as well” (CNO 2019, 2).

The *Outlook* seems extremely limited with respect to previous Navy documents that constituted the very backbone of climate change adaptation concerning national security. In an interview, Admiral Titley, the “father” of the TFCC, admitted that he had been “massively underwhelmed” by the new strategy and that “the U.S. Navy is really not interested at this point in time of committing surface forces or even putting money into developing ice-capable surface forces that in the future could have a robust presence in the Arctic” (in Schreiber 2019). Moreover, the strategy does not address either the role played by submarines or the reorganization resulting from the reactivation of the Second Fleet<sup>280</sup>, a point that furtherly stresses the limited awareness of the new Navy’s formal guidance.

The new DoD *Arctic Strategy* was released in June in the form of a report to Congress, responding to 2018 NDAA. The document displays a general concern over the strategic competition in the Arctic and – significantly for our purposes and the consequences that such competition can have on homeland defense. As first, the 2019 *Strategy* updates the desired end-state for the Arctic, defining the Arctic as “a secure and stable region in which U.S. national security interests are safeguarded, the U.S. homeland is defended, and nations work cooperatively to address *shared*<sup>281</sup> challenges” (DoD 2019, 2). Much focus of the document is devolved to the achievement of “competitive military advantages” in a variety of theatres (Indo-Pacific, Europe) to protect national interests *in the Arctic*. Military advantage is thus considered functional to the maintenance of “a credible deterrent for the Arctic region” (DoD 2019, 1). In great contrast with previous strategies, 2019 *Arctic Strategy* presents a security environment which “is increasingly uncertain, with a deepening and intensifying of certain problematic strategic trends” (DoD 2019, 3). As clearly stated, the main global (and Arctic) competitors acting in an “era of strategic competition” (DoD 2019, 2) are Russia and China. Such an approach follows strategic guidance provided by NSS (White House 2017) and the NDS (DoD 02018). In this perspective, strategic competition permeating global international relations is displayed also in the Arctic region.

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<sup>280</sup> On the reactivation of the Second Fleet, please see par. 3.2.3.

<sup>281</sup> Emphasis added. The addition of the word “shared” indeed underlines the conflictual perspective of the *Strategy* on international relations in the Arctic.

The dynamics negatively affecting the Arctic security environment reported in the *Strategy* are several. One reason is access to sea routes and maritime disputes: it is claimed in the strategy that “Russia and Canada claim the right to regulate Arctic waters in excess of authority permitted under international law” respectively in the Northern Sea Route and the Northwest Passage, which the strategy remarks as “subject to the complete sovereignty of Canada” (DoD 2019, 4). Then, conflictual relations are envisaged in the increasing military activity of Russia, concerning territorial defense on the coastline (in particular, the establishment of the Northern Fleet Joint Strategic Command) and China, whose regional presence is still limited but characterized by an intensifying trend that can be “potentially including deployment of submarines to the region” (DoD 2019, 4). The involvement of competitors in the Arctic is not limited to the military level. Conflict takes place also at the economic level, as proven by China’s *Polar Silk Road* initiative announced in January 2018 or by the establishment of research stations in partner states. In this light, “despite China’s claim of being a “Near Arctic State,” the United States does not recognize any such status” (DoD 2019, 5).

It is worth noting again that the document does not mention the word “climate change.” The same *modus operandi* of the 2019 Arctic Strategy has been adopted, for instance by Secretary of State Michael Pompeo on the occasion of the Arctic Council Ministerial meeting at Rovaniemi in 2019, in mentioning “[S]teady reductions in sea ice” without the words “climate change” or “global warming” (Pompeo 2019). According to an expert, “[G]iven that one of the highest-ranking members of the US government refused to acknowledge climate change in a speech about the Arctic to the Arctic Council, don’t expect it to appear in any official military strategy document” (Madeira 2019). However, the analysis of its *effects* is clearly expressed throughout the strategy. For example, it is stated that

“[T]he Arctic’s physical environment continues to change, including through diminished sea ice coverage, declining snow cover, and melting ice sheets. Temperatures across the Arctic region are increasing more than twice as fast as global average temperatures, accompanied by thawing permafrost and loss of sea ice and glacier mass” (DoD 2019, 3).

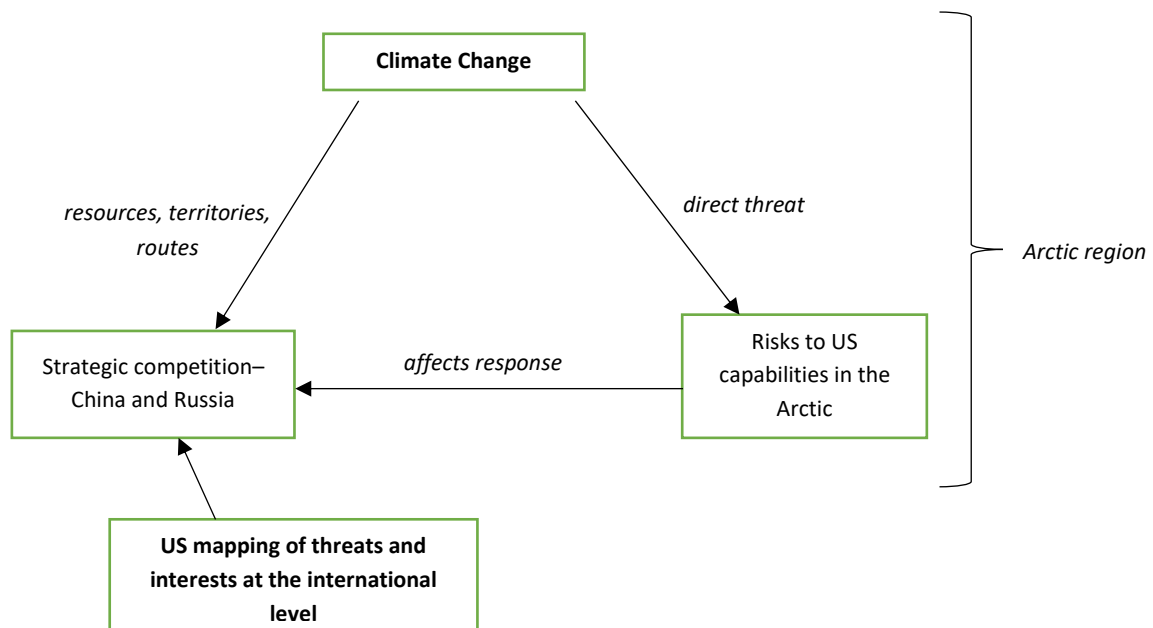
In this contexts, the origins of a *potential conflict* outbreaking in the Arctic (“a great power aggression” as in DoD 2019, 2) lie also in the Arctic Rush originating from global warming: the opening of new shipping lanes and increasing access to natural resources during summer are indeed some of the challenges posed to the US in the Arctic. The effects of thawing permafrost, with storm surge and coastal erosion affecting also DoD infrastructure, the strategy states, will be more and more challenging since “[I]f the warming trend continue at the current rate, Arctic-wide sea ice loss may result in nearly ice-free late summers by the 2040s.” (DoD 2019, 3).

For the purposes of the research, this last point is of particular importance. As reported by the *Strategy*, reasons for conflict are to be found not only in goals and priorities at the global level (as expressed by Trump’s grand strategy) but also in the “changing physical environment” as mentioned in the DoD *Strategy* (DoD 2019, 3). Such a changing physical

environment is nothing but climate change<sup>282</sup>. Not only climate change fosters the scramble for the Arctic in terms of states' claim for natural resources and sea routes (inviting also non-Arctic states, such as China), aggravating strategic competition derived from the international level, but it also has vital impacts on the homeland itself. Those interrelations (summarized in Figure 5.1) are constituted by two factors (namely, climate change plus grand strategy), according to the *Strategy*:

“[T]he Arctic is strategic terrain as a potential vector for an attack on the U.S. homeland. China and Russia pose discrete and different challenges in their respective theaters, but both are also pursuing activities and capabilities in the Arctic that may present risks to the homeland. In addition to the challenge posed by strategic competitors, coastal erosion and permafrost thaw pose risks to DoD Arctic installations. Increased economic activity in the Arctic raises the probability of a mass casualty incident in the Arctic where DoD assistance may be requested. (...) These events may also inhibit DoD's ability to project power from the homeland” (DoD 2019, 6).

**Figure 5.1 The Arctic security environment as in 2019 DoD Arctic Strategy.**



Source: own elaboration based on DoD (2019).

<sup>282</sup> Changing physical environment indeed is due to diminishing sea ice coverage, declining snow cover, melting ice, temperatures raising, thawing permafrost, loss of sea ice and glacier mass, storm surge, coastal erosion (DoD 2019, 3).

In this uncertain and complex scenario, adaptation is necessary to ensure homeland defense (the protection of national borders), regardless of the likelihood of full-fledged conflict. The very first objective is indeed that of protecting US national security interests, including the Arctic as part of the homeland (DoD 2019, 6). Moreover, it is re-stated the concept already expressed in 2016 *Report* concerning the Arctic as a potential avenue of approach:

“[T]he Arctic is also strategic terrain because it constitutes the north approached to the United States; DoD must defend the homeland against threats emanating from these approaches” (DoD 2019, 6).

### 2.2.3 Non-institutional identification

As it was seen in the previous paragraph, 2018 NDAA, which declared climate change a direct threat to national security, has not been followed by any remarkable step towards a complete inclusion of climate change in strategic planning at the highest levels of strategy. After the president had signed the law, however, non-institutional actors have been active in fostering attention on climate change as a threat, especially after the evident absence of mentions of climate change or global warming in official documents. In the last years, concerns have been expressed by former officers, government officials, and think-thanks, on several grounds.

In 2018, a group of bipartisan senators questioned the omission of

“survey results that senior DoD officials asked military installations to report regarding their vulnerability to an increase in mean sea level. It also removed findings about how climate change is affecting the operating environment in the Arctic and the potential risks to DoD’s ability to conduct training and testing activities that are essential to military readiness”.

The letter continues, claiming that “[T]hese are substantive, not stylistic, changes — and it is not the way we expect DoD to conduct business.”

The removal of climate change as a threat to national security from grand strategy documents, in particular, has raised concern since the beginning of the presidency. After the release of the NSS in December 2017, a letter<sup>283</sup> signed by a bipartisan group of 106 lawmakers led by Elise Stefanik (Republican) and Jim Langevin (Democrat) asked Trump to reconsider such a position based on what expressed by scientists, military leaders, and civilian personnel fully viewing climate change as “a geopolitical threat,” and as “a direct

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<sup>283</sup> The letter can be found at:

[https://langevin.house.gov/sites/langevin.house.gov/files/documents/01-11-18\\_Langevin\\_Stefanik\\_Letter\\_to\\_POTUS\\_Climate\\_Change\\_National\\_Security\\_Strategy.pdf](https://langevin.house.gov/sites/langevin.house.gov/files/documents/01-11-18_Langevin_Stefanik_Letter_to_POTUS_Climate_Change_National_Security_Strategy.pdf)

threat to America’s national security and to the stability of the world at large” especially since both military and civilian installations were becoming increasingly exposed to devastation by sea-level rise and landscape change. Significantly, the letter then mentions the position of Secretary of Defense James Mattis and 2017 NDAA as an important landmark. Similarly, a group of senior military officers and national security officials in May 2017 directly addressed Mattis, claiming that

“[A]s you understand from your pragmatic assessment of the national security risks of a changing climate, our nation’s military does not have the luxury of waiting for perfect certainty before acting. As retired military and national security leaders, some of whom have served with you, we also know that addressing “blind spots” in the global operating environment is critical for ensuring national security.

Since climate change is altering that operating environment – directly impacting our critical infrastructure and increasing the likelihood of humanitarian disasters, state failure, and conflict - we have a responsibility to remove that blind spot. For the armed forces, this means, at the very least, adapting to these climatic changes in order to enhance our force readiness, maintain operational effectiveness, and fulfill our strategic goals”.<sup>284</sup>

In March 2019, following the downplaying by Trump of the findings of the *National Assessment* and the appointment of physicist denialist William Happer, fifty-eight senior military officers and national security leaders addressed Trump, expressing their support for science agencies and denouncing national security conforming to policy<sup>285</sup>. The same year, sixty-four senior military, national security, and intelligence leaders coordinated by the Climate and Security Advisory Group, released a roadmap explicitly addressed to the President. The report urges the President to address the security risks posed by climate as a national priority and to integrate climate change impacts “into the considerations of security actors throughout the government,” “as a risk that informs and affects the security priorities with which these agencies wrestle on a daily basis” (The Climate and Security Advisory Group 2019, 8). The report then develops four detailed “pillars of actions” (*demonstrating leadership, assessing climate risks, supporting allies and partners, preparing for and preventing climate risks*); on this basis, specific recommendations to

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<sup>284</sup> The letter can be found at: [https://climateandsecurity.org/wp-content/uploads/2014/01/letter-to-secretary-mattis\\_center-for-climate-and-security\\_2017\\_05\\_08.pdf](https://climateandsecurity.org/wp-content/uploads/2014/01/letter-to-secretary-mattis_center-for-climate-and-security_2017_05_08.pdf)

<sup>285</sup> The letter can be found at: [https://climateandsecurity.org/wp-content/uploads/2019/03/letter-to-the-president\\_senior-military-and-national-security-leaders-denounce-nsc-climate-panel\\_2019\\_3\\_05-1.pdf](https://climateandsecurity.org/wp-content/uploads/2019/03/letter-to-the-president_senior-military-and-national-security-leaders-denounce-nsc-climate-panel_2019_3_05-1.pdf)

federal agencies are outlined, proposing detailed institutional reforms from the White House to DoD, DHS, and the intelligence community, to cite only a few.

Worth of mention at this point is the position of Secretary of Defense Jim Mattis, more than once mentioned in the appeals coming from non-institutional actors. Even before he was appointed Secretary of Defense, Mattis expressed concern over climate change impacts on national security at the operational level as commander of the US Joint Forces Command (US Joint Forces Command 2007; 2010). Some of his statements on the effects of climate change as Trump's Secretary of Defense were included in 2018 NDAA<sup>286</sup>. The former Secretary of Defense (Mattis announced his resignation in December 2018) has also raised awareness before Congress (2017)<sup>287</sup> and in public interviews (2019)<sup>288</sup>. For his silent but enduring compliance to the seriousness of climate change, the former general of the Marine Corps has been pledged since the beginning as "Trump's Cabinet lone green hope" (Wolff 2016) and later as "the lone climate change soldier" in the administration (Udvardy 2017), receiving the compliments also from independent analysts (Femia and Werrell 2018). About his silence, broken once he resigned, it has recently emerged that Mattis admitted that he was avoiding open conversations about climate change because of his position as Secretary of Defense (in Oprihory and Cohen 2019).

### 3. Management of climate change impacts

Even though there has been no explicit identification of climate change consequences in major strategic documents under Trump, in the light of the new outlook, challenges to homeland defense in the North American Arctic are even more evident and pressing than before, given the twofold but interrelated factors influencing the scenario (see Figure 5.1). Given this unbalanced scenario, it is useful to enrich the analysis by addressing what has been accomplished in terms of adaptation for homeland defense in the North

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<sup>286</sup> Sec. 335.a.2: "Secretary of Defense James Mattis has stated: 'I agree that the effects of a changing climate - such as increased maritime access to the Arctic, rising sea levels, desertification, among others - impact our security situation'".

<sup>287</sup> On Mattis' unpublished testimony held to the Senate Armed Services Committee in March 2017, mentioning also impacts on the Arctic, see Revkin 2017. In that occasion, Mattis stated for example that "[C]limate change is impacting stability in areas of the world where our troops are operating today. It is appropriate for the Combatant Commands to incorporate drivers of instability that impact the security environment in their areas into their planning".

<sup>288</sup> Interview released to MSNBC on September, 5 2019 (<https://www.msnbc.com/andrea-mitchell-reports/watch/watch-general-jim-mattis-talks-climate-change-with-andrea-mitchell-68275269654>) and the speech given at a book event held in Washington, D.C. (Oprihory and Cohen 2017).

American Arctic and to test to what degree adaptation has been pursued despite such an “ambiguous” identification.

As Arctic state, the US bears fundamental interests in defending the North American Arctic, for three purposes that have been pointed out in the previous Chapter - all of them to some degree deriving from increasing climate change effects: ensuring stability in the region, defending the global commons, and defending the homeland. As pointed out in 2012 in the *Joint Force Quarterly*,

“the Arctic Ocean north of Alaska has been easily protected and of limited strategic importance due to the ice that has shielded it, impeding both access and use. Now the ice is melting, creating new opportunities and potential threats to U.S. national interests. This shift in the geopolitical environment requires prompt re-examination of U.S. military capabilities, roles responsibilities, organizations, and command structure in Alaska” (Ohotnicky, Hisey, Todd 2012, 56).

To prepare a response to a wide range of challenges and contingencies in the Arctic, the US must thus display some crucial assets and operate them either independently or in conjunction with other states (DoD 2011, 9). Those assets should be effective for the deterrence of a possible conflict, the defense of US borders, and the response to a vast number of challenges deriving from the mere fact that human activity in the region is intensifying (such as search-and-rescue, HA/DR, or support of civil authorities).

To begin with, it will be outlined first how the analysis of management has been conducted (par. 3.1). Then, management will be reconstructed and evaluated with respect to the selected issues (par. 3.2).

### **3.1 Remarks on the research design for the management process**

The qualitative indicators analyzed in this part of the chapter<sup>289</sup> (presented in Table 5.1) are a necessary simplification of the very complex Arctic security environment. They have been selected on the basis of an exploratory analysis on the ongoing debate in the US among non-institutional actors (e.g., think-tanks, seminars, newspapers), confronted then with evidence coming from institutional actors (e.g., NDAA, symposia, Arctic strategies), and by taking into consideration the specific aims of the research (homeland defense in the North American Arctic according to the selected actors). At first, indicators (e.g., maritime presence in the Arctic, military-led exercises) that can account for an effective outcome (adaptation) have been selected by taking into account the specificities of the mechanism. Then, to assess how much of those issues has been accomplished, more specific indicators have been selected (e.g., gear, field training, link to climate change). The overall picture will be then evaluated at the end (par. 4).

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<sup>289</sup> To which par. 3.2. is dedicated.



To validate the mechanistic evidence of actions pursued (or not pursued) for the achievement of the issues presented in Table 5.1 has been followed the same approach adopted for the identification process, namely a qualitative evaluation of the degree of the entity’s engagement with respect to the context. Sources (mostly interviews, newspapers, reports, secondary literature) are not formally divided according to actors they are retrieved from, given the nature of the processes here analyzed.

**Table 5.1. Qualitative indicators selected for the analysis.**

<b>Qualitative indicators</b>	<b>Assessed through:</b>
Tactical readiness in extreme cold weather	Notable initiatives concerning effective gear
	Notable initiatives concerning field training
Military-led exercises in the Arctic	Link to climate change
	Link to homeland defense
Maritime presence in the Arctic	Recapitalization of the icebreaker fleet
	Reinforcement of the Navy’s presence
	Construction of a deep-water strategic port
Response to thawing permafrost effects on military installations	Sequencing of measures
Command responsibility for the Arctic	Measures aiming at the realignment of operational command

Source: own elaboration.

### **3.2 Reconstructing the management process**

In the analysis that will be developed in the following paragraphs, it will be outlined which important steps in the management of climate change impacts have been taken. For the sake of readability, this section will be limited to the search for evidence relevant for the analysis and to the presentation of the key steps undertaken, mostly in chronological order. The analysis will thus take into consideration the following indicators useful for a general assessment on the progress of the management process of climate change impacts in the North American Arctic: tactical readiness in extreme cold weather (par. 3.2.1), military-led exercises in the Arctic (par. 3.2.2), maritime presence in the Arctic (par. 3.2.3), response to thawing permafrost effects on military installations (par. 3.2.4), command responsibility for the Arctic (par. 3.2.5).

#### **3.2.1 Tactical readiness in extreme cold weather**

In harsh environmental conditions, cold weather and mountain training are essential to ensure tactical readiness and survive. Extreme cold weather training (namely that under

60 F), in particular, is a demanding challenge for the military operating at the tactical level on the ground. As underlined by the Army,

“[I]n the Arctic, a single mistake or mishap may be only minutes from disaster. A lost glove system, an ignored cold foot, heavy sweating from overexertion without clothing management, or a skidoo accident can result in rapidly progressing injury without hope for a quick evacuation to warmer surroundings or even cover from wind in a tree line.” (Roussell 2019).

In extreme cold weather conditions, the military cannot rely on vehicles or anything that is powered by batteries (including GPS devices). With 50 or 60 F below zero, military vehicles become vulnerable, so that according to a training specialist at the Northern Warfare Training Center, even those designed for the cold quit working and engine oil and transmission fluid freeze (quoted in Vergun 2017). Arctic conditions are very different from the “usual” conditions to which US armed forces used to operate and require thus considerable adaptation. This paragraph will look for evidence on significant actions towards the achievement of readiness under 60 F, through 1) gear, 2) tactical training.

Indeed, in the last years (since 2015, but even more evidently since 2017), the Army and the Marine Corps, in particular, have displayed growing attention towards adapting tactical skills and gear to extreme cold. On the homeland, the major landmarks for training soldiers to Arctic or quasi-Arctic conditions have been the Northern Warfare Training Center (Fort Wainwright, Alaska), providing cold weather and mountain training<sup>290</sup>, and Eielson Air Force Base (Alaska), which hosts the Arctic Survival Training School<sup>291</sup>. Recently, the Army has increased unit training in the Arctic, including airborne operations (2014), armored vehicle deployment exercises (2015), and made the 75<sup>th</sup> Ranger Regiment<sup>292</sup> train in Alaska for the first time since 2001 (South 2018).

A critical thrust forward occurred in 2015. In that year, Fort Drum (along with Fort Lee and Fort Bragg) has been reclassified from Zone 5 to Zone 7 (Arctic)<sup>293</sup>, fitting the same zone as Fort Wainwright, Alaska, and Camp Ethan Allen, Vermont. The change entails that a fund of \$12.5 million was allocated to Fort Drum to improve its cold-weather sustainability (Simon 2017). Part of this fund has been spent on a new clothing system (Simon 2017). At the moment (2020), the clothing system adopted by the Army (*Extended Cold Weather Clothing System*, ECWCS) is of Generation III since 2016: ECWCS III is officially designed for being effective at -60 F, but as many noted, it effectively performs “only” at -40 or -45 F (Cox

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<sup>290</sup> *Cold Weather Leaders Course; Cold Weather Orientation Course.*

<sup>291</sup> The Arctic Survival Training School is the Air Force oldest survival school.

<sup>292</sup> A special operation force.

<sup>293</sup> Zone 5: the warmest month being above 68 degrees Fahrenheit and the coldest month being below 32 degrees.

2019). For this reason, at the beginning of 2020, a select number of 10<sup>th</sup> Mountain Division soldiers received new, prototype cold-weather gear at Fort Drum: the *Cold Temperature and Arctic Protection System* (CTAPS) designed explicitly for -45 to 65 F (Rakowsky 2020).

Training goes also through international partnerships. To learn survival skills<sup>294</sup>, trainers from US military centers are known for their collaboration with other states, such as Nepal (Vergun 2017), Sweden<sup>295</sup>, and Norway (Rempfer 2019). Extreme cold weather training has been performed also by the rotational presence of two Marine Corps companies (currently around 700 men composing the Marine Rotational Force) in Norway since 2017, strongly supported by Commandant of the Marine Corps, Gen. Robert Neller. In Norway, the Rotational Force is technically stationed below the Arctic (near Tromsø), but conditions in which marines operate are very close to conditions expected above the Circle. Here, training is focused on tactical training and offensive operations.

In this respect, Gen. Neller was one of the most well-known voices underlying the value of cold-weather training (Rodman 2019)<sup>296</sup>; he also claimed that the number of rotating marines should be increased (Snow 2018)<sup>297</sup>. Moreover, Neller and the Chairman of the JCS themselves visited the company in Norway in 2017. The importance of the Rotational Force wanted by Neller is remarkable if compared to the usual training conditions of the Marine Corps, which used to be performed at the Marine Corps Mountain Warfare Training Center (Bridgeport, California) and Fort McCoy (Wisconsin)<sup>298</sup>.

As a direct consequence of the deployment of the Rotational Force (*Military.com* 2017; Snow 2017) and following complaints of marines stationed in Norway, the Marine Corps has invested \$12.75 million to buy sets of the NATO ski system for scout snipers, reconnaissance marines, and part of the infantry (Seck 2017) and in January 2018, in response to complaints from marines stationed in Norway, the Marine Corps issue two

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<sup>294</sup> Training centers are strengthening the use of maps, protractors, and compasses or the use of specific skis (*White Rocket, Jager*).

<sup>295</sup> <https://www.defense.gov/observe/photo-gallery/igphoto/2001871654/>

<sup>296</sup> But, noted Rodman (2019), “[I]f cold-weather training were the ultimate goal, the Marine Corps could remain within the United States and not trigger the geopolitical ramifications and logistical headache of rotating marines through a foreign country”. The major results from the rotational presence are indeed that of reassuring NATO and the Norwegians through an anti-Russian presence in the region (Rodman 2019).

<sup>297</sup> The number of marines deployed in Norway increased from 300 to 700.

<sup>298</sup> During the Cold Weather Operations Course from December to March.

requests for information for uniforms for intense cold, reaching temperatures to 50 below zero<sup>299</sup> (Snow 2018).

### 3.2.2 Military-led exercises in Arctic conditions

One of the most straightforward ways to adapt to climate change is to simulate warfare operations in a changing environment. For this reason, military exercises above the tactical level, requiring military and civilian actors to test combat readiness following virtual strategic purposes, can provide substantial evidence on how tactical and strategical challenges can be overcome. Generally, both national or international exercises are specifically designed to improve cooperation between geographic and functional Combatant Commanders, across different AoR, and between military and civilian agencies. In the temporal framework taken into consideration, exercises in the Arctic have been conducted within different contexts (NATO, bilateral and multilateral) and through the performance of anti-submarine warfare and cold weather and mountainous training. Some of them are hosted by other states (e.g., *Trident Juncture*, *Arctic Challenge*, *Cold Response*), others are conducted on the US homeland (e.g., *ICEX*, *Arctic Eagle*<sup>300</sup>, *Arctic Edge*, *Bold Quest*<sup>301</sup>). Here those with considerable US participation will be analyzed. Little information is publicly available on military exercises, however, both on the plans performed and on the ties between them or between engaged agencies. Keeping in mind this limitation, the following paragraph will be looking for 1) some claimed link of the exercise to the intensification of climate change effects, 2) the relevance of the exercises for homeland defense.

The need for more effective exercises in the Arctic has been shaped also by the poor results of a war game held in September 2011, 13-16 by the US Naval War College (War Gaming Department). The aim of *Fleet Arctic Operations Game* was to identify gaps limiting maritime operations in the Arctic. The final result was generally negative. Even though “[P]layers were selected based on their specialized knowledge of the Arctic region or functional expertise related to planning, operations and cold weather systems” (Gray, Bergey and Berbrick 2011, 4), the game demonstrated that the US Navy was “inadequately prepared to conduct sustained maritime operations in the Arctic region” (Gray, Bergey and Berbrick 2011, 6). Moreover, US forces were “characterized by an inability to reliably perform and maintain operations in the austere Arctic environment” (Gray, Bergey, and Berbrick 2011, 5). Since that moment, military-led exercises have been characterized by more and more sense of urgency in their missions and tactical requirements, displaying in some cases (especially in

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<sup>299</sup> Such as fast-drying and water repellent, with gloves able to work with touchscreen devices (Snow 2018).

<sup>300</sup> Held by the Alaska National Guard.

<sup>301</sup> Held by the Air Force National Guard.

exercises taking place on the homeland) a direct link to climate change, as it is evident in the last editions of some of the most important exercises held by the US.

The credibility of warfare under Arctic conditions is at the center of multinational exercises taking place in the European Arctic which apparently do not seem directly related to climate change in the actors' perspective (while it is not excludable), but rather to the increasing tensions in the Circumpolar Arctic. An example is exercise *Cold Response*, one of the oldest exercises under harsh environmental conditions held by Norway as a host nation since 2006, to which also NATO countries are invited (US sends regularly marines under EUCOM). The 2016 edition, as "the largest multinational maneuvers conducted in Europe's Far North since the end of the Cold War " (Klare 2019, 120), was meant to enhance the fighting skills of combat units in Norway's near-Arctic environment during several weeks in the snow-covered mountains near Trondheim. The scenario pictured an aggressor entering Norway from above the Arctic Circle, where US marines conducted amphibious landings along Norway's coastal fjords while others flew to airstrips inland until US and Norwegian forces joined together (Klare 2019, 121). According to Klare (2019, 123), thanks to whom information on *Cold Response* was retrieved, "it is very clear that American military officials are seriously contemplating the possibility of great-power combat occurring in the Arctic region – arising not just as an extension of a clash erupting elsewhere in Europe but *independently*, as a consequence of developments in the Arctic itself". The comment centers a point in favor of the credibility of warfare in the Arctic. An important feature at the center of 2020 exercise was the focus on amphibious landings<sup>302</sup>.

Under NATO article 5, the US holds exercise *Trident Juncture*, a defensive exercise designed to improve readiness and interoperability in different contexts, including the European Arctic (North Atlantic, Baltic Sea, and the airspace of Finland and Sweden). Its aim in 2018 was to test NATO's ability to plan and conduct a major collective defense operation – from troop training at the tactical level, to command over large elements of a NATO force, in Arctic conditions. The exercises, under EUCOM, feature the Army, Navy, the Air Force, and the largest part of the military belong to Marine Corps (Rempfer 2018). For the US, *Trident Juncture* tests in particular the logistical ability of the US Marine Expeditionary Force (based at Camp Lejeune, North Carolina) to transport personnel and equipment across the Atlantic. As noted by a commentator, "[T]he transition to prepare for the exercise was in itself for these Marines a test of their ability to rapidly deploy to Norway and quickly integrate into the NATO command structure, should they ever be called upon to fight" (Rempfer 2018). The exercise, taking place in Norway and surrounding areas of the North Atlantic and the Baltic

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<sup>302</sup> Norwegian Armed Forces, accessed on 8/10/2020: <https://forsvaret.no/en/coldresponse>. *Cold Response* took place also in March 2020, but was terminated earlier due to Covid-19 pandemic. An important feature at the center of 2020 exercise was the focus on amphibious landings (Norwegian Armed Forces, accessed on 8/10/2020: <https://forsvaret.no/en/coldresponse>.)

Sea, including Iceland and the airspace of Finland and Sweden<sup>303</sup>, seems not to be perceived as a direct response to climate change, rather as a response to the indirect effect of increasing tensions in the region.

Exercises held on the homeland are more evidently related to climate change and the possibility of the outbreak of conflict in the Arctic. Of particular importance is *ICEX*, which has been widely related to climate change impacts in the Arctic. *ICEX* is a five-week exercise held every two years that allows the Navy to assess its operational readiness in the Arctic, increase experience in the region, advance understanding of the Arctic environment and continue to develop relationships with other services, allies, and partner organizations (defense.gov 2018). The exercise is conducted above the Arctic Circle since 2016, the year in which the US and other NATO allies participated (Canada, UK, Norway, Japan). In 2018 submarines from USA and UK (*USS Connecticut SSN 22*, *USS Hartford SSN 768*, *HMS Trenchant S91*) conducted multiple arctic transits, a North Pole surfacing, scientific data collection, and other training evolutions during their time in the region<sup>304</sup>. In March 2020, the exercise was held in the Barents Sea, for the first time since the mid-1990s with two submarines (*USS Connecticut SSN22*, *USS Toledo SSN 769*). *ICEX* envisages the establishment of a temporary camp on an ice floe, serving as a temporary command center (*Camp Seadragon*) and supporting submarine operations, research, and training<sup>305</sup>. According to official statements, in 2020 DoD officially mentions climate change and links it to the exercise itself:

“[C]limate change is affecting every country on the globe, and the U.S. military must adapt to provide defense, officials said. Whether it is increasingly dangerous floods, longer-lasting droughts, more and more powerful hurricanes, typhoons or cyclones, service members must change to operate and win in these new environments, they added. Climate change is particularly fast in the colder regions of the globe, with glaciers and ice caps melting at alarming levels. That change means new operational environments.”<sup>306</sup>

and

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<sup>303</sup> EUCOM: <https://www.eucom.mil/article/39490/us-forces-ready-for-nato-exercise-trident-juncture-18>

<sup>304</sup> DoD, 2018: <https://www.defense.gov/Watch/Video/videoid/588248/>

<sup>305</sup> NORTHCOM, 2018: <https://www.northcom.mil/Newsroom/Article/2104690/us-navy-kicks-off-icex-2020-in-arctic-ocean/>

<sup>306</sup> DoD, 2020: <https://www.defense.gov/Explore/News/Article/Article/2180254/us-british-arctic-exercise-shows-us-concern-for-region/>;

see also NORAD, 2020: <https://www.norad.mil/Newsroom/Article/2104840/us-navy-kicks-off-icex-2020-in-arctic-ocean/>

“[...] climate change has opened that possibility. The Arctic ice cap is shrinking, and there is the possibility that a route may open for at least part of the year. The Arctic region above Russia is seeing the same warming trend.”<sup>307</sup>

In the North American Arctic also exercise *Northern Edge* is held. *Northern Edge* is a joint training exercise hosted by US Indo-Pacific Command, including approximately 10,000 US military personnel operating in central Alaska and the Gulf of Alaska in mid-May 2019. It takes place in Joint Pacific Alaska Range Complex, a training venue integrating all domains. For the first time in Alaska, in 2019 the Theodore Roosevelt Carrier Strike Group took part in the exercise. Its commander, Rear Adm. Dan Dwyer, claimed that

“[T]he Arctic ice cap is as small as we’ve seen in our lifetime, and this gives rise to increasing trade routes and sea lanes that are open more times of the year, so it’s incredibly important that we as an Arctic nation continue to operate in this area to protect this vital area to our national defense.” (Eckstein 2019).

Its relation to a changing environment has also been expressed by Gen. Thomas Bussiere, a senior military officer in Alaska (*Airman Magazine* 2019).

Even closely related to homeland defense is exercise *Arctic Edge*, a biannual joint exercise led by Alaska Command (which serves as the host headquarters), under NORAD (Canada and US) and NORTHCOM. Arctic Edge aims to validate concepts that emerged during exercise *Vigilant Shield* (an annual exercise training NORAD and NORTHCOM). The very point of *Arctic Edge* in March 2018 was that the traditional focus of the exercise on defense support to civil authorities following a natural disaster was abandoned in favor of a focus on the defense of the homeland in extreme cold weather conditions (DoD 2018). It is noteworthy that the culminating event of 2020 *Arctic Edge* was an assault on a simulated enemy in mountainous areas (Bouska 2020). The focus was retained also in 2020 (Bouska 2020). In this regard, Gen. O’ Shaughnessy, Commander of NORAD and NORTHCOM, placed great emphasis on the relevance of *Arctic Edge* 2020, stating before the Congress that it “will play an important role in validating requirements that will allow us to deter, detect, and defeat potential adversaries along the front line of our nation’s defenses” (O’ Shaughnessy 2020b, 4).

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<sup>307</sup> DoD, 2020: <https://www.defense.gov/Explore/News/Article/Article/2180254/us-british-arctic-exercise-shows-us-concern-for-region/>

### 3.2.3 Strengthening maritime presence in the Arctic

It goes without saying that in an ice-free Arctic maritime presence will be crucial. Indeed, operability in an ice-free Arctic has been the first concern of the actors engaged in adaptation. As seen in Chapter IV, the very beginning of the adaptation process was operating in a maritime domain characterized by ice-free conditions (Office of Naval Research *et al.* 2001; Pittenger and Gagosian 2003; Weir 2005). From what has emerged from previous analysis, the need for a maritime presence in the Arctic to secure US goals has been then incorporated into Arctic strategies, on condition that domain awareness is achieved (DoD 2011; DoD 2013; DoD 2016). The argument has then been discussed in related forums (Bowes 2009) and thoroughly addressed by the Navy's *Roadmaps* (TFCC 2009; 2014). As expressed by the mentioned evidence, maritime presence is a means for several fundamental related DoD missions: concerning homeland defense, it is a means for *maritime security* (protecting sovereignty and maritime resources, freedom of navigation), *power projection* (deploying and sustain forces to respond to crises, contribute to deterrence, and enhance regional stability), *sea control, air, and missile defense*<sup>308</sup>. From a symbolic point of view, maritime presence is also a blueprint of a state's engagement in the region. How much has been maritime presence strengthened throughout the period taken into consideration? The issue will be analyzed through 1) the recapitalization of the icebreaker fleet under the Coast Guard, accomplished in collaboration with the Navy and DoD, 2) the reinforcement of the Navy's presence in the North American Arctic, 3) the construction of a strategic port in the Arctic.

Icebreakers are traditionally one of the symbols of a state's presence in iced seas, and the need for an icebreaker fleet is clearly related to the opening of the Arctic, in which environmental conditions will still pose severe impediments to operability. The presence of icebreakers is currently one of the most widely discussed issues concerning security in the Arctic, and in particular, the status of the US fleet is a matter of concern<sup>309</sup>. The status of US icebreakers and the need for a general recapitalization of the fleet has been an issue of national security at least since 2012, the year in which the Coast Guard assessed several gaps in Arctic capabilities, including communications, infrastructure, maritime domain awareness, and icebreaking (Mak, GAO 2020). The issue gained importance in 2015, and also public opinion began debating over the so-called "icebreaker gap" (Judson 2015).

The icebreaker gap is given by both the quality and quantity of the icebreakers. Currently, the Coast Guard possesses three icebreakers: an operational heavy breaker (*USCGC Polar Star*), its sister *USCG Polar Sea* deactivated in 2010, and an operational medium

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<sup>308</sup> The issue of the relevance of maritime presence for DoD missions has been simplified. For a comprehensive and detailed outline on how much maritime presence can contribute to DoD missions see for example DoD (2011), Appendix 1.

<sup>309</sup> The Navy and DoD are both participating in the process of recapitalization of the icebreaker fleet. For this reason, the icebreaker issue has been considered in the analysis.



icebreaker (*USCGC Healy*)<sup>310</sup>. Only two of them are operational (*Polar Star* and *Healy*) and for this reason, the condition of the fleet has been at the center of the debate: *Polar Star* was commissioned in 1976 and serves both in the Arctic and in Antarctica, so in case *Healy*, the newest and most technological US icebreaker (commissioned in 1999), may suffer again from a technical breakout<sup>311</sup>, the US will not be able to grant icebreaker presence in the region. The number of icebreakers operated by the US compared to other Arctic states is also a cause of concern. At the moment, Russia has 38 active icebreakers<sup>312</sup> (the largest icebreaker fleet in the world) and is planning to build the world's largest nuclear icebreaker (*Arktika*)<sup>313</sup>, and China, which entered the scramble very recently if compared to the other states, currently operates two icebreaking ships (*Xue Long* and *Xue Long 2*) and has been building a nuclear icebreaker since 2018.

Actors have addressed the icebreaker gap quite recently, but remarkable steps have been taken considering US icebreakers' poor status. In 2015 during his visit to Alaska, President Obama issued a public call for new icebreakers to be built for the Coast Guard *in response to the opening of the Arctic* (Holmes 2014). The pledge came after Coast Guard Commandant Adm. Paul Zukunft at the prestigious National Press (2015) called for more icebreakers to assert US sovereignty in the militarizing Arctic. The process was interrupted in 2017 when despite Trump's public pledge, funding has been diverted to building a wall between the US and Mexico. The fact has been generally viewed as a case of disinterest of Republicans concerning climate change-related issues and the de-prioritization of the icebreaker gap has raised concern (Kusnetz 2019), even among Trump sustainers (Prine 2018). It was not until 2019 that funding has been allocated to the establishment of the fleet in collaboration with the Navy. The Navy will indeed fund the first Coast Guard icebreaker to be built under the joint *Polar Security Cutter Program* (under the *National Fleet Board*). After the government shutdown, \$665 billion were allocated for a new heavy icebreaker and \$20million for a second vessel and \$740 million for new cutters to be stationed in Alaska (Werner 2019). For FY2019 has been requested a fund of \$750 million to begin the construction of a new heavy polar icebreaker to enter service in 2023.

As pointed out by Paul Avey (2019), however, many of the specific military challenges coming from Russia or China in the Arctic are independent of icebreakers "and best dealt with in other ways". Indeed, despite the role that icebreakers can play for defense purposes (in 2015, Adm. Zukunft proposed icebreakers with military capabilities), denial of access,

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<sup>310</sup> The National Science Foundation possess another medium icebreaker (*Nathaniel B. Palmer*) supporting Antarctic scientific research.

<sup>311</sup> As happened in 2018 (Woody 2018) and 2020 (Lopez 2020).

<sup>312</sup> Data retrieved from *The Arctic Institute*:  
<https://www.thearcticinstitute.org/countries/russia/> accessed on 17/09/2020.

<sup>313</sup> UPDATE: The *Arktika* icebreaker sailed for the first time in September 2020 (Odinova 2020; Nilsen 2020).

defense from missile strikes against the homeland, the ability to move forces from the homeland, are all purposes which an icebreaker fleet cannot address at the moment (Avey 2019). While the filling of the icebreaker gap clearly demonstrates a growing concern over adaptation to Arctic conditions, it does not provide significant indicators on adaptation for homeland defense purposes, bearing in mind that the threat posed by Russia (posing severe challenges to the US “gap”) is still mostly an all-shore threat, given that great part of Russia’s military capabilities are located on the Russian homeland. Nevertheless, three considerations can be pointed out. As first, as said before, for the purposes of this research the icebreaker gap is a useful (but not fundamental) indicator, despite the popularity of the issue and the evidence that has been produced throughout the years and is proof of some renewed attention over the Arctic. Then, icebreakers are a “symbolical” message of US presence (Shankman 2018). Finally, comparing assets between different states (Russia has over 7,000 km of Arctic coastline) makes minimum sense.

More useful but less debated evidence comes from the Second Fleet's reactivation and the need for a deep-water port on US territory. Falling directly within homeland defense is the re-activation of the Second Fleet, a step undertaken in 2018: as the Arctic Ocean will be increasingly ice-free, stated the TFCC in 2014 (2014, 18), surface vessels will be fundamental for operability in open water. As it was pointed out before, since the last years of the Cold War the shortage of surface vessels deployed in the Arctic has been an enduring gap for the US. In this sense, the Second Fleet's re-activation, responsible for the US East Coast and the North Atlantic, is an impressive step towards a more effective and extended maritime presence in the US Arctic. It came, however, in a very silent way.

Reactivation occurred after seven years since the Fleet had been disestablished in 2011 after a perceived loosening of threats coming from Russia. On May 4, 2018, CNO Adm. John Richardson announced its reactivation, and a year later, on May 29, 2019, the Fleet reached its initial operational capacity. The reactivation of the Fleet concretely fulfills the objectives stated by the 2018 NDS concerning the era of “great power competition” in the Arctic (especially versus Russia, as proven by the participation of the Second Fleet to BALTOPS, a NATO exercise in 2019<sup>314</sup>). The focus on the Arctic has been signaled since the beginning through the establishment in September 2019 of a temporary expedition Maritime Operations Center in Keflavik, Iceland. It goes without saying that a fleet operating in the Arctic through both surface and undersea vessels will be a substantial response to the whole debate that has shaped the Navy and its related actors until the 1990s. However, it is noteworthy that there is no place in strategies released under the Trump administration on the Fleet's role in the new Arctic posture. Even the website of the Commander of the Second Fleet<sup>315</sup> has no mentions of climate change. Moreover, it is also worthy of attention the fact that the connection between the Navy’s operability and climate change effects on Arctic

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<sup>314</sup> [https://www.nato.int/cps/en/natohq/news\\_166717.htm?selectedLocale=en](https://www.nato.int/cps/en/natohq/news_166717.htm?selectedLocale=en)

<sup>315</sup> <https://www.c2f.navy.mil/>

operations goes no more through the TFCC, which was shut down without releasing a final report (with no mention of how the TFCC achievements will be incorporated into Navy's strategy) and under low mediatic coverage<sup>316</sup>.

It is also surprising that neither the Navy nor the Coast Guard has permanent bases in the Arctic<sup>317</sup>. Since 2012, the Coast Guard has been advocating the establishment of infrastructure in the Arctic comparable to the usual "shore-based forces, small boats, cutters, and aircraft supported by permanent infrastructure and significant operating experience," rather than relying uniquely "on little infrastructure and limited operating experience," as claimed by the Coast Guard Commandant Admiral at the time (Papp Jr. 2012). At the end of 2019, NDAA Congress requested a report by the Secretary of Defense, in consultation with the Chairman of the Joint Chiefs of Staff, the Commanding General of the United States Army Corps of Engineers, the Commandant of the Coast Guard, and the Administrator of the Maritime Administration, on the establishment of a strategic port in the Arctic<sup>318</sup>.

### 3.2.4 Thawing permafrost effects on military installations

Adapting to the effects of thawing permafrost has been probably one of the most macroscopic initiatives taken as a response to climate change in the Arctic, similarly to what has been accomplished against rising sea level raise affecting military installations on the US East Coast and in some international bases (Foley 2012). This paragraph will search for some evidence on 1) sequencing of measures undertaken by actors.

The problem has been identified quite recently (CNA 2014, 26; DoD 2015, 5; DoD 2014, 7-8; DoD 2016, 13; Congress 2018; DoD 2019, 3, 6) and attention has progressively intensified. It is worth noting that the issue has not been widely addressed at the beginning of identification<sup>319</sup>: the issue was presented in the CNA second report on climate change CNA (2014, 26), then incorporated into DoD *Climate Change Adaptation Roadmap* (2014, 7-8), and following the newborn DoD environmental. Finally, the issue gained particular prominence in the last DoD Arctic Strategy (2019, 3, 6), where thawing permafrost is more formally addressed as a concern for the homeland itself. Allegedly, considerable input has been given by the DoD Report on the effects of climate change to the DoD itself released at the beginning of 2019, which, as said before, cataloged current and potential vulnerabilities of US military installations. The Report listed only one military installation (Fort Greely, Alaska, belonging to the Army) as currently and potentially vulnerable to thawing permafrost.

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<sup>316</sup> The disclosure of the shutdown of the TFCC was signaled by *E&E News* (Athey 2019).

<sup>317</sup> Coast Guard icebreakers are homeported in Seattle, Washington.

<sup>318</sup> FY 2020 NDAA, sec. 1752.

<sup>319</sup> In its assessment on the vulnerabilities of US bases (Foley 2012), the American Security Project only marginally addressed the impacts of thawing permafrost. Nor DoD first *Arctic Strategy* (2013) did not mention explicitly the problem.

If tested against evidence coming from less formal sources, the Report seems considerably conservative, however.

Since 2011, both the Strategic Environmental Research and Development Program (SERDP, DoD) and the Coast Guard have been involved in projects on the study of the impacts of thawing permafrost which acknowledged the role of climate change<sup>320</sup>. Indeed, most of Alaska (85%<sup>321</sup>) is located on permafrost, namely ice, rock, and soil that stays below freezing. As anticipated, in some parts of Alaska, permafrost is thawing as a consequence of the raise of the global mean temperature<sup>322</sup>, and this requires consistent engineering projects as a great number of military facilities are actually constructed on permafrost. A feedback effect, moreover, contributes to the problem, “as the heat generated by construction can cause permafrost to thaw further, damaging the new construction to the point of condemnation” (Aston 2019). A possible solution consists of thawing it completely, freezing it, or excavating it in order to replace it with more stable materials. In this sense, the Army and the Air Force have been active, both through the Army Corps of Engineer, which holds a long history regarding adaptation in the Arctic (as reconstructed in Chapter III). Gary Larsen (US Army Corps of Engineers Engineering Resource Development Center’s Cold Regions Research Engineering Laboratory operations manager) said to the official magazine of the Air Force: “[R]eally, it’s more about adapting, I think, than trying to hold back the change, because I don’t think we can. The changing climate is going to affect military infrastructure in the Arctic and around the world.” (in Arp 2019). The effects of permafrost have been recently commented by Lt. Gen. Thomas A. Bussiere, senior military officer in Alaska<sup>323</sup>, mentioning climate change directly:

“The changing environment both in the Arctic and in Alaska based on climate change is providing the unique challenges, whether that’s coastal erosion or decreased permafrost. There will be challenges for the infrastructure that will have to be addressed, whether that’s along the coastline or with our installations, but I’m confident that the engineering professionals in the Air Force and the DoD would be able to address that.” (in Aston 2019).

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<sup>320</sup> Coast Guard: *Understanding the Impacts of Permafrost Change: Providing Input into the Alaska Integrated Ecosystem Model* (2011-2014); SERDP, Environmental Security Technology Certification Program (and US Army Corps of Engineers): *Effect of Arctic Amplification on Design Snow Loads in Alaska* ([anni]).

<sup>321</sup> DoD 2019a, 7.

<sup>322</sup> Which also causes record hot summers, burning organic matter and vegetation which “holds” permafrost.

<sup>323</sup> Commander of Alaskan North American Aerospace Defense Command Region, North American Aerospace Defense Command; commander, Alaskan Command, US Northern Command; commander, Eleventh Air Force, Pacific Air Forces, at Joint Base Elmendorf- Richardson, Alaska.

As it emerged, three other major US military bases located in south-central Alaska (Eielson, Fort Wainwright, Fort Greely, and Clear Air Force Base) are experiencing the effects of thawing permafrost in addition to Fort Greely. The munitions facilities at Eielson AFB, for example, have been entirely replaced as a consequence of unstable ground. In response to this phenomenon, at Eielson AFB the US Army Civil Engineers is using underground water heaters to thaw permafrost to provide a stable foundation for an F-35 missile maintenance facility. The DoD is building over 40 facilities to support the basing of two squadrons of F-35 Lightning II at the base (cit. Aston 2019), a step which has becoming increasingly important since the base will host in April 2020 two operational F-35 Lightning under the Eielson AFB Regional Growth Plan<sup>324</sup>:

“Hot water is pumped through the pipes to completely thaw the permafrost layer. As the water cools, it is pumped back to the surface to be heated again. The engineers continue to monitor the ground temperature throughout the weeks making sure the permafrost is thawing evenly and completely across the site. Once the permafrost is completely thawed, they remove the pipes and compact the soil before construction. After the building is constructed, the heat from the building will ensure the soil below doesn’t freeze again” (Aston 2019).

Wildfires experienced by Clear Air Force Station, Alaska (DoD 2019a) are also a consequence of thawing permafrost: the more water evaporates, the more rain is produced, as well as more lightning, which in turn sets off more wildfires (Karlovitch *et al.* 2019). The same is occurring at Joint Base Elmendorf-Richardson, affected also by floods.

In addressing the effects of thawing permafrost and in general military installations’ vulnerabilities to climate change, a disproportion between the highest and lowest levels of strategy emerges. While the issue seemed carefully initiated under Obama, through the projects on the study of thawing permafrost effects for FY 2011 and later the establishment of a DoD environmental policy (made of Executive Order 13653, DoD Directive 4715.21, and systematic DoD reports on vulnerabilities), under which military installations’ vulnerabilities are addressed, the framework faded since 2016. Nevertheless, DoD policy on installations’ vulnerabilities has resisted, as proven by 2019 *Report* on the effects of climate change. In the end, however, despite the *Report* provides a useful overview on vulnerabilities and contains language of climate change, it lacks the sense of urgency and in-depth analysis that is characterizing the actual management of the effects of thawing permafrost.

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<sup>324</sup> The plan brings \$500 million in infrastructure, including hangars, housing, maintenance facilities and simulators to support 3,500 airmen for the F-35 mission. See: Fairbanks North Star Borough (2018).

### 3.2.5 Realignment of command arrangements for the Arctic

The realignment of the Arctic under a unified combatant command had been already suggested by CNA (2014, 3) and is still currently discussed by commentators and analysts. Given that a realignment of command over the Arctic has been generally perceived as a necessary step for fostering prompt response in the Arctic in case a threat may emerge, this paragraph will check 1) whether any realignment has been actually pursued.

Responsibility over the Arctic region used to be shared by three combatant commanders: NORTHCOM, EUCOM, PACOM (plus NORAD). In 2002, after a revision of the combatant commanders' AoR and the establishment of NORTHCOM, the *Unified Command Plan* (UCP) gave NORTHCOM responsibility for North America and designed its AoR by including a large part of the Arctic, including Alaska and the Bering Strait. The remaining area of the Arctic region was realigned under EUCOM and PACOM excluded from the Arctic (Feickert 2013). Responsibility for the Arctic was thus split into two areas: one including Alaska, Canada, and North Pole (NORTHCOM) and the other (EUCOM) stretching from Greenland to the Chukotka Peninsula in the Far East (Russia). This latter maintains relationships with NATO allies involved in the Circumpolar Arctic security, such as Denmark and Norway.

The chain of command was lightened by the decision undertaken in UCP 2011 to give NORTHCOM commander the responsibility to advocate for Arctic capabilities (Bennett 2011). This means that NORTHCOM commander "can also advocate and endorse requirements that may come from another combatant command, another service, that are in support or could be used to facilitate activities and operations in the Arctic" (Meizinger 2013). The three commands cooperate in executing exercises such as *Northern Edge* or *Arctic Edge* and in multidomain training at Joint Pacific Alaska Range Complex.

At the moment, however, the situation is more complex than this, since some combat forces active on the homeland itself (Alaska) are still assigned to PACOM<sup>325</sup>, making operational readiness difficult. The Alaskan Command (ALCOM), headquartered at Joint Base Elmendorf-Richardson (Anchorage, Alaska), is a joint subunified command responding to both PACOM and NORTHCOM<sup>326</sup>. The task of ALCOM is to conduct homeland defense, civil support, mission assurance, and security cooperation within the ALCOM Joint Area of Operation (JOA)<sup>327</sup>. It coordinates all military activities in Alaska, planning and conducting

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<sup>325</sup> Including the 11<sup>th</sup> Air Force, responsible for organized training and equipping air forces in Alaska, Hawaii and Guam.

<sup>326</sup> ALCOM was deactivated in 1975, after the Vietnam War. Once reactivated in 1989 under after a period under USPACOM, it has been located under NORTHCOM (this latter, established in 2002).

<sup>327</sup> [https://www.jber.jb.mil/Units/Alaskan-Command/#:~:text=Alaskan%20Command%20\(ALCOM\)%20is%20a,and%204%2C700%20Guardsmen%20and%20Reservists](https://www.jber.jb.mil/Units/Alaskan-Command/#:~:text=Alaskan%20Command%20(ALCOM)%20is%20a,and%204%2C700%20Guardsmen%20and%20Reservists). accessed on 2/09/2020

joint training for rapid long-range deployment missions under PACOM (Ohotnicky, Hisey, Todd 2012, 59). While ALCOM is formally under NORTHCOM, its forces are mostly part of PACOM. ALCOM subordinate commands include the commander, 11<sup>th</sup> Air Force, and commanding general, US Army ALASKA (USARAK).

To more effectively manage its responsibilities, NORTHCOM created in 2003 Joint Task Force-Alaska (JTF-AK)<sup>328</sup>. Since JTF-AK, whose mission is to deter, detect, prevent and defeat threats within the Alaska Joint Operations Area (AK JOA), was primarily manned and executed by ALCOM, a single commander and staff must report to two different combatant commanders (namely NORTHCOM and PACOM) (Ohotnicky, Hisey, Todd 2012, 59). Moreover, JTF-AK has no maritime capability, which is granted by ALCOM (consequently, by PACOM) (Rickard 2012). Thus, even though the 2011 revision of the UCP removed the Arctic from USPACOM's AoR, NORTHCOM real authority is still limited in the region, and this hinders its responsiveness at the operational level, as pointed out by some analysts (Ohotnicky, Hisey, and Todd 2012, 59). Even though NORTHCOM's mission is performed by the provisional JTF-AK, but JTF-AK is totally reliant on ALCOM to conduct its mission, so that

“[I]n essence, USNORTHCOM is dependent on USPACOM's goodwill when it comes to the Arctic. Meanwhile, USPACOM no longer has Alaska or the Arctic as part of its AOR, and thus the region is no longer part of its strategic focus. So there is a risk that national security interests in the Arctic will not be adequately met despite the fact that the ideal mechanism to address these needs already exists” (Ohotnicky, Hisey, Todd 2012, 60).

Some alternatives have been suggested for the designation of a lead combatant command under the next UCP. A possible solution consists in prioritizing NORTHCOM, through the realignment of ALCOM as subunified command and the dissolution of JTF-AK, while leaving forces in Alaska under PACOM (Ohotnicky, Hisey, Todd 2012, 60). The creation of an Arctic Command has also been suggested on the model of the establishment of NORTHCOM after 9/11 (Rickard 2012). Others (Kochis and Di Pane 2017) prioritized EUCOM, following thus a multilateral logic. The reasons for designating EUCOM as the leading command are given by the fact that

“[S]ix of seven non-U.S. Arctic nations fall within EUCOM's AoR; EUCOM'S capabilities are located nearest to the region. EUCOM also provides the nucleus of U.S. support to North Atlantic Treaty Organization (...), which has a strong and growing interest in the region” (Kochis and Di Pane 2017).

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<sup>328</sup> Following according to a *Command Authorities Agreements* between PACOM and NORTHCOM.

At the moment, however, no steps towards a realignment are noticeable.

#### 4. Conclusion

In a time of a denialist administration, important steps for an effective adaptation to climate change have been taken. It goes without saying that the attention displayed for the establishment of an effective environmental DoD policy aiming at both mitigation and adaptation under Obama provided a straighter and more regular base for adaptation. However, a careful analysis taking into consideration both identification and management shows a more complex scenario in which adaptation has been pursued also under the Trump presidency by the selected actors.

On the one hand, the analysis of identification under Trump found that almost no identification of the link climate change-national security (not even climate change-homeland defense) has been consistently pursued at the presidential level. Interestingly, however, the new grand strategy identifies serious challenges deriving from patterns attributable to climate change effects, such as great power competition (China and Russia) in the Arctic. According to the new grand strategy, this should be a zero-sum conflict for control over sea routes and resources. At the same, the presidential position on climate change hampered even the inclusion of the words “climate change” or “global warming” in strategy and policy released by other actors, such as DoD or the Navy. On the other, in the same years identification pursued by all other actors has achieved notable success.

The cooperation between Congress and the military has been evident in the content of 2018 NDAA, which defined climate change as a direct threat to national security and contained important words by senior military officers (as in Langevin Amendment and Nelson Amendment). In this sense, the defeat of the Perry Amendment, reflecting the President's deviant position, furtherly demonstrates that denial at the White House is not shared by military and lawmakers, at least when dealing with the impacts that climate change has on national security. Regarding the assessment of climate change impacts on military facilities, it is worth noting that the process still follows Obama's framework and passes through Congress and DoD. Despite this, it is also evident that a denialist administration does constrain all kinds of initiatives concerning climate change, from the establishment of an environmental policy to the release of strategic documents for adaptation. For this reason, adaptation has been limited by actions such as the silent disestablishment of the TFCC (and consequently the end of Navy's *Roadmaps*), the allocation of funds for icebreakers to the construction of the wall on the border with Mexico, the end of DoD *Roadmaps* due to the rescission of Executive Order 13653.

At the same time, however, it is true that concerning, in particular, the Arctic an independent path has been undertaken by actors towards a more effective adaptation to the changing climate and to address potential threats which are widely identified by both White House, DoD and non-institutional actors. Some considerations can be advanced on this “unbalanced” process. As first, *1) independently from the presence of climate change language, threats to homeland defense quite evidently attributable to climate change are*



*envisaged by almost all actors.* Those threats are seriously challenging US homeland defense in its most basic sense (that of territorial integrity): also 2019 Arctic strategy, as its 2016 version, pointed out that “[T]he Arctic is also strategic terrain because it constitutes the north approached to the United States; DoD must defend the homeland against threats emanating from these approaches” (DoD 2019, 6). Moreover, the overall approach of the Strategy reflects a concerned vision of the Arctic security environment, with serious concerns for the US itself.

On this basis, the analysis moved to demonstrate if such a position (whose last apex was reached in 2019 Arctic strategy) had been followed by effective management: to meet such severe security needs, indeed, the US as an Arctic state must build a credible deterrent, and this must be demonstrated by the evidence. Based on what was reported in par. 3.2, there is relevant evidence to assess that 2) *also management has reflected increasing concern for homeland defense and territorial integrity derived from climate change impacts.* This can be demonstrated through two reasons. Firstly, there has been increasing attention towards actual warfighting in the Arctic (also in the European scenario) since 2015 (e.g., the reclassification of bases from Zone 5 to Zone 7, major exercises at the operational level such as *Trident Juncture* and *Cold Response*, the purchase of more effective extreme cold weather gear, the increase of the Rotational Force of the Marine Corps). Secondly, there is noteworthy evidence decisively accounting for an increasing concern on homeland defense and territorial integrity since 2018 given by the Second Fleet's re-activation, the focus of homeland exercises ICEX and Arctic Edge and recent procedures activated for the construction of a strategic port in the Arctic.

Those measures have been often criticized for not being sufficient to address rising challenges in the region urgently. It is indeed true that there are still evident gaps in the management of climate change effects and that some of those initiatives (such as the reactivation of the Second Fleet) have not been effectively included in a broader strategic framework accounting also for the very concept of climate change as a threat to national security in general. Given the evidence collected and the considerations deriving from it, the next step will be to explain that can account for the overall adaptation process.

## CONCLUSION

Throughout the reconstruction of the adaptation process, it has emerged that US Arctic posture has been consistently revitalized over the years (2007-2020). The reason for such an increasing interest in the Arctic is rooted in profound changes affecting physical geography, namely climate change effects. It has been demonstrated that climate change can have profound impacts even on a superpower (and a reluctant Arctic state) like the US. Moreover, even in time of a denialist presidency, the impacts that climate change has on homeland defense in the Arctic, which was long seen through the lens of major grand strategy objectives and considered an “exceptional” region, have been addressed by DoD, non-institutional actors, and Congress. The Arctic is still a peripheral front but concerns over potential traditional conflict and adaptation to climate change itself for the sake of homeland defense have been consistently shaped by notable initiatives coming from all actors, according to their specific relationship with the Arctic and climate change effects.

The US case demonstrates that physical geography, especially in time of environmental dynamics, still affects national security planning. As outlined in Chapter II, environmental dynamics have been hardly studied by Geopolitics and Realism even though they can pose severe challenges to very traditional concepts, such as the territorial integrity of states. If there were reasons to defend the thesis of the “end of geography” (intended as made of constant factors<sup>329</sup>) in the 1990s, the study of the impacts of environmental dynamics (*in primis*, climate change) from the perspective of Geopolitics and Realism is a valid reason for not underestimate geography as an important driver for national security planning. In addition, a reconsideration of climate change *as a major change in physical geography* in addition to other ways of considering climate change, already extensively discussed in IR literature (e.g., as a *problem* to be solved through international institutions, as a *driver* for conflict at all levels), can provide interesting insights for a comprehensive understanding of such a complex phenomenon.

This last section will present the conclusions of the research. It will be explained on what grounds climate change can be considered a driver for national security planning, at least in the US case, by taking into consideration the outcome of the mechanism (par. 1). It will be then claimed that *proximity to geographical change* is the very cause of the mechanism (par. 2). Finally, there will be pointed out some implications for IR theory and policy making, as well as some thoughts on how the research could be integrated in the future (par. 3).

### 1. The outcome: serious concerns for homeland defense in the Arctic

To consider climate change as a driver for national security planning, actors must be consistently reacting (through identification *and* management) to climate change effects.

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<sup>329</sup> See Chapter I.

Based on the analysis presented in Chapter III, IV, and V, there is *sufficient* mechanistic evidence to claim that adaptation has been characterized by *conscious adaptation (Hypothesized mechanism 2<sup>330</sup>)*: the process undertaken by the selected actors, given the amount of evidence collected, sustains indeed the hypothesis of an adaptation process which, according to the specificities of the case, has achieved a consistent degree of consciousness in responding to climate change effects<sup>331</sup>. Bearing in mind the limited “use” of the Arctic by the US until the 2000s, merely for grand strategy aims<sup>332</sup> as it has been pointed out in particular in the case of World War II, the Cold War, and the 1990s, the outcome of the causal mechanism represents a notable change. It demonstrates that actors have fully engaged in conscious adaptation, “surviving” even a denialist presidency<sup>333</sup>.

This change in Arctic posture consists of a new approach where traditional security issues have been gaining prominence over Arctic exceptionalism. The change should be analyzed since 2007, the year in which a general awareness of climate change effects has been detected. It has been demonstrated how climate change shifted from being “only” a threat multiplier affecting less resilient states (e.g., CNA 2007; QDR 2010; QDR 2014; White House 2015) to represent a growing challenge to homeland defense in the Arctic, given also by a notable geopolitical change such as the opening a new avenue of approach to the continent (e.g., DoD 2013; DoD 2016; DoD 2019). The process of identification has been accompanied by important initiatives, empirically attributable to concern over climate change effects, all aiming towards the building of a credible deterrent in the Arctic (e.g., the improvement of warfighting capabilities, a new focus on homeland defense displayed under military-led exercises, the reactivation of the Second Fleet). This proves that homeland defense in the North American Arctic, at the light of evidence observable in March 2020, is at the moment a major concern.

Furtherly underpinning this statement there is very recent evidence. Climate change is not the only factor that can account for a change in Arctic posture: the Arctic can be also fertile ground for spill-over effects (Byers 2017; Rahbek-Clemmensen 2017), but it is evident that it is climate change itself that accounts for a change in the overall US geostrategic posture in the region. It is worth reporting at this point the concerns expressed by NORTHCOM and NORAD Commander Gen. Terrence O’Shaughnessy over homeland defense and the opening of an avenue of approach to the North American Arctic. In 2018, O’

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<sup>330</sup> See Chapter II, par. 4.3.1.

<sup>331</sup> On this see the next section “The cause: geographical proximity”.

<sup>332</sup> See Chapter III.

<sup>333</sup> *UPDATE (March 2020-December 2020): the Air Force released its first Arctic Strategy in July 2020 (Department of the Air Force 2020). A month before, in June, another important step in adaptation was taken: a presidential memorandum by President Trump required the construction of a “ready, capable, and available fleet of polar security icebreakers that is operationally tested and fully deployable by Fiscal Year 2029” (White House 2020).*

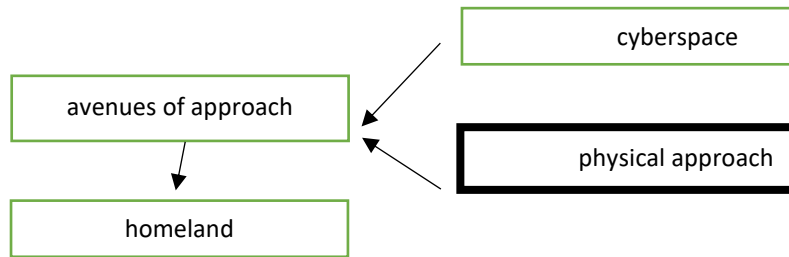
Shaughnessy stated before the 140<sup>th</sup> National Guard Association Conference in New Orleans that the homeland was no longer a sanctuary. “We’re in a changing security environment,” O’Shaughnessy said, “We used to think about the sanctuary we had with oceans and friendly countries to our north and south, but that’s changing with adversaries that are actually able to reach out and touch us now.” (Rempfer 2018). Two years later, the same concepts were expressed in a testimony given in February 2020 and March 2020 to the Senate Armed Services Committee. In the recent hearing, O’ Shaughnessy compared several times the contemporary security environment to that of the Cold War and post 9/11 which led to the establishment of NORTHCOM itself (2020, 8). He claimed that “[I]n the years following the Cold War, our nation enjoyed the benefits of military dominance as well as geographic barriers that kept our homeland beyond the reach of most conventional threats” (O’ Shaughnessy 2020, 1), but “[T]he Arctic is no longer a fortress wall, and our oceans are no longer protective moats; they are now avenues of approach for advanced conventional weapons and the platforms that carry them” (O’ Shaughnessy 2020, 1). This is due to the fact that

“[O]ur adversaries have the ability to threaten our homeland in multiple domains and from numerous avenues of approach. Whether an attack originates in cyberspace or from the physical approaches to the homeland, we cannot deter what we cannot defeat, and we cannot defeat that which we cannot detect” (O’Shaughnessy 2020a, 9).

In particular, “[T]he Arctic affords our adversaries a direct avenue of approach to the homeland and is representative of the changing strategic environment in our area of responsibility” (2020, 15). This condition is derived from “[M]ore consistently navigable waters, mounting demand for natural resources, and Russia’s military buildup in the region” (2020a, 15). Thus, “[T]he Arctic is the new frontline of our homeland defense” (2020a, 16).

In March, O’ Shaughnessy claimed that “[T]he threats facing the United States and Canada are real and significant. The Arctic is no longer a fortress wall, and our oceans are no longer protective moats; they are now avenues of approach for advanced conventional weapons and the platforms that carry them” (2020b, 1). This is due to “[M]ore consistently navigable waters, mounting demand for natural resources, and Russia’s military buildup in the region” which “make the Arctic and immediate challenge for USNORTH, NORAD, our norther allies, and our neighboring geographic combatant commands, U.S. European Command and U.S. Indo-Pacific Command” (2020b, 2). In addition, “China has taken a number of incremental steps toward expanding its own Arctic presence” (2020b, 3).

**Figure 6.1. Factors affecting homeland defense under NORTHCOM and NORAD.**



Source: elaborated from O'Shaughnessy (2020)

## 2. The cause: geographical proximity

The statements by gen. O' Shaughnessy were thus the last, explicit, speeches underlying a possible new focus for NORTHCOM itself. At this point, once demonstrated that the outcome represented a notable change in national security planning (and even geostrategic posture) and that it was related to climate change effects, the role played by climate change in the causal mechanism is to be more carefully analyzed.

On the basis of the analysis, it is evident that climate change retains some causal role in shaping the actors' new course of action - that of defending the homeland even in a region that was once considered a bulwark and then an exception to traditional power politics. Climate change, however, does not have a merely *causal* role: claiming that geography (or changes in physical geography) *causes* an outcome in terms of human activity, indeed, means admitting a deterministic role of geography which is not compatible with the assumptions of this research, which postulates a probabilistic role of geography. On the contrary, climate change has been assumed as a contextual factor<sup>334</sup> that, along with other factors not only related to physical geography, has triggered the process of adaptation. Factors accounting as causes can be related to either domestic and international politics (top-down approach) or the military (bottom-up approach). On this basis, some factors can be taken into consideration as possible causes: 1) *Democratic agenda*, fully responding to the logic of a process which has been directed by politics given the attention devoted by Democrats to climate change, 2) *Arctic interstate relations*, which may have pushed the US towards a major reconsideration of climate change due to its effects on sea routes and resources (fostering international tensions and militarization of the region), and 3) *proximity to climate change*, a possible cause taking into consideration the direct observation and analysis of climate change effects by militaries acting in a changing climate. The three hypotheses on causes will be analyzed in the following lines.

*Democratic agenda.* It is widely known that Democrats have included climate change in their political agenda. Policies developed under the Obama administration indeed targeted both mitigation and adaptation, and, in addressing all agencies, they affected also the defense sector. Moreover, equilibria in Congress prevented climate change and the Arctic (as

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<sup>334</sup> Chapter III.

a region vulnerable to its effects) from being neglected even as an issue of national security. Hence, it may not be surprising (and perfectly logical) that the Obama administration paved the way for a *conscious adaptation* and, indeed, some sequence evidence (namely, the timeline of major grand strategy documents as QDR, DoD Arctic strategy, and Reports to Congress on the Arctic) can lead to this conclusion.

The hypothesis must be dismissed, however. It is undeniable that a Democratic administration amplified and stimulated the adaptation process and that the denialist Trump administration posed severe significant constriction to identification and management, such as the disestablishment of the TFCC, and prevented the very analysis of climate change effects from being pursued by actors. Nevertheless, the acknowledgment of climate change effects took place *before* the establishment of the Obama presidency. As it was reported in the analysis, one of the most striking initiatives in adaptation, namely the establishment of the TFCC, originated as a pre-Obama initiative (2008), when Adm. Roughead asked permission to Adm. Titley (even if it had been unveiled only a year later). This piece of evidence proves that the seeds of the process of adaptation have been planted under Bush, whose relationship with climate change was poles apart with respect to Obama, as widely known. Concerning non-institutional actors, it is worth reminding the release of the groundbreaking CNA report in 2007, this too under the Bush administration. The evidence thus leads to the conclusion that well before the establishment of a Democratic presidency, some actors were already taking into consideration 1) climate change as a matter of national security and 2) the Arctic as a theater in which operability was already affected by climate change effect.

*Arctic interstate relations.* It goes without saying that international tensions deriving from increased access to the Arctic are a fundamental feature in the Arctic security environment. As reported in Chapter V, they are indeed a key-issue in Arctic strategy developed under the Trump administration, for example. However, they cannot be considered the cause of the mechanism under analysis, despite the obvious fundamental impact they regularly played throughout all the timeframe. Account, trace, and sequence evidence demonstrate that the Navy was already at work in studying the effects of climate change in the Arctic regardless of competitors' activities in the region. Firstly, the CNA Military Advisory Board gathered for the first time in 2006, dismissing thus the widespread hypothesis that it was the "Arctic race" (and the Russian symbolical conquest of the North Pole in 2007) that stimulated the national security establishment in considering climate change impacts on national security. Secondly, the Navy was remarkably considering impacts on maritime operability in an ice-free Arctic since 2001, as demonstrated by the Symposium held in Washington D.C. in April 2001, and the release of some notable papers (Pittenger and Gagosian 2003; Weir 2005). On the contrary, the Arctic race seemed to have stimulated the release of the presidential Arctic strategy in 2009<sup>335</sup>, without the noticeable contribution of

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<sup>335</sup> The planting of the Russian flag, as proven by Steinberg (2014) on the basis of interviews with government officials, stimulated the release of NSPD-66.

military services' chiefs<sup>336</sup>, in parallel with an independent path pursued by the Navy and the CNA. Both factors then merged, intensifying the urgency for climate action in general.

*Proximity to climate change effects.* The dismissal of the Democratic agenda and interstate Arctic relations as the cause of the mechanism leads to further consider the role played by military-related actors. In the security community, the operational level is the most exposed to climate change effects, since it responds at the same time to strategic and tactical inputs. In 2015 it was estimated that that climate change affected all combatant commanders (DoD 2015). Going back in time, the CNA Report (2007), the result of cooperation and talks held among combatant commanders, service chiefs, and hard science experts and notable initiative on the impacts of climate change on national security, was "the first time that such an elite body of military leaders expressed their concern over the security implications of climate change<sup>337</sup>." Direct observations of climate change effects, moreover, and how it simulated the beliefs of notable individuals have been repeatedly found: it was the case of Gen. James Mattis (it is known that while serving as commander of the 1<sup>st</sup> Marine Division in 2003 in Iraq, his forces were slowed down by fuel supply<sup>338</sup>), Adm. Lee Gunn (who spent time on shore in Vietnam, experiencing the effects of extreme weather events<sup>339</sup> and became later Inspector General of the Department of the Navy and member of the CNA Military Advisory Board), or BGen Stephen Cheney<sup>340</sup>, later CEO of the American Security Project and member of its Boards of Directors).

As it was argued in Chapter III, before the release of the 2007 Report by the CNA, DoD was hardly considering climate change effects. In that context, the voices of the CNA Military Advisory Board were considerably taken into consideration because of the prestigious *curricula* of the components of the Board, who were respected by all retired military officers. Another proof comes in the form of sequence and account evidence: before being reported into grand strategy documents, climate change impacts on national security were included in operational documents (US Navy, US Marine Corps, US Coast Guard 2007; US Joint Forces Command 2008; US Joint Forces Command 2007; TFCC 2010). This process

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<sup>336</sup> With the exception of CDR James Kraska, who served as principal military drafter of NSDP-66 in 2007-2008.

<sup>337</sup> Foreword by Michael Chertoff (Former Secretary of Homeland Security) and Leon Panetta (Former Secretary of Defense) in CNA (2014).

<sup>338</sup> Wolff (2016). The case of General Mattis has been discussed in Chapter V, par. 2.2.3.

<sup>339</sup> "Climate Change as a Threat Multiplier", webinar hold on 22/09/2020 by the American Security Project.

<sup>340</sup> "I've seen the effects of climate change up close. In 1999, I served as the commander of Parris Island when Hurricane Floyd narrowly missed the island. The hurricane required the evacuation of 7,000 recruits and Marines, and devastated North Carolina. Today, the effects of climate change have only become more extreme, and the threats have multiplied" stated Cheney (2018).

inevitably helped overcome bipartisan positions on climate change, which were a hot partisan topic in US domestic politics.

Proximity to climate change effects thus can be considered a *minimally sufficient explanation* for the empirical process of adaptation to climate change in the North American Arctic. Concerning in particular the Arctic, proximity to climate change is even more evident. The outcome fully reflects the role played by those actors who were closer to climate change effects in the Arctic by historical tradition, *in primis* the Navy. The Navy was operating under the Arctic ice since the 1908s, and coping with issues such as sonar and weapons performance, unique tactics, ice mechanics and distribution, low density water (Weiler 2016, 25). The Navy has historically operated in ice-covered waters, with minimal capability to operate above the ice (Kraska 2014, 265). This made ice-covered operability almost impossible in the case of melting ice, with alarming technical, tactical, and strategical consequences related to climate change rather than that faced by other services, less evident in the case of thawing permafrost. The role played by the Navy may not seem surprising, but it should be remembered that the Navy's presence in the Arctic has massively declined over the years and that while the Air Force and the Army operate the majority of DoD assets in the Arctic, the Navy and the Marine Corps are those that have least operational activity among the five services (Kraska 2014, 265). The Arctic case displays a "causal chain" demonstrating that it was actually the proximity to climate change effects that pushed the causal mechanism. Despite the lack of surface vessels in the Arctic experienced by the US and the major presence of other services (i.e., Army and Air Force), the Navy, due to the specific context experienced by the US, was the closest entity to climate change effects in the Arctic.

### **3. Implications for theory and policy-making**

In the light of the gathered evidence, some considerations on implications for IR theory can be pointed out, regarding the following issues: *climate change as an issue for Realism and Neoclassical Geopolitics, environmental causality in contemporary Geopolitics, and the state as referent object in contemporary Realism.*

Firstly, through the link climate change-territorial integrity, climate change and environmental dynamics do rank also as a state security issue worth of analysis. Realism itself was born from studies rooted in geopolitical approaches and it retained a long relationship with Classical Geopolitics. Such a legacy has been progressively abandoned, but there is still room for geography to be considered. In some cases, climate change (or other environmental dynamics) can affect national security in its most basic sense: the erosion of the typical elements of statehood, *in primis* territorial integrity, poses a basic challenge to state security. It is especially in the case of unpredictable changes in physical geography that the territorial integrity of states can be put at stake, for example by ozone depletion or global warming (Levy 1995). In case one considers environmental dynamics as an exogenous factor, it is evident the extent to which climate change undermines states' relative power and the distribution of material resources, through severe consequences on fundamental security assets, from military installations to combat readiness.



Secondly, the framing of adaptation policies into a causal mechanism has emphasized the role played by environmental causality - a concept highly neglected by contemporary Geopolitics in favor of critical approaches. Environmental causality is still crucial for the achievement of a more detailed picture of international politics: according to Sören Scholvin, one of the three pillars of geopolitics is that of tracing processes and establishing causal mechanisms by “concentrating on the role of geographical conditions therein” (2016, 281). The basic assumptions of Geopolitics correspond to process-tracing methodology, which is centered on the retrieval of causes and tracing processes. In considering climate change as a contextual factor and proximity to climate change effects as the cause of the mechanism, the persisting relevance of environmental causality has been formally detected in the empirical case. Following what argued by Scholvin, the main purpose of the analysis has been that of testing whether “geographical conditions” (a term borrowed by Scholvin; in this case, by “geographical conditions” it is intended climate change in the North American Arctic) could account for an observable outcome (in this case, adaptation) and to retrieve eventual factors in combination to the geographical one (Scholvin 2016, 281), here operationalized, more rigorously than in Scholvin’s account, as contextual factors. Empirical works on environmental causality are still few, and it is thus hard to say, for instance, whether the *empirical* findings of this research can be generalizable, given that (very importantly) *environmental causality* has been detected at least in the case of a highly resilient country.

Indeed, in the absence of contemporary literature on environmental causality (also referred to climate change), this research has followed the logic of a single-outcome study, due also to the hardly generalizable features of the US. A single case cannot thus provide enough evidence to assert the existence of a systematic causal mechanism where proximity to climate change and geography can shape national security planning. The US enjoys a peculiar condition, given by its status, geographical location, and a plethora of contextual factors unique to the timeframe under investigation that cannot make the causal mechanism immediately generalizable. Caution is needed when claiming that it is proximity to climate change that systematically fosters the adaptation process, since adaptation processes are unique to the resilience and location of states. As far as it is not excluded in the future that the theoretical findings on environmental causality could be enlarged to a population of cases, by adapting research design to different questions and puzzles, this does not change the fact that the extent to which Arctic posture in the case of the US has been shaped by climate change over the years, even under Trump administration, is highly significant and that environmental causality still can play a crucial role in national security planning.

Thirdly, this research has found that there is still work for Realism and Geopolitics in researching how environmental causality permeates and moves *within* and *among* their ultimate referent object – the state. The analysis of the adaptation process can thus provide valuable insights on *how* states react to those challenges in order to equalize them more and more urgently (without forgetting that climate change furtherly contributes to persisting challenges deriving from international anarchy). The research has confirmed that in the case under analysis climate security has been produced and shaped *by traditional national security actors* (e.g., civilian security professionals, Secretary of Defense, DoD, senior military officers and government officials). This confirms the validity of the assumptions on which

Neoclassical Realism is founded, according to which systemic factors are transmitted to and assessed by national security élites before resulting in state behaviors. What is interesting to note is the relative absence in the process of NGOs and civil society in defense policy-making. As it will be remembered, the concept proposed by Timothy Wirth and Al Gore of climate change as planetary danger, loved by environmental movements and civil society, have been basically dismissed by DoD and never entered officially into DoD policy. On the contrary, the role played by former government officials (*in primis* Sherri Goodman), security experts (think-tanks), and retired senior military officers providing “ready-to-use talking points and policy drafts for government actors” (Diez, Lucke, and Wellmann 2016, 51) really shaped the process of inclusion of climate change into DoD defense policy.

The different perceptions over climate change urgency and its impacts prove that in the US case climate security policies have been formulated according to *different sensibilities and evaluations* of the actors taken into consideration, and the assessment of proximity to causal change denotes a further distinction to be made *among domestic actors*. This is in line with the key-assumption of Neoclassical Realism, which basically challenges the (traditional) unitary state perspective and claims that domestic factors, including also policymakers’ perceptions and misperception to events, are the bottleneck through which systemic factors are elaborated into state behaviors<sup>341</sup>. At the same time, the analytical framework adopted in this research has retained the distribution of material resources at the international level as the first and principal concern of policymakers. Following this argument, the differentiation among domestic actors can account not only for the evident discrepancy between president Trump’s position on climate change and that held by the majority of defense actors, but also for the different sensibility to climate change among actors not totally *a priori* unsympathetic to taking climate change seriously (for example, the early reaction by the Navy opposed to the reticence of the Army, or the extent of the “climate change mission” felt by some leaders, such as Adm. Dave Titley, Adm. Samuel Locklear, or the renowned members of the CNA Military Advisory Board).

The US case has demonstrated also that among traditional élites non-institutional actors (i.e., civilians and retired military officers) have played a crucial role in defense policymaking by proposing roadmaps and stimulating debate among policymakers and apolitical groups, addressed also to policymakers in office, over climate security issues, so that parts of the 2007 CNA Report have been passed through defense committees and have been included in NDAA. Non-institutional actors have also been active during Trump presidency, urging political action to address climate change impacts on national security. Non-institutional actors, indeed, has been crucial in challenging the mainstream perspective of DoD and the

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<sup>341</sup> As it is well known, the original Neoclassical Realist research framework is structured into variables, where actors’ perceptions are intervening *variables*. As explained in Chapter II, this research, due to the gaps found in contemporary literature, has derived *inputs* from Neoclassical Realism, Ecological Perspective, and Neoclassical Geopolitics, instead of adopting a full-fledged framework. In this research, the strong focus on causality and the adoption of a deterministic assumption of causality, whose reasons are explained in the Introduction, has led to consider the role played by actors according to the logic of a *causal mechanism*.

military in general regarding climate change, that preminent in the 1980s and 1990s, and has been continuously shaping and supporting the following process of adaptation. It stands thus as gap worth of future reflection, the *civil-military relations inside traditional national security actors*, which especially in recent and under-investigated topics can constitute an interesting refinement of the processes through which national security élites (intended as domestic factors responding to systemic factors according to different degrees), are divided. In this, the US case featuring worthwhile (and maybe unique) interrelations among retired senior military leaders, retired government officials still taking part in public initiatives, working or being in contact with think-tanks, and civilian experts. Future reflections should also take into consideration the prestige enjoyed in legislative fora, especially when challenging federal policy. This could provide fresh material in favor of a more and more detailed perspective on the actors shaping defense policy, even among traditional national security professionals.

The fact that climate change can be considered a driver for national security planning in an empirical case has also interesting implications on policy-making. At first, it is curious that high officers from being one of the actors less interested in climate change (in various senses: mitigation, adaptation, considering a very issue for national security) in the 1990s and the beginning of 2000s have eventually ended by being one of the most worried actors in a denialist administration, so that just after Trump's election in 2016, the Secretary of Defense was hailed as "the greenest person in Donald Trump's Cabinet" (Wolff 2016). At least, once triggered by contextual factors and the cause, the process of adaptation has not been significantly stopped and, even though it was constrained by denialist climate policy, has even achieved significant goals. Proximity to climate change, freed from partisan politics under a Republican president (Bush), proved to be a convincing argument for actors, including DoD, in favor of efficient and urgent adaptation to changing conditions. *First-hand experiences with climate change effects* reported by the military have been of particular importance in shaping concerns about climate change impacts on national security which still at the beginning of the century had been dismissed: this was evident in 2018 NDAA or the Armed Services Committee requiring a report on Arctic operations and the Northwest Passage in 2010. For this reason, voices coming from the operational level may be particularly valuable for policy-making not only in relation to climate policy and security but even to geostrategic postures. Inputs coming from those experiencing climate change effects can provide non-partisan and pragmatic data and analysis to policy-makers applicable to various agendas.

This last point paves the way to other questions, including those centered on the interrelations among different institutional actors. For example, it has emerged that Congress has often stimulated and required action from DoD (especially through NDAA) based on testimonies and statements by officers belonging to the operational level: how can be those Congress-military relations be framed? By enlarging the perspective, it can be investigated how different departments concerned with climate change have integrated climate change in their policies; on a smaller scale, DoD climate policy can be furtherly break up and the causal mechanism can be thus integrated with insights on how political values of

senior officials (Secretary of Defense or Undersecretary of Defense) have shaped the process. Future research can also enlarge the argument of revived homeland defense, here analyzed in reference to the specific case of adaptation in the North American Arctic, into a larger DoD perspective over grand strategy developed in the last years.

# APPENDIX

## NOTABLE PRIMARY SOURCES [up to October 2020]

- Interview with John Conger, former Principal Deputy Under Secretary of Defense (Comptroller) (16/06/2020).
- Interview with Sherri Goodman, former US Deputy Under Secretary of Defense on Environmental Security (15/06/2020).
- Interview with Frank Femia, Director and Senior Advisor of the International Military Council on Climate and Security (26/05/2020).
- Interview (written) with Marc Kodack, former Water Program Manager in the Office of the Deputy Assistant Secretary of the Army for Energy and Sustainability, Office of the Assistant Secretary of the Army for Installations, Energy and Environment (22/09/2020).
- Correspondence with Adm. David Titley (2/10/2020).
- Correspondence with an archivist at Naval War College (15/07/2020).

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