

ID Number	Name	Geo-District	Local Team	Contact Details	Location	E or W Coordinate (WGS84)	N or S Coordinate (WGS 84)	Geological Setting	Lithology	Landforms	Official Geosite	Geopark	Protected Area	Other Type UNESCO Sites	Scientific Value	Ecological Relevance	Cultural Value	Aesthetic Value	Socio-Economic Value	Spatial Accessibility	Temporal Accessibility
Progressive numbering	Name	Geographical and geological location	Who is the partner working at the site	E-mail address	State, Region.....			Geological Domain	Type(s) of rocks featuring the climbing wall	Type(s) of landforms featuring the climbing wall	If the site is an officially recognized geosite, and if yes, in which list with the relative importance	Name and status (aspiring, UNESCO Global Geopark - UGGp)	Name and the type (e.g., National Park, Natural Reserve)	If the site has been awarded of another UNESCO label	Scientific importance of the site	If the geology and geomorphology provide an ecological support role	If geology and geomorphology have a role in the location of cultural assets, or if there is a cultural asset in the surrounding of the site	If the site has an aesthetic value	If the site has an economic and touristic relevance, or if it is inserted in a touristic area	Type of access to the site and difficulty of the path	Periods in which the site is accessible
GC-1	Premia Balmatagia	Central-Western Italian Alps (Italy)	University of Milan (Italy)	irene.bollati@unimi.it	Northern Italy, Verbano-Cusio-Ossola Province, Leporine Alps	8°20'22.45" E	46°15'50.20" N	European Alps, Penninic Domain	Micaschist with garnet and quartz lens, local mafic boudins	Vertical cliff modeled by Pleistocene glaciers and by river action. Now inactive gorges.	Geosite in the national and regional lists	None	None	None	It is located within the Baceno tectonic window, where the deepest unit of the Alps outcrop. Glacial and fluvial modeling generates a very representative landscape, featured by several gorges and giant potholes. Several studies have been already performed in the area and geological maps are available.	Not relevant	Not relevant	It is a wide rock cliff with several minerals visible on the surface of the wall. The rock cliff is one of the side of a beautiful gorge.	It is located in an important touristic area of the Italian Alps.	By car (not by big bus)	All over the year except rainy days
GC-2	Zomasco	Central-Western Italian Alps (Italy)	University of Milan (Italy)	irene.bollati@unimi.it	Northern Italy, Verbano-Cusio-Ossola Province, Leporine Alps	8°29'36.16" E	46°08'02.25" N	European Alps, Upper Penninic Domain	Orthogneiss with pegmatitic dykes and crenulation cleavage	Vertical cliffs with signs of structural driven erosion	No	Sesia Val Grande UGGp	None	None	Representativeness of structural deformation i.e. crenulation cleavage	Not relevant	Not relevant	Not relevant	Once a year it becomes one of the attractive point during a county fair dedicated to outdoor activities.	By car	Throughout the year
GC-3	Ornavasso (Im Schlast)	Central-Western Italian Alps (Italy)	University of Milan (Italy)	irene.bollati@unimi.it	Northern Italy, Verbano-Cusio-Ossola Province, Leporine Alps	8°23'56.44" E	45°58'51.77" N	European Alps, South Alpine basement, Intra-Verbano Zone	Mafic granulite with inclined layering and evident plagioclase veins	Fluvial morphology (Streets di Bars) sticity dependent on the structural and petrographic conditions	No	Sesia Val Grande UGGp	None	None	Rocks of the lower crust outcrop showing very interesting structures and a deep perforation is ongoing (DIVE - Deep drilling of the Intra-Verbano Zone). The lithological and structural control on the fluvial morphology is really representative.	Not relevant	The area is characterized by the Cadorna Route related to the First World War; the climbing crag has a Walser name as the municipality is a Walser village. The Walser is one of the most important culture in the Alps.	The panoramic view on the Corni di Nibbio ridge and the Toce Valley	It is located in an important touristic area of the Italian Alps.	By car. Touristic path	Throughout the year
GC-4	Mottarone climbing area	Central-Western Italian Alps (Italy)	University of Milan (Italy)	irene.bollati@unimi.it	Northern Italy, Verbano-Cusio-Ossola Province, Leporine Alps	8°27'38.40" E	45°53'46.51" N	European Alps, Southern Alps, Permian granitic intrusion	Baveno granite (pink)	Weathering and erosion landforms on granites. Lakes morphology.	No	None	None	None	Representative landforms related to granite modeling, very well preserved and relevant for educational purposes	Not relevant	Not relevant	Multiscale landforms related to granite modeling, and the panoramic view on the lakes are really impressive.	It is located in an important touristic area of the Italian Alps. Slow resorts are located on the top of the Mottarone.	Excursionistic path	From late spring to late autumn. Snow impedes the view
GC-5	Fun d' Scotte	Central-Western Italian Alps (Italy)	University of Turin (Italy)	<a href="mailto:cratina.viani@unito.it">cratina.viani@unito.it</a>	Northern Italy, Sesia Valley, Pennine Alps	7°56'15" E	45°52'30" N	European Alps, Middle Pennine Domain, Monte Rosa Unit	Micaschist, Paragneiss	Vertical cliffs showing signs of glacial erosion	No	Sesia Val Grande UGGp	Alta Valsesia Natural Park	None	Not relevant	Not relevant	Walser culture	Not relevant	It is located along the route to approach the Monte Rosa Massif.	Very short path (15 minutes)	Open all year. Best time for rock climbing: May-November
GC-6	Ronco	Central-Western Italian Alps (Italy)	University of Turin (Italy)	<a href="mailto:cratina.viani@unito.it">cratina.viani@unito.it</a>	Northern Italy, Sesia Valley, Pennine Alps	8°5'17" E	45°50'28" N	European Alps, Austroalpine Domain, Sesia Lanzo Zone	Gneiss		Geosite in the Sesia Val Grande UGGp list	Sesia Val Grande UGGp	No	None	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Very short path (15 minutes)	Open all year. Best time for rock climbing: May-November
GC-7	Torre delle Gavine	Central-Western Italian Alps (Italy)	University of Turin (Italy)	<a href="mailto:cratina.viani@unito.it">cratina.viani@unito.it</a>	Northern Italy, Sesia Valley, Pennine Alps	8°6'12" E	45°49'58" N	European Alps, Austroalpine Domain, Sesia Lanzo Zone	Gneiss	Monolith related to a Deep-seated gravitational slope deformation	No	Sesia Val Grande UGGp	No	None	The monolith is the result of a Deep-Seated Gravitational Slope Deformation due to glacier debuldring	Not relevant	Not relevant	Impressive isolated pillar.	Not relevant	40 mins walk from the parking place	Open all year. Best time for rock climbing: May-November
GC-8	Ara	Central-Western Italian Alps (Italy)	University of Turin (Italy)	<a href="mailto:cratina.viani@unito.it">cratina.viani@unito.it</a>	Northern Italy, Sesia Valley, Pennine Alps	8°19'5" E	45°41'58" N	European Alps, South Alpine Domain, Trias Jura sedimentary cover	Limestone	Epigean caves	Geosite in the Sesia Val Grande UGGp list	Sesia Val Grande UGGp	Fenera Natural Park	None	Karst evidences	Not relevant	Not relevant	Not relevant	Not relevant	30 min walk from the parking place	Open all year. Best time for rock climbing: May-November
GC-9	Pietra Romanasca	Central-Western Italian Alps (Italy)	University of Turin (Italy)	<a href="mailto:cratina.viani@unito.it">cratina.viani@unito.it</a>	Northern Italy, Sesia Valley, Pennine Alps	8°17'46" E	45°39'53" N	European Alps, Intrusive bodies	Red porfoid		No	Sesia Val Grande UGGp	None	None	Not relevant	Not relevant	San Lorenzo Castle	Not relevant	Not relevant	20 mins walk from the parking place	Open all year. Best time for rock climbing: May-November
GC-10	Monestrutto	Central-Western Italian Alps (Italy)	University of Milan (Italy)	irene.bollati@unimi.it	Northern Italy, Insa, Pennine Alps	7°50'25.52" E	45°32'17.85" N	European Alps, Austroalpine Domain, Sesia Lanzo Zone	Eclogitic Micaschist with boudins and garnet	Lithostructural control on weathering and erosion patterns. Glacial striae and flow indicators.	No	None	None	None	It is a very known outcrop of the Eclogitic micaschists complex testifying for subduction during Europe-Africa Collision	Not relevant	The area is characterized by the Francigena Route. In addition the viewyards and olive trees cultivated on the terraces where the climbing walls are located, are really famous.	It is a pleasant landscape with castles and wine terraces.	The cliff is located along the route of the Aosta Valley featured by fortified settlements, and nearby the roman amphitheatre of Insa, an important touristic area.	By car and by bus	Throughout the year
GC-11	Sasso del Drago	Central-Western Italian Alps (Italy)	University of Milan (Italy)	irene.bollati@unimi.it	Northern Italy, Chiavenna Valley, Orobie Alps	9°28'00.68" E	46°19'40.56" N	European Alps, Chiavenna mafic complex and Penninic Domain, Tambò nappe	Contact between amphibolite and gneiss	Vertical cliff with signs of differential erosion on amphibolites. Glacial erosion on gneiss.	No	None	None	None	It is a relevant outcrop for the Chiavenna Mafic Complex, and the contact with the Tambò nappe is in the middle of the rockwall	Not relevant	Not relevant	Not relevant	It is located along a road connecting Italy to Switzerland, an important tourist-economic route.	By car and by bus	Throughout the year, without snow
GC-12	Voulismeno Akori	Cretan Carbonate Platform (Greece)	Paloritis UGGp (Greece)	<a href="mailto:lessoulas@rnm.uoi.gr">lessoulas@rnm.uoi.gr</a>	Municipality of Maleviti, Heraklion, Crete, Greece	25° 01'05.15" E	35°19'48.5" N	Tripolita Nappe	Jurassic-Cretaceous carbonate rocks	Vertical cliffs and in some places inverted. The doline has a size of about 100 meters long and 80 meters width and a depth of more than 50 meters at the deepest point formed for the collapse of an ancient hypocaust cave	Geosite in the national and Paloritis UGGp lists	Paloritis UGGp	Wild Life Reserve	None	It is the most representative karst sinkhole of its characteristics in Crete.	A large number of birds find refuge at this doline.	It is linked to local myths and traditions related to the formation of the doline, and to a farmer sin and his punishment by a Saint.	It is of great aesthetic value due to its shape and features about also due to the various colors that the vertical walls have because of the iron and manganese oxides.	The area is visited by tourists as it is promoted by the UGGp. Furthermore it is used by climbers for training.	By car, as it is nearby to a regional road	Open all year
GC-13	Patsos gorge	Cretan Carbonate Platform (Greece)	Paloritis UGGp (Greece)	<a href="mailto:lessoulas@rnm.uoi.gr">lessoulas@rnm.uoi.gr</a>	Municipality of Amari, Rethymon, Crete, Greece	24°34'12.76" E	35°15'28.94" N	Tripolita Nappe	Jurassic-Cretaceous carbonate rocks	Vertical cliffs forms at the two sides of Patsos gorge due to karstic erosion	Geosite in the national and Paloritis UGGp lists	Paloritis UGGp	Nature 2000 area	None	The site has significant scientific regional value. It is a typical gorge developed within carbonate rocks with steep cliffs and considerable depth, hosting water almost all year around, something special for Cretan gorges.	The gorge hosts several important and endemic species of Cretan flora.	Inside the gorge exist a small cave that was used in ancient times as temple for Hermes and now as a chapel for Saint Anthony, receiving many pilgrims every year.	It is of great aesthetic value due to the trees and rare vegetation it hosts, the vertical cliffs of limestone and the water presence.	Several hundreds of tourists use it every year, whereas it acts as a recreation area, with facilities established by Forest Service.	By foot, entering the trail that crosses the gorge	Almost all year, except heavy rainfall
GC-14	La Pediza de Manzanares	Central Iberian Range (Spain)	National University of Distance Education (Spain)	<a href="mailto:manu.garcia@ccia.uned.es">manu.garcia@ccia.uned.es</a>	Sierra de Guadarrama, Madrid, Spain	3°53'16" W	40°44'37" N	Spanish Central Range	Variscan granitoids	Weathering and erosion landforms on granites: Tafoni, polygonal cracks, dykes, etc.	No	None	Sierra de Guadarrama National Park	None	Several studies regard the area for the identification of weathering and erosion processes and geological processes that originate climbing walls, of the fractures, dykes, mineralogy and weathering processes that condition climbing.	A wide variety of plant species. Large population of vultures and other birds. Overpopulation of wild goats.	Not relevant	High aesthetic value due to the different shapes of the rocks (such as elephant, seal, helmet, skull, etc), pink coloured rock due to oxidation of biotite. The whole Pediza is a labyrinth of rocks.	Due to the high landscape value, the area receives thousands of visitors every year: climbers, trekkers, naturalists and other tourists.	By car	Climbing is possible all year except on rainy days.
GC-15	Pefalaria	Central Iberian Range (Spain)	National University of Distance Education (Spain)	<a href="mailto:manu.garcia@ccia.uned.es">manu.garcia@ccia.uned.es</a>	Sierra de Guadarrama, Madrid, Spain	3°57'77" W	40°50'23" N	Spanish Central Range	Gneisses and other metamorphic rocks	Glacial morphology. Vertical walls, lakes, moraines, scree, peatland, etc.	No	None	Sierra de Guadarrama National Park	None	Many researches concern glacial morphology, different metamorphic rocks and alteration processes in high mountains	High variety of high mountain flora and amphibians. Protected peat bogs. Wild goats, vultures and other birds.	Not relevant	High aesthetic value as a high mountain landscape. Dark-coloured vertical walls due to the presence of lichens. Very well protected green meadows and peatlands. Beautiful lakes.	Every year the area receives thousands of visitors: trekkers, naturalists, rock climbers, ice climbers, mountain skiers and other tourists.	By car and bus (preferred by car)	Open all year. Best time for rock climbing: May-November. For ice climbing: January-February.
GC-16	Kramnica Rock	Pleniny Klippen Belt (Poland)	University of the National Education Commission, Krakow (Poland)	<a href="mailto:anna.chyrobak-aufrowska@up.krakow.pl">anna.chyrobak-aufrowska@up.krakow.pl</a>	Krompachy village, Nowy Targ commune, Lesser Poland Voivodeship, Poland	20°07'49.96" E	49°25'43.24" N	Pleniny Klippen Belt	Jurassic white and pink crinoid limestones, red limestones, also with shells	The rock outlier, together with the neighboring Orlazowa rock, forms the gorge of the Bialka River	No	None	Bialka Gorge Nature Reserve	None	The greatest scientific value is the presence of shell limestone with a large number of invertebrate fauna living in the Jurassic Sea: ammonites, belemnites or brachiopods	As part of the Natura reserve, Skalica Kramnica has high ecological values, mainly related to glacial erosion.	Not relevant	The culmination of Kramnica Rock, despite the presence of a spruce forest, is a good viewpoint. In the foreground it can be seen the the Bialka valley riverbed with its mouth section to the Dunajec River and the flat bottom of the Nowotarska Basin formed in the Frydman tectonic ditch.	A place visited only by local people, rarely by tourists.	By car	Open all year. Best time for rock climbing: May-November
GC-17	Drevenik travertine hill	Central Carpathians (Slovakia)	University of the National Education Commission, Krakow (Poland)	<a href="mailto:anna.chyrobak-aufrowska@up.krakow.pl">anna.chyrobak-aufrowska@up.krakow.pl</a>	Zehra village, Spišská Nová Ves commune, Košický kraj, Slovakia	20°46'30.26" E	48°59'17.20" N	Central Carpathians Paleogene	Pliocene-Pleistocene travertines	A plateau with a dozen travertine outliers on the top.	Geosite in the national list	None	Travertiny prí Spišskom Podhradí Natural Reserve	Spíš Castle	A rare element of the relief of travertine domes that can be observed here due to its size and long erosion time. There are numerous rock formations in the upper part in the form of columns and spiers. The travertines that build this hill are white and contain numerous plant debris.	There is rich and diverse plant life on Drevenik hill. 60 species are included in the list of threatened plants of the Slovak Republic. Contrasting mix (mountain and	The Spíš castle - the biggest castle in the middle Europe which has been inscribed on the UNESCO World Heritage List	High aesthetic values due to the variety of relief forms that can be observed on the travertine dome. The highest rock outliers of the dome are also very good vantage points for observing the area of Hornádska Kôfina Basin.	Unlike the adjacent travertine dome on which the Spíš Castle is located, Drevenik is visited by a small number of tourists each year.	By car and on foot	Open all year. Best time for rock climbing: May-November
GC-18	Mnich	Tatra Mountains (Poland)	University of the National Education Commission, Krakow (Poland)	<a href="mailto:anna.chyrobak-aufrowska@up.krakow.pl">anna.chyrobak-aufrowska@up.krakow.pl</a>	Bukowina Tatrzańska village, Bukowina Tatrzańska commune, Lesser Poland Voivodeship, Poland	20°03'18" E	49°11'33" N	High Tatras	Carboniferous granitoids with pink potassium feldspar crystals	Peak	No	None	Tatra National Park	None	Very large and well-crystallized minerals visible on the wall	Only typical mosses and lichens found on granite rocks, such as a Rhizocarpon geographicum	The peak is related to the history of Polish mountaineering, it was here that the first climbing routes in the 19th century were marked out.	The summit is a very good viewpoint on the landscape of the Bialka valley, the largest post-glacial valley in the Tatra Mountains with the largest moraine lakes.	It is one of the most frequented places by mountaineers, thousands of people are climbing there every year.	Several hours of trekking to get from the parking lot to the wall	Open all year. Best time for rock climbing: June-November. For ice climbing: December-April.
GC-19	Mieczy Szary rock formation	Tatra Mountains (Poland)	University of the National Education Commission, Krakow (Poland)	<a href="mailto:anna.chyrobak-aufrowska@up.krakow.pl">anna.chyrobak-aufrowska@up.krakow.pl</a>	Witów village, Kościelisko commune, Lesser Poland Voivodeship, Poland	19°50'58.70" E	49°16'30.03" N	Western Tatras	Organodetic limestones with nummulites, age	Structural narrowing of the river valley	Geosite in the national list	None	Tatra National Park	None	Many shell limestone with a large number of fauna living in the Eocene Sea, especially Numulites	Unique rock vegetation, e.g. Leontopodium nivale	Not relevant	At the moment, the aesthetic values of this place are low due to the ongoing forestry work	A place known only by local climbers.	By car	Open all year. Best time for rock climbing: May-November.
GC-20	Sab Bani Khams	Al Hajar Mountains (Oman)	Earth Sciences Consultancy Centre (Oman)	<a href="mailto:mekindi@gmail.com">mekindi@gmail.com</a>	Al Hamra, Jebel Shams, Northern Oman	57°12'30.72" E	23°13'9.78" N	The dome of Western Al Hajar Mountains and Cretaceous Carbonate Platform	Clear and marly Cretaceous carbonates	Vertical cliff with differential erosion	No	None	Jebel Shams	None	The area offers a great exposure of the carbonate platform that produce hydrocarbon from the Arabian Gulf, with their associated faults & fractures	Not relevant	The climbing and trekking routes in Sab Bani Khams pass through ancient settlements, which have been partly used recently.	The area offers an enchanting view of steep cliff, that are more than 1.2 km deep.	The area is heavily visited by tourists, and there are a number of resorts near the climbing and trekking routes.	By car (not by bus)	Open through the year
GC-21	Tall Balla	Deccan Volcanic Province (India)	Savitribai Phule Pune University (India)	<a href="mailto:andongrey@gmail.com">andongrey@gmail.com</a>	Tall Balla, Lonavala, Pune, India	73°20'02.94" E	18°33'50.93" N	Deccan Trap Volcanic Province	Basaltic lava flows	Vertical cliff and different lava flows	No	None	None	None	Number of basaltic lava flows, their volcanic features and morphology can be studied, as well as the stratigraphy of Deccan volcanic province	Not relevant	Known for historic forts and caves.	Natural volcanic landscape	Well known location for climbers and near to tourist attraction of Lonavala	30 mins walk from the parking place nearest village	Throughout the year except heavy monsoon days during June to September
GC-22	The Organ Pipes	Jurassic dolerite (Australia)	University of Tasmania (Australia)	<a href="mailto:mark.williams@utas.edu.au">mark.williams@utas.edu.au</a>	Hobart, Tasmania, Australia	147°14'14.3" E	42°53'45.6" S	Jurassic Gondwana rifting and breakup	Dolerite	Columnar jointed Jurassic dolerite cliffs up to 120m high	Geosite in the national list	None	Wellington Park	None	Edge of dolerite sill related to horst and graben fault blocks. Sustained foot wedging caused mechanical erosion forming novel isolated tors (Johnstones Knob and Alberts Tomb).	Not relevant	The feature was noted by early French and English explorers, and is strongly linked to the sense of place for Hobart.	An important (high) aesthetic feature of Hobart.	Well known location for climbers and seen from most parts of Hobart.	By car and then on foot. Walking tracks from the bottom of the organ pipes	Open all year. Best time for rock climbing: Nov-April.

LEGAL CONSTRAINTS	ASSOCIATED SITES		ASSOCIATED GEOTREKKING		CLIMBING DIFFICULTY	CLIMBING AND EARTH SCIENCE RELATION	POTENTIAL NATURAL HAZARDS	VULNERABILITY	FRAGILITY OF THE SITE	PROMOTION OF THE CLIMBING SITE	RELEVANT REFERENCES FOR GEOTREKKING OR GEOSITES PROMOTION		Figure in the manuscript	DOMs - Digital Outcrop Models	
	Other sites of geological interest in the surroundings	Other sites of cultural or naturalistic interest in the surroundings	Geotrekking along which the site is located	Proposed connection with a geotrekking in GEOTREKKING sheet							Degree of difficulty of climbing activity	Relation between geofeatures and climbing activity; influence on difficult degree or geofeatures visible along the rock wall.			Any possible natural hazards affecting the site (e.g., rock fall, flood...)
Any restriction to the use of the site	Yes, several related to Alpine mountain range.	Yes, many	GT-1	GT-1	Yes, for every category of climbers: from the beginners to the more expert.	Yes, quartz lenses provide microreliefs for feet and hand, while more erodible micas layers generate holes for both hands and feet. Also vertical fractures and conglutated fractures allow the climber to find adequate holds to progress along the cliff.	Not evident	None	None	None as geotrekking site, very famous for climbing activity	<a href="https://www.visitosola.it/homepage/viv-losola/estate/arrampicata-e-bouldering/">https://www.visitosola.it/homepage/viv-losola/estate/arrampicata-e-bouldering/</a>	- Bolati et al. (2016) - <a href="https://virtualexplorer.com.au/system/files/papers/8681/assets/assessment-cliffs-equipped-climbing.pdf">https://virtualexplorer.com.au/system/files/papers/8681/assets/assessment-cliffs-equipped-climbing.pdf</a> - Bolati et al. (2016) - <a href="https://doi.org/10.3301/ROJ.2018.19">https://doi.org/10.3301/ROJ.2018.19</a>		<a href="https://youtu.be/1_BNvBBZ75A">https://youtu.be/1_BNvBBZ75A</a>	
It is located on a private terrain and a low fare has to be paid to access autonomously	Yes, several related to Alpine mountain range.	Yes, many	None	GT-2	Yes, for every category of climbers: from the beginners to the more expert.	Yes, the structural features and mineralogical elements create superficial morphologies that condition climbers' progression.	The climbing wall is monitored and water is drained. A geological report was published on potential risks at the wall.	None	None	None as geotrekking site, of local importance for climbing activity	<a href="https://www.facebook.com/ZumaskinAut/?locale=it_IT">https://www.facebook.com/ZumaskinAut/?locale=it_IT</a>	Perotti et al. (2020) - <a href="https://doi.org/10.3390/resources9060063">https://doi.org/10.3390/resources9060063</a>		<a href="https://youtu.be/p_7ZVGuwE">https://youtu.be/p_7ZVGuwE</a>	
None	Yes, several related to Alpine mountain range.	Yes, many	It is located along a hiking trail with cultural value	GT-3	Yes, for every category of climbers: from the beginners to the more expert.	Yes, the layering of minerals with different degree of susceptibility to erosion is characterized by holes useful for both hands and feet. An evident vein is present favouring a different type of climbing	Some portions of the cliff are characterized by fractured rocks that suggest to be careful in such part.	None	None	None as geotrekking site, very famous for climbing activity	<a href="https://www.visitosola.it/homepage/viv-losola/estate/arrampicata-e-bouldering/">https://www.visitosola.it/homepage/viv-losola/estate/arrampicata-e-bouldering/</a>	- Bolati et al. (2016) - <a href="https://virtualexplorer.com.au/system/files/papers/8681/assets/assessment-cliffs-equipped-climbing.pdf">https://virtualexplorer.com.au/system/files/papers/8681/assets/assessment-cliffs-equipped-climbing.pdf</a> - Perotti et al. (2020) - <a href="https://doi.org/10.3390/resources9060063">https://doi.org/10.3390/resources9060063</a>	8f	<a href="https://youtu.be/AmqH_Hp8SM">https://youtu.be/AmqH_Hp8SM</a>	
None	Yes, several, and the Lake district is the most important one.	Yes, many	None	GT-4	Yes, for every category of climbers: from the beginners to the more expert.	Yes, the climbing style along the walls is characterized by the use of rounded fractures. The progression is based on grip offered by minerals on the rock wall.	Not evident	None	Human interference is really high in the area due to cave activity and ski resort presence.	None as geotrekking site, very famous for climbing activity	<a href="https://www.visitosola.it/homepage/viv-losola/estate/arrampicata-e-bouldering/">https://www.visitosola.it/homepage/viv-losola/estate/arrampicata-e-bouldering/</a>	- Bolati et al. (2016) - <a href="https://virtualexplorer.com.au/system/files/papers/8681/assets/assessment-cliffs-equipped-climbing.pdf">https://virtualexplorer.com.au/system/files/papers/8681/assets/assessment-cliffs-equipped-climbing.pdf</a> (2020) - <a href="https://doi.org/10.3390/resources9060063">https://doi.org/10.3390/resources9060063</a>	- Perotti et al.	8b	<a href="https://youtu.be/20U_1H3EX9M">https://youtu.be/20U_1H3EX9M</a>
It is inserted a Natural Area with its own legislation. Between June and September there is a shuttle to enter the area.	Yes, many	Yes, many	GT-5	GT-5	Yes, for every category of climbers: from the beginners to the more expert.	Yes, the presence of pockets and ledges support the climbing of these vertical and pendant rocks.	Rockfalls along the road to access the site.	None	None	None as geotrekking site, of local importance for climbing activity	<a href="http://www.arrampicareinvallesia.it/">http://www.arrampicareinvallesia.it/</a>	Perotti et al. (2020) - <a href="https://doi.org/10.3390/resources9060063">https://doi.org/10.3390/resources9060063</a>	Viani et al. (2018)		
None	None	None	None	None	Yes, for every category of climbers: from the beginners to the more expert.	Yes, the rock is an excellent rough and highly worked gneiss, with notches, holes and fissures that help the climbing of these technical walls and overhangs.	Not evident	None	None	None as geotrekking site, very famous for climbing activity	<a href="http://www.arrampicareinvallesia.it/">http://www.arrampicareinvallesia.it/</a>	Perotti et al. (2020) - <a href="https://doi.org/10.3390/resources9060063">https://doi.org/10.3390/resources9060063</a>			
None	Yes	None	None	None	Multi pitch routes, for expert climbers	Yes, the normal route follows the weakest points of the wall and is a succession of traverses on slabs, blades, cracks. The most famous passage is a blade named "the leaf" because of its typical shape.	Not evident	None	None	None as geotrekking site, very famous for climbing activity	<a href="http://www.arrampicareinvallesia.it/">http://www.arrampicareinvallesia.it/</a>	Perotti et al. (2020) - <a href="https://doi.org/10.3390/resources9060063">https://doi.org/10.3390/resources9060063</a>	8d	<a href="https://youtu.be/vN8wTy7L">https://youtu.be/vN8wTy7L</a>	
It is inserted a Natural Area with its own legislation.	Yes, many	Yes, many	None	None	More suitable for expert climbers	Yes, the limestone cliff is characterized by niches used by the climbers for progressing the routes.	Not evident	None	None	None as geotrekking site, very famous for climbing activity	<a href="http://www.arrampicareinvallesia.it/">http://www.arrampicareinvallesia.it/</a>	Perotti et al. (2020) - <a href="https://doi.org/10.3390/resources9060063">https://doi.org/10.3390/resources9060063</a>			
None	None	Yes	None	None	Yes, for every category of climbers: from the beginners to the more expert.	The portofid is extremely rough but not very adherent.	Not evident	None	None	None as geotrekking site, of local importance for climbing activity	<a href="http://www.arrampicareinvallesia.it/">http://www.arrampicareinvallesia.it/</a>	Perotti et al. (2020) - <a href="https://doi.org/10.3390/resources9060063">https://doi.org/10.3390/resources9060063</a>			
None	Yes, the most important is the Ivesa Moranic Amphitheatre	Yes, many	None	GT-6	Yes, for every category of climbers: from the beginners to the more expert.	Yes, the mineral and their structures influence strictly the climbing.	Rock falls in the upper sectors could occur seen the blocks and the fractures, but the wall looks like to be periodically checked.	None	None	None as geotrekking site, very famous for climbing activity	<a href="https://www.monstrutto.it/ta-falesia/">https://www.monstrutto.it/ta-falesia/</a>	- Bolati et al. (2013) - Bolati et al. (2014) - <a href="https://doi.org/10.3301/IJG.2013.24">https://doi.org/10.3301/IJG.2013.24</a>			
None	Yes, several related to Alpine mountain range.	Yes, many	None	GT-7	Yes, for every category of climbers: from the beginners to the more expert.	Yes, the layering of minerals with different degree of susceptibility to erosion is characterized by holes useful for both hands and feet. The upper sector characterized by gneiss is featured by more difficult degree due to smoother surfaces and vertical walls.	Rock falls in the upper sectors could occur seen the blocks and the fractures but the wall looks like to be periodically checked.	None	None	None as geotrekking site, very famous for climbing activity	<a href="http://www.valchavenna.com/rapport-e-attivitaa/arrampicare-in-valchavenna.html?sa=FE%20Diposabile%20arrampicare%20sala%20primavera%20fall%20autunno&amp;start=Raggiungibile%20da%20Gordona%20in%20boccards%20la_dell%20trekking%20e%20del%20camping">http://www.valchavenna.com/rapport-e-attivitaa/arrampicare-in-valchavenna.html?sa=FE%20Diposabile%20arrampicare%20sala%20primavera%20fall%20autunno&amp;start=Raggiungibile%20da%20Gordona%20in%20boccards%20la_dell%20trekking%20e%20del%20camping</a>				
Constrains on its use are imposed by its location within a Wild Life Reserve.	Yes, a carstic spring, a gorge and a larger plateau	Yes, many	None	None	Mainly for beginners and slightly experienced.	Yes, because the cliffs are formed by karstic erosion and the collapse of a cave.	Only potential hazard maybe due to small rock falls, due to goats activity.	None	None	Yes it is promoted by Palorita UGGp both as geosite and also as climbing site.	<a href="http://www.climbcrete.com/en/Climbing/Various/Voulimeno_Aloni">http://www.climbcrete.com/en/Climbing/Various/Voulimeno_Aloni</a>	- Fassoulas et al. (2007) - Fassoulas et al. (2012) - <a href="https://doi.org/10.1007/s12371-011-0046-9">https://doi.org/10.1007/s12371-011-0046-9</a>	7f		
Constrains on its use are imposed by its location within a Nature 2000 and forest area.	Yes, rappe contact, field and fossil sites	Yes	Yes	GT-11	Mainly for beginners and slightly experienced.	Yes as cliffs are formed by karstic weathering, where as folds, nappe contact and fossils can be found around.	Only potential hazard maybe due to small rock falls, due to goats activity and also under heavy rain.	It is better not to use trail during rain falls	None	Yes it is promoted by Palorita UGGp both as geosite and also as climbing site.	<a href="https://www.vrahomania.gr/plakias/">https://www.vrahomania.gr/plakias/</a>	- Fassoulas et al. (2007)			
It is a National Park with its own legislation. Between June and October there are timetables for entry and exit by car.	Yes, many	Yes, many	None	GT-14	Yes, for every category of climbers: from the beginners to the more expert.	Yes, grip climbing depends on the micro-relief of the rock, which is related to alteration processes. Fractures, dykes and mineralogy also influence the difficulty of climbing routes.	Yes, rock slides.	Typical knowledge that every climber should have before going to the mountains.	Great erosion due to overgrazing by wild goats.	La Pedrita is the main climbing school in the Community of Madrid. Many climbing courses are done there.	- de Pedraza et al. (2014) <a href="https://doi.org/10.1007/978-94-017-8628-7_5">https://doi.org/10.1007/978-94-017-8628-7_5</a> Escalante (2017) <a href="https://doi.org/10.1007/s12371-016-0187-y">https://doi.org/10.1007/s12371-016-0187-y</a> García – Rodríguez (2019)	- García-Rodríguez & Fernández-	6e	<a href="https://im.3dscannerapp.com/m?id=Hx4Mr">https://im.3dscannerapp.com/m?id=Hx4Mr</a> <a href="https://im.3dscannerapp.com/m?id=GZw79Nt">https://im.3dscannerapp.com/m?id=GZw79Nt</a> <a href="https://im.3dscannerapp.com/m?id=Z79Q3Fn">https://im.3dscannerapp.com/m?id=Z79Q3Fn</a> <a href="https://im.3dscannerapp.com/m?id=8BoTg2u">https://im.3dscannerapp.com/m?id=8BoTg2u</a>	
It is a National Park with its own legislation. Groups with more than 10 people must request a authorization to visit the area.	Yes, many	Yes, many	None	GT-15	Yes, for every category of climbers: from the beginners to the more expert.	Yes, climbing in gneisses depends on mineralogy, phenocrystal size and foliation type. Fractures, dykes and the presence of lichens also influence the difficulty of climbing routes.	Yes, snow avalanches in winter and spring.	Typical knowledge that every climber should have before going to the mountains.	Yes, it is promoted like National Park and also as climbing field.				8e		
None	Yes, many	Yes, many	None	None	Yes, for every category of climbers: from the beginners to the more expert.	Yes, climbing in shell limestone allows you to observe different fossils.	Not evident	None	None	None		- Birkenmejer (1979) - Chrobak & Bak (2019)			
None	Yes, many	Yes, many	Yes	GT-23	Yes, for every category of climbers: from the beginners to the more expert.	There is a high relation due to the possibility of observing different types of travertines depending on the chemical composition of the water from which the lime travertine precipitated and the possibility of observing the imprints of various types of plants that occurred in this area at the turn of the Pliocene and Pleistocene.	Yes, rock falls	None	Currently, they are destroyed by weathering and form various shapes.	None		- Némec (1944) - Wróblewski et al. (2010) - Nemčok (1982) - Gradinski et al. (2014) <a href="https://doi.org/10.1111/sed.12086">https://doi.org/10.1111/sed.12086</a> - Chrobak & Bak (2019)			
It is a National Park with its own legislation. All climbing should be reported to the shelter.	Yes, many	Yes, many	Yes	GT-25	Yes, for every category of climbers: from the beginners to the more expert.	Yes, climbing granite massif allows you to observe different kind of minerals.	Yes, rock falls	Typical knowledge that every climber should have before going to the mountains.	None	None		- Gawęda (2007) Zasadni & Klapyska (2014) - <a href="https://doi.org/10.1080/17445647.2014.885854">https://doi.org/10.1080/17445647.2014.885854</a>			
None	Yes, many	Yes, many	None	None	Yes, for every category of climbers: from the beginners to the more expert.	Yes, climbing in shell limestone allows you to observe different fossils.	Yes, rock falls	None	None	None		- Roniewicz (1969) Tomaszczuk et al. (2009)			
The area is fully accessible, but the mountain summit (Jebel Shams, 6 km away) is not accessible by tourists.	Yes, many	Yes, many	Sab Bani Khamis	GT-27	Yes, for every category of climbers: from the beginners to the more expert.	Yes, the competent steep cliff of the clean carbonate require the use of climbing gear, whereas the marly incompetent units form walkable slopes.	Not evident	None	None	None for geotrekking, very famous for climbing activity		- Al Kindi et al. (2022)			
None	Yes	Yes	None	None	Yes, for every category of climbers: from the beginners to the more expert.	Yes, basalt flow layers, vesicular structure, joints and erosional features help climbers to progress along the cliff.	Infrequent rock fall	Yes	None	None for geotrekking, well-known for climbing activities			6a		
None	Yes, many	Yes, many	Yes	None	More suitable for expert climbers. Some moderate routes for slightly experienced climbers.	Yes, columnar jointing provides many cracks for climbing. Coarse crystals provide textured climbing/slab. Isolated columns due to mechanical erosion provide novel climbing experiences.	Yes, but rare	Yes, most routes are traditional so knowledge of gear placement and anchors is critical.	Aesthetic integrity may be threatened by a proposed development through concealment. Commercial and industrial scale ground disturbance could induce structural damage such as rockfall.	Promoted in climbing guides and online guides.	<a href="http://thesarvo.com/confluence/display/thesarvo/The+Organ+Pipes">http://thesarvo.com/confluence/display/thesarvo/The+Organ+Pipes</a>	- Williams & McHenry (2021) - <a href="https://doi.org/10.1016/j.igscop.2021.05.001">https://doi.org/10.1016/j.igscop.2021.05.001</a> - Bradbury, J. (1995)	6d	<a href="https://sketchfab.com/3d-models/organ-pipes-519c7a5e954c7c8b9a969a75e8e20c">https://sketchfab.com/3d-models/organ-pipes-519c7a5e954c7c8b9a969a75e8e20c</a>	



