SESIA - VAL GRANDE GEOPARK

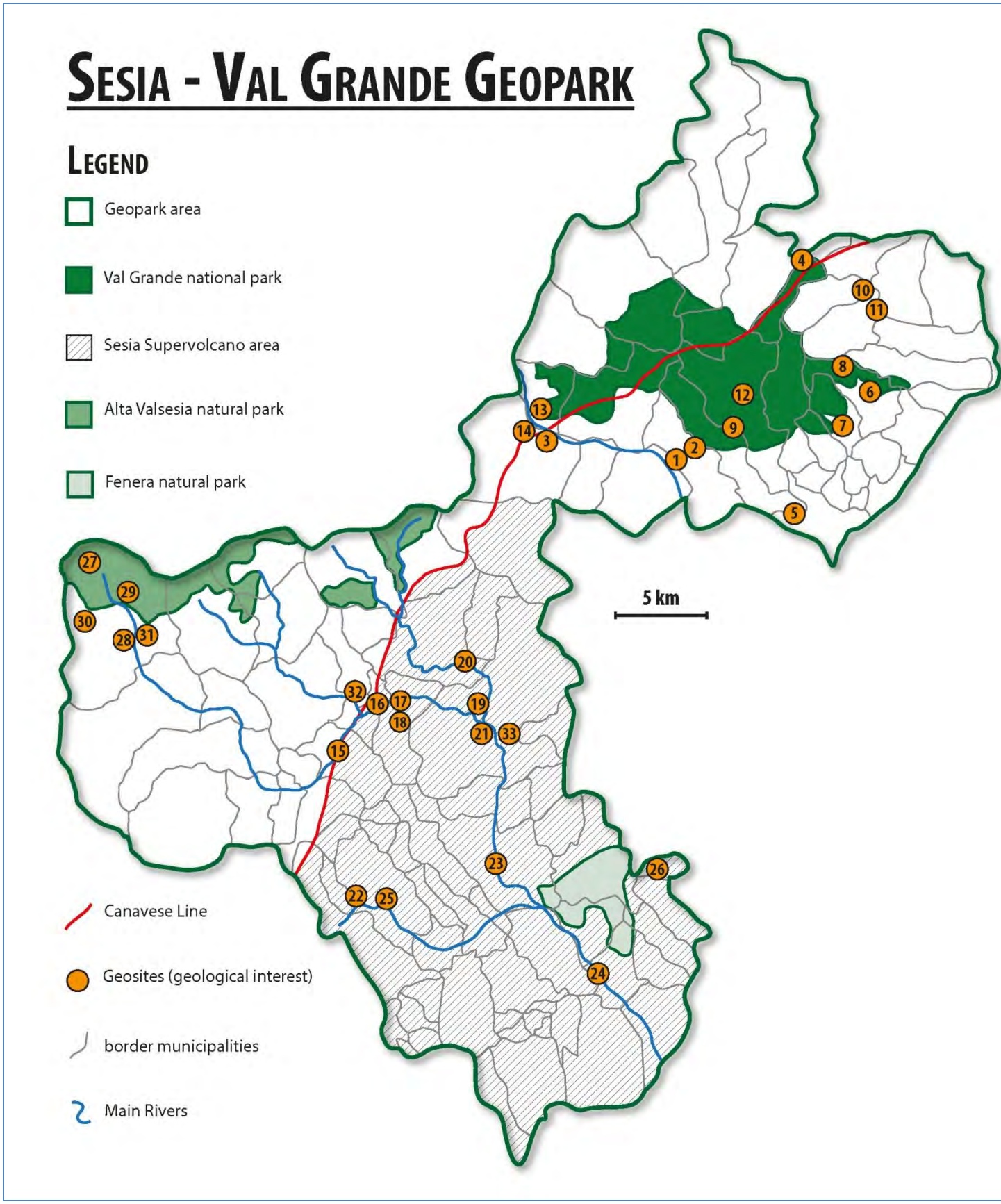
Annex 6

List and detailed description of existing geosites

Existing geological sites

I= international value; N= national value; R= regional value

1. CHURCH OF ALBO (I): One of the main units of the Ivrea-Verbano Zone
2. CANDOGLIA (I): quarries of the pink marble of the Cathedral of Milano
3. PREMOSELLO (I): contact between continental mantle and lower continental crust
4. FINERO (I): one of the most studied mafic - ultramafic body of the world
5. BED OF THE SAN BERNARDINO RIVER (N): Scisti dei Laghi, an important Italian metamorphic unit
6. CADORNA ROAD: PIAN D'ARLA – OSPEDALETTO (I): the Leptynite – Amphibolite Group is very widespread in the European Hercynian belts
7. PONTE NIVIA (I): the Leptynite – Amphibolite Group is very widespread in the European Hercynian belts
8. CADORNA ROAD: P. FOLUNGO - MT. BAVARIONE (I): this is a complete section of the Strona-Ceneri Zone, a unit that has been investigated by many European scientists
9. PONTE CASLETTO (I): Cenerigneisses are a good example of metasediments with very complex evolution
10. SPOCCIA – ORASSO (I): the relations between the CMB line and the mafic Intrusion; the Appinite suite may be compared with similar rocks in Scotland.
11. ROAD PONTE SPOCCIA – SPOCCIA (I): the relations between the CMB line and the mafic Intrusion; the Appinite suite may be compared with similar rocks in Scotland.
12. POGALLO VALLEY (I): the Pogallo line
13. CASTLE OF VOGOGNA (I): mylonites of the Insubric (Canavese) line
14. PREMOSELLO – VOGOGNA (I): "fossil earthquakes
15. SCOPETTA - old bridge over the Sesia river (I): Mylonite of the Insubric Line.
16. BALMUCCIA (I): one of the best preserved mantle peridotites in the world.
17. VOCCA Near the village of Isola(I): High-temperature deformation of gabbro.
18. VOCCA near the bridge on the Gavala stream(I): Crustal rocks incorporated in the Mafic Complex.
19. ANICETI – VARALLO (I): The upper Mafic Complex where igneous structures are best preserved.
20. BOCCIOLARO (I): mingled diorite and mafic enclaves crops transition between main gabbro and Diorites.
21. CREVOLA-VARALLO (I): Mafic Complex – Kinzigite Formation contact.
22. VALSESSERA- LA FRERA (R): synmagmatic normal faults cross-cutting recrystallized and foliated gabbro.
23. Under the bridge of AGNONA (I): Mingling of mafic and acidic rocks boundary of lower and upper crust.
24. PRATO SESIA (I): Caldera Megabreccia.
25. PIANCONE(I): paragneiss layers, with norites, quartz-norites, charnockites and restitic paragneiss septa.
26. GARGALLO (I): caldera fill and caldera wall.
27. MONTE ROSA massif and its glaciers (N): granitic massif, glaciers and related landforms.
28. MONTE ROSA GOLD MINES (I): gold veins and ancient mining structures.
29. STOFFUL (R): talc-bearing serpentinites "pietra ollare".
30. CIMALEGNA (N): high mountain geological-pedological track.
31. WOLD – FUN D'EKKU (R): glaciological track.
32. BOCCIOLETO (R): peculiar landform and genesis of the Giavine rock Tower.
33. UNIPIANO(R): Varallo: paleo-valleybottom during the last glaciation.



Locations of the following geosites

1) CHURCH OF ALBO
Italy, Piemonte Region, Province of Verbania, Municipality Mergozzo
Geo Coordinates: 45°58'43.68"N 8°25'09.62"E; altitude: 231 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig. 1a

Fig. 1b

Description
This beautiful outcrop (Fig.1a) consists of dark, biotite rich schists, known in the Italian geologic literature as "kinzigites", belonging to the Ivrea-Verbano Zone (or "Formazione dioritico-kinzigitica Ivrea Verbano"). It is a high-grade metamorphic rock which suffered a limited partial melting (at around 700°), producing a hydrous granitic melt. The melt recrystallized forming the evident lenses and pods of pegmatite (fig.1b), a white rock consisting mainly of quartz and feldspar with some muscovite and tourmaline; the coarse grain size is due to crystallization in the presence of water.

More details
The schistose rock consists of quartz, plagioclase, biotite, a little secondary muscovite and sillimanite; some garnet may occur. The presence of quartz rods (fig.1b) is typical of metamorphic rocks derived from clay-rich sediments.

Conservation
The site shows no conservation problem.

How to reach this site
From Verbania through Fondotoce and Mergozzo. From the Sempione Pass with the E62, exit Mergozzo. In the village of Albo, behind the church: 2 outcrops with a crucifix and a column on top.

2) CANDOGLIA
Italy, Piemonte Region, Province of Verbania, Municipality: Mergozzo
Geo Coordinates: 45°58'54.88"N 8°25'54.88"E; altitude: 577 m
Level of interest International
Scientific interest. Main: Petrography, Cultural heritage. **Secondary:** Historical
Geosite GEOLOGICAL AND HISTORICAL

Fig.2a

Fig.2b

Description
Quarries (fig.2a) of the pink marble of the cathedral of Milan (Duomo di Milano). This is a high grade metamorphic marble (fig.2b), unfortunately rather impure; besides calcite, there are many silicates and sulfides, like pyrite which oxidizes to limonite on exposure, causing rust-coloured spots. As a consequence only a small part of the quarried marble can be used as a facing stone for the cathedral. The pink marble represents several thin intercalations within the Kinzigites of the Ivrea-Verbano Zone. The lenses are folded and discontinuous; their thickness varies from a meter to tens of meters.

More details
The main quarry "Cava Madre" is underground; other active or abandoned quarries can be reached through a very steep road.

Conservation
The quarries are property of the Fabbriceria del Duomo. Visitors must ask permission to the direction of the Fabbriceria and should be accompanied by the personnel of the quarries.

How to reach this site
From Verbania through Fondotoce and Mergozzo. From the Sempione Pass with the E62, exit Mergozzo.

3) PREMOSELLO
Italy, Piemonte Region, Province of Verbania, Municipality Premosello Chiovenda
Geo Coordinates: 46°00'19.39"N 8°19'17.37"E; altitude: 238 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology.
Others: Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig.3

Description
This extraordinary outcrop (Fig.3) shows the contact between peridotites of the lithospheric mantle and mafic granulites of the lower continental crust, brought to the surface from a depth of 30 - 35 km by tectonic and erosional processes. The lower part of the rock wall consists of a black, homogeneous serpentinized peridotite (a transformation that implies metamorphism and hydration of the original rock). The upper part of the outcrop is a mafic granulite, probably derived from a layered gabbro. The contact is a surface dipping 35° towards N.

More details
This surface may be considered as representing the Mohorovicic discontinuity (or simply *Moho)*, i.e, the crust / mantle contact.

Conservation
The site shows no conservation problem.

How to reach this site
Along a road at the foot of the mountain side in the western part of Premosello. The road runs along a dark wall of rock from which is separated by a railing.

4) FINERO
Italy, Piemonte Region, Province of Verbania, Municipality: Malesco
Geo Coordinates: 46°06'31.18"N 8°33'12.47"E; altitude: 1002 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology.
Others: Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement


Fig.4

Peridotite quarry (Fig.4). It is part of the world - famous Finero mafic-ultramafic complex. This unit lies at the northern tip of the Ivrea-Verbano Zone; it consists of a peridotitic slice, enveloped into an intrusive magmatic sequence of mafic and ultramafic rocks. In the quarry the main peridotite is a harzburgite (olivine + orthopyroxene), sometimes grading into a dunite with chromitite layers, hosting platinum group elements (PGE) mineralizations. Thin dykes of pyroxenite sharply cut the peridotite. The peridotite sometimes contains hydrated minerals (pargasitic to edenitic amphibole and phlogopite) and is anomalously enriched in minor and trace incompatible elements. Such features testify a later re-fertilization of a primary restitic mantle.

More details
The mafic rocks enveloping the peridotite, with coarse grained pyroxenes and garnet crystals up to several cm in diametre, may be observed along the footpath from Ponte Creves to Provola, after the bridge "Ponte Provola" (46°06'14.86"N 8°32'42.15"E; a. 812m).

Conservation
The site shows no conservation problem.

How to reach this site
The peridotite quarry is reached by a private road starting near Ponte Creves, about 1 km from Finero.

5) BED OF THE SAN BERNARDINO RIVER
Italy, Piemonte Region, Province of Verbania, Municipality San Bernardino Verbano
Geo Coordinates: 45° 57' 22.52" N 8° 31' 36.14" E; altitude: 248 m
Level of interest National
Scientific interest. Main: Geology of the basement, Metamorphic petrology, Glacial Morphology**.**
Secondary: Structural Geology**. Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig.5a

Fig.5b

Description
Large reef with exposed the "Scisti dei Laghi", a geological unit mainly consisting of micaschists derived from amphibolite-facies regional metamorphism (500 - 600 °C) of marine shales of likely Cambrian age. This metamorphism, connected to a Carboniferous orogeny (Hercynian or Variscan Orogeny), did not completely obliterate the original sedimentary features (arenaceous layers interlayered with more clay-rich layers). The reefs show a typical round-shaped morphology, due to the glacial abrasion (*roches moutonnées*) as well as some so-called "giant's bowls" (fig. 5a).

More details
The mineralogical composition of the rocks is dominated by quartz and micas (muscovite, biotite), with plagioclase ± garnet ± kyanite ± staurolite. The widespread white quartz rods are typical of metamorphic rocks derived from terrigenous clay-rich sediments. Multiple phases of plastic folding can be observed ("similar folds", thickened in the hinges and thinned in the flanks; fig.5b).

Conservation
In the warm season this is a very popular place for sun tanning and swimming in the small lake at foot of the reef. Unfortunately the reef is also chosen by "writers" to perform their skills. It would be useful to install placards indicating the prohibition of such acts of vandalism and indicating the sanctions for spoiling this beautiful place.

How to reach this site
For those coming from Verbania: After crossing Trobaso and after the junction of the road to Unchio, a hundred meters before the bridge over the San Bernardino river, on the left side of the road there is a small chapel with parking space. Take the small road to the bed of San Bernardino and walk westward to the reef. For those coming from Bieno, a hundred meters after the bridge over the San Bernardino stop at the small chapel on the right.

6) CADORNA ROAD: PIAN D'ARLA - MT ZEDA GROUP
Italy, Piemonte Region, Province of Verbania, Municipality Aurano
Geo Coordinates: 46°01'24.24"N 8°36'04.78"E; a. 1287 m
Level of interest Regional
Scientific interest. Main: Geomorphology. **Secondary:** Geology of the basement, Petrography.
Others: Naturalistic, science education, environmental
Geosite GEOLOGICAL LANDSCAPE - Geology of the basement

Fig.6

Description
From Pian d'Arla, along the Cadorna road (southern tip of the road surrounding Mt Spalavera), we can have a comprehensive view (Fig.6) of the Mt Zeda group and of the Scisti dei Laghi that are exposed on the footpath toward the SW ridge. The morphology of the Mt Zeda group reflects both the lithology and the Quaternary evolution: the alternating orthogneisses and paragneisses correspond respectively to the peaks and to the saddles. Above the altitude of Mt Spalavera (the maximum elevation reached by the Lago Maggiore glacier) we see a rugged morphology due to the peri-glacial erosion dominated by crioclastic action. Below that altitude we can see a smooth morphology modelled by the abrasion of the glacier, or preserved pre-glacial weathering products on the slopes facing SW, which were protected from the ice.

More details
Looking backward, towards the lake, the typical morphology of the Scisti dei Laghi area consists of rounded mountains with rare rock walls corresponding to orthogneiss intercalations and deep saddles corresponding to the schists.

Conservation
The site shows no conservation problem.

How to reach this site
"Cadorna Road" (old military road): from Verbania through Premeno, Pian di Sole, Pian Cavallone, Colle, Pian d'Arla.

7) PONTE NIVIA
550 - 340 million years
Italy, Piemonte Region, Province of Verbania, Municipality Intragna
Geo Coordinates: 45° 59' 22.77" N 8° 34' 08.33" E; altitude: 474 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural Geology.
Others: Naturalistic, science education, environmental, archaeological.
Geosite GEOLOGICAL - Geology of the basement

Fig.7a

Fig.7b

Description
Banded amphibolites of the SCBZ (Strona-Ceneri Border Zone; Fig.7a). This unit mostly consists of amphibolite facies rocks derived from pyroclastic basaltic rocks of pre-Cambrian age (555 million year old). Around 470 million years ago, acidic magmatic residua, coming from granitic intrusions, invaded the permeable pyroclastites, expecially the coarser-grained ones. The following amphibolite facies metamorphism connected with a Carboniferous orogeny (Hercynian or Variscan orogeny) did not obliterate the structures originated during those events (feldspar megacrysts in the coarsest parts; Fig.7b). Walking downstream the Nivia creek from the antique bow bridge we can observe each stage of the "feldspathization" of the amphibolites.

More details
The main mineralogical composition of these rocks is hornblende + plagioclase; in the "feldspathized" levels also K-feldspar, quartz and biotite in variable amounts.

Conservation
The site is only frequented by fishermen, therefore there is no conservation problem. The antique bow bridge of roman type is a remarkable work, now completely abandoned. It would be interesting to reconstruct its age and history.

How to reach this site
From Verbania towards Cambiasca and Ramello: just after Ponte Nivia take the road to Intragna till the beginning of the hairpin bends, where there is space for parking. A small path on the left leads to the bow bridge and along the bed of the creek.

8) **CADORNA ROAD: STRONA - CENERI ZONE AT MT. BAVARIONE**
Italy, Piemonte Region, Province of Verbania, Municipality Aurano
Geo Coordinates: from: 46° 02'26.78" 8°34'58.31"; altitude: 1357 m
to: 46° 02' 04.72" N 8° 35' 05.87" E; a. 1316 m
Level of interest International
Scientific interest. Main: Geology of the basement, Structural Geology. **Secondary:** Petrography, Geomorphology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig. 8a

Description
Walking along the road (prohibited to private cars) surrounding Mt Bavarione from Passo Folungo, we can observe an almost continuous exposure of all the rock types of the Strona - Ceneri Zone (fig.8a).
The first outcrop consists of flaser gneiss, a strongly laminated augengneiss (fig.8b). Then for a long stretch we find the "Gneiss Minuti", fine-grained gneisses with beautiful similar folds and calc-silicate nodules (fig.8c).

Fig.8b

Fig.8c

Before reaching the southern tip of the road, we meet an orthogneiss interlayered to the “Gneiss Minuti”(Fig.8d). In last tens of meters, the outcrops almost disappear because the rocks preserve a pre-glacial weathering cover, which turns the quartz - feldspatic rocks into a coarse residual sand. A non weathered mafic dyke cuts across the rocks; its intrusion is certainly later than the metamorphism, and therefore most probably of Permian age (around 270 million years). The dyke cuts across the contact between the Orthogneiss and the Ceneri Gneiss. The latter is exposed in a few rounded blocks preserved from weathering. Some well zoned calc-silicate nodules and quartz pebbles (Fig.8e) can be observed.

Fig.8d

Fig.8e

More details

The remnants of this deep alteration of likely Pliocenic age may be seen only on the southern slopes, since they were on the lee side of the Lago Maggiore Glacier, coming from the N. On the northern slopes the arenite cover was abraded by the glacier.

Conservation

The site shows no conservation problem.

How to reach this site

“Cadorna Road” (old military road): from Verbania through Premeno, Pian di Sole, Pian Cavallone, Colle, Pian d’Arla, Pian Puzzo, Alpe Archia, Passo Folungo. Parking possible at Passo Folungo.

9) PONTE CASLETTO
Italy, Piemonte Region, Province of Verbania, Municipality San Bernardino Verbano
Geo Coordinates: 45° 59' 34.00" N 8° 29' 05.01" E; altitude: 426 m.
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural Geology.
Others: Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig.9

Description
Along the Val Grande creek, on the outcrops as well as on the large boulders carried by the water we can observe the spectacular characters of the so-called Ceneri Gneiss (from the Passo Monte Ceneri in Tessin, CH). This rock of still highly debated origin derived through the metamorphism of a sedimentary rock of presumably Cambrian age. The most reliable interpretation is that of an arenaceous - conglomeratic deposit from a submarine landslide ("turbiditic mass flow") along an active continental margin above a subduction zone. During the lithification of the sediment ("diagenesis"), carbonatic concretions were formed by Ca-rich interstitial water. The metamorphism, due to a Carboniferous orogeny (Hercynian or Variscan Orogeny), did not obliterate the structures created by these events. Pebbles of various kinds and strongly deformed calc-silicate lenses are visible in great abundance (Fig.9).

More details
The mineral association is: quartz, plagioclase, biotite, muscovite ± garnet ± sillimanite. The calc-silicate nodules are zoned with the sequence (from rim to core): biotite, hornblende, diopside, Ca-rich garnet, and sometimes calcite.

Conservation
The site is only frequented by fishermen, therefore there is no conservation problem.

How to reach this site
Provincial road from Rovegro - San Bernardino Verbano (8 km) towards Cicogna. After a tunnel there is a bridge; walk down the small stair and pass under the bridge till the Rio Valgrande bed. There is no parking possibility near the bridge, so cars must be left far before the bridge or in Cicogna.

10) SPOCCIA
Italy, Piemonte Region, Province of Verbania, Municipality: Cavaglio Spoccia
Geo Coordinates: 46°06'00.97"N 8°36'18.93"E; a. 896 m
Level of interest International
Scientific interest. Main: Structural geology, Permian magmatic activity, Petrography.
Secondary: Geology of the basement, **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig.10

Description
Mylonites of the CMB Line with Appinitic dykes. In the bed of the Orasso creek the subvertical schistose rocks belonging to the thick shear belt of the CMB Line, are intruded by thin mafic dykes. The dykes are mostly concordant with the foliation, but some of the tiny dykes are intruded at 45° from the foliation.

More details
The attitude of the dykes demonstrates that the CMB line was already vertical at the moment of their intrusion and that a dextral shear strain was active along the fault zone. This contradicts the hypothesis of tilting from subhorizontal to the present position of the entire sequence Ivrea Verbano - Serie dei Laghi during the Alpine orogeny, proposed by some authors.

Conservation
The site shows no conservation problem.

How to reach this site
Upper Spoccia – Orasso footpath, crossing the Orasso creek, above the small water fall.

11) SPOCCIA
Italy, Piemonte Region, Province of Verbania, Municipality Spoccia
Geo Coordinates: 46°05'22.94"N 8°35'40.98"E; a.522 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology.
Others: Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Description
This almost continuous outcrop shows schists and paragneisses with a subvertical foliation, intruded by concordant Permian mafic dykes, called "Appinites" after the Appin County in Scotland where similar rocks occur (although of different age). The dykes show decreasing grain size towards the country rocks (so called *chilled margins*), indicating that they were intruded after the metamorphism, when the schists were cold enough to induce rapid cooling of the magma near the contacts. The typical appinite consists of plagioclase and hornblende, the latter often with inclusion of biotite. Here their grain size is fine, but further east, towards Lago Maggiore, the appinites may be coarse grained and are often accompanied by acidic rocks (products of magmatic differentiation).

More details
The appinites are intruded along the CMB Line, the main tectonic separation between the Ivrea-Verbano Zone and the Serie dei Laghi. The CMB Line is a thick shear zone mostly consisting of strongly deformed Serie dei Laghi rocks and sometimes recrystallized mylonites with lower pressure high temperature final imprint due to the intrusion of a mafic magma.

Conservation
The site shows no conservation problem.

How to reach this site
Road Ponte Spoccia – Spoccia, after the first tunnel

12) MYLONITES OF THE "POGALLO LINE"
Italy, Piemonte Region, Province of Verbania, Municipality San Bernardino Verbano
Geo Coordinates: 46° 01' 29.24" N 8° 29' 35.27" E; altitude 789 m
Level of interest International
Scientific interest. Main: Geology of the basement, Structural Geology. **Secondary:** Petrography. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig.12

Description
The mule track along the Pogallo Valley from Cicogna shows an almost complete cross section through the Strona-Ceneri Zone, the arenaceous unit of Serie dei Laghi. In the first part we can observe the "Gneiss Minuti", metamorphic rocks derived from fine-grained sandstones, which still preserve their sedimentary bedding. Then we cross the "Ceneri-Gneiss", metamorphic rocks derived from coarse grained sandstones – conglomerates, and, near "Ponte di Calenesc", the augengneisses. After this horizon, the white walls of augengneiss disappear and the slopes acquire a smooth profile. On the track we can observe the mylonites related to the Pogallo Line (Fig.12). The mylonites are the product of the plastic deformation along a fault developed at high depth and at high temperature. They are dark rocks with an extremely fine grain-size in which are visible small white, more or less flattened lenses. These are *porphyroclasts,* i.e. crystals of minerals which continued to behave in a brittle-elastic way inside the plastic matrix.

More details
This extraordinary outcrop (first described by Boriani, 1970) represents the tectonic contact between the Ivrea-Verbano Zone, made up of rocks typical of the continental lower crust, to the NW and the Serie dei Laghi, made up of rocks typical of the upper continental crust, to the SE. This tectonic discontinuity is known as "Pogallo line". Its detection allowed to understand that the two units were not in continuity, but they had been tectonically juxtaposed. Successive studies (Boriani & Sacchi, 1973) showed that the original contact between the two units is another fault, called "CMB line" (from the initials of Cossato - Mergozzo - Brissago, were it was recognized). The Pogallo Line is younger and dislocates the CMB with a sinistral slip of around 12 km.

Conservation
The site shows no conservation problem.

How to reach this site
From Verbania with the road along the San Bernardino valley up to Cicogna, then the mule track to Pogallo.

13) CASTLE OF VOGOGNA
Italy, Piemonte Region, Province of Verbania, Municipality Vogogna
Geo Coordinates: 46°00'28.99"N 8°17'46.09"E; a.256 m
Level of interest International
Scientific interest. Main: Alpine Geology, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig.13

Description
Phyllonites of the Canavese Line. They are highly foliated rocks, greenish in colour for the presence of chlorite (Fig.13). They derive from the plastic deformation at about 450° of already metamorphic rocks. The phyllonites form a belt along the Canavese Line, which is the western part of the Insubric Line, a fault separating the Ivrea rocks with prealpine structures in the South from the Canavese Zone and the Sesia Zone (an Austroalpine unit of the Central Alps) further to the north. From S to N, the phyllonites are Ivrea-derived mylonites, mylonitized Permo-Mesozoic cover rocks (Canavese), and mylonites derived from the Sesia Zone (orthogneisses in this outcrop).

More details
The Sesia-derived mylonites accommodated a thrusting of the Central Alps over the Southern Alps (backthrusting) coupled with a minor dextral strike-slip component between 23 and 19 m.y. A correlation of the low temperature deformation with the backthrusting event is obvious, since the southern limit of the area affected by rapid cooling coincides with the Canavese phyllonite belt. The younger strike-slip event continued well into at least the Late Miocene. The vertical displacement was at least 20 km, while the horizontal offset was likely in the order of 100 km.

Conservation
The site shows no conservation problem.

How to reach this site
Castle of Vogogna, along the footpath from the castle to Genestredo.

14) BETWEEN PREMOSELLO AND VOGOGNA
Italy, Piemonte Region, Province of Verbania, Municipality :Vogogna
Geo Coordinates: 46°00'19.36"N 8°18'42.45"E; a. 230 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig.14a

Fig.14b

Description
This outcrop shows a pseudotachylite breccia (fig.14a, 14b). The "breccia" consists of fragments of mafic granulites cemented by dark veins very similar to a basaltic glass called tachylite (hence the name "pseudotachylite"). The glass is often devitrified and replaced by a fine grained ground mass. These rocks are generally found along seismogenetic faults; the heat produced by extreme friction along the fault causes instantaneous melting of the rocks and reduces the attritus, generating an earthquake. Therefore pseudotachylites are considered *fossil earthquake*s. The melt is injected in the fractures, where it solidifies very rapidly as glass.

More details
This pseudotachilite breccia is found all along the Canavese Line, a fault that separated the stronalites to the W from a mafic-ultramafic complex to the E. The earthquake that generated this pseudotachyilite was probably related to the movements of this fault around 20 million years ago.

Conservation
The site shows no conservation problem.

How to reach this site
Between Premosello and Vogogna, at the foot of the slope exactly at the municipal border between the two villages.

15) SCOPETTA - OLD BRIDGE OVER THE SESIA RIVER: MYLONITE OF THE CANAVESE LINE.
Italy, Piemonte Region, Province of Vercelli, Municipality Scopello
Geo Coordinates: 45°48'25"N 8°7'26"E; altitude: 596 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the volcanic complex
Description
beneath an old bridge over the Sesia river visitors may see the mylonites of the Insubric Line, localizing the tectonic boundary of the Ivrea-Verbano Zone. In this segment of the Valley, which turns to the South and continues on strike for about 6 km, the geomorphology is strongly controlled by the Insubric fault.
More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

16) BALMUCCIA: ONE OF THE BEST PRESERVED MANTLE PERIDOTITES IN THE WORLD
Italy, Piemonte Region, Province of Vercelli, Municipality Balmuccia
Geo Coordinates: 45°49'12.6"N 08°09 '11.5 "E; altitude: 555 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite Geological - Geology of the basement

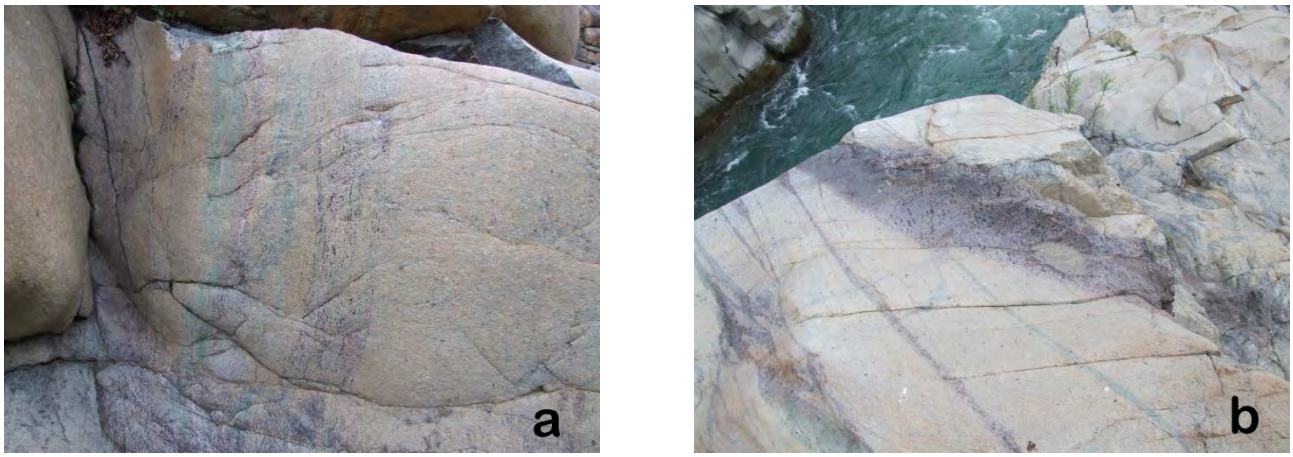


Fig 16 a,b. The Balmuccia mantle peridotite, showing Cr-diopside and Al-augite bands and dykes, deposited by old melting events.

Description
It is one of the best preserved mantle peridotites in the world (Fig. 16 a, b). Approaching the river, visitors see that the reddish rocks become more and more green. This happens because the rock is a peridotite, made mainly of olivine, a mineral that is easily altered by giving a red patina which near the river is washed away by water. Clearly evident is a network of green and gray dikes and bands (Fig. 16 a, b), which are formed of pyroxene deposited by basaltic magmas that flowed through the mantle during ancient episodes of partial melting . These rocks are studied to understand the origin and evolution of basaltic magmas produced by the mantle. Once thought to be the mantle basement above which the Mafic Complex was intruded at the crust-mantle boundary, the Balmuccia lens of mantle rocks was interfingered within the Kinzigite Formation before the Permian mafic intrusion.

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

17) VOCCA NEAR THE VILLAGE OF ISOLA: HIGH-TEMPERATURE DEFORMATION OF GABBRO.
Italy, Piemonte Region, Province of Vercelli, Municipality Vocca
Geo Coordinates: 45°49'31"N 8°09'55"E; altitude: 536 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

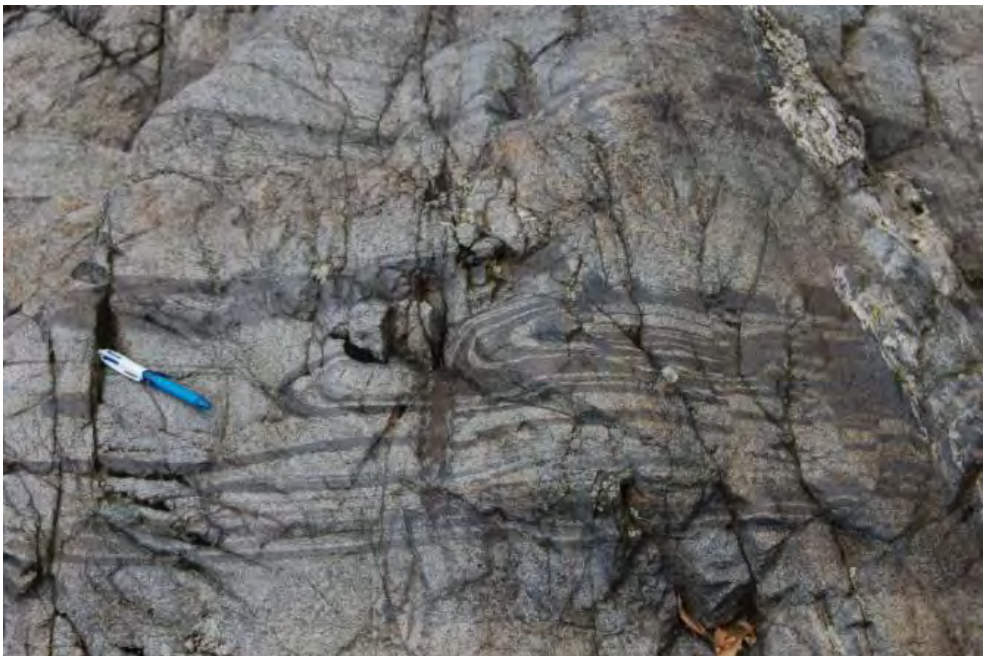


Fig 17. High temperature fold in gabbro.

Description
Near the village of Isola, a large outcrop on the river shows gabbros with advanced stretching foliation, isoclinal folds and boudinage of ultramafic cumulates, which are common at this depth in the Mafic Complex. These deformations were produced by high temperature stretching during the growth of the Mafic Complex.
More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

18) VOCCA NEAR THE BRIDGE ON THE GAVALA STREAM: CRUSTAL ROCKS INCORPORATED IN THE MAFIC COMPLEX.
Italy, Piemonte Region, Province of Vercelli, Municipality: Vocca
Geo Coordinates: 46°49'20"N 8°10'13"E; altitude 556 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology.
Others: Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig.18

Description
Under the bridge visitors see one of the various layers of paragneiss intercalated in the gabbro of the Basic Complex (Fig. 5). They are derived from ancient meta-sediments that were part of the crust and have been incorporated into the Basic Complex during its intrusion. Due to the high temperature, after being ingested in the magma they melted much more than equivalent rocks that are located at the roof of the intrusion (visible at geosite in Crevola). This has resulted in the disappearance of biotite and the abundance of garnet. These crustal levels, whose thickness is generally less than ten meters, can be followed for more than 20 km from Val Mastallone to Val Sessera. This extreme aspect ratio resulted from their stretching during the growth of the Mafic Complex.

More details
Crossing over the bridge and walking downstream for about 50 meters visitors reach the entrance of the abandoned nickel mine which was active until the Second World War. The nickel was extracted from sulfides contained in a layer of cumulus pyroxenite.
Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

19) ANICETI – VARALLO: THE UPPER MAFIC COMPLEX WHERE IGNEOUS STRUCTURES ARE BEST PRESERVED.
Italy, Piemonte Region, Province of Vercelli, Municipality Varallo
Geo Coordinates: 45°49'28"N 8°14'52"E; altitude: 476 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement The upper Mafic Complex.

Fig. 19 Enclaves

Description
At locality Aniceti visitors are in the core of the Mafic Complex, where igneous structures are best preserved. Exposed in the stream is a swarm of mafic enclaves in the "Diorites". The enclaves are fine-grained, porphyritic gabbro with plagioclase phenocrysts. (Fig 19). This is a typical magmatic texture that forms when basaltic magma (at a temperature of about 1200 ° C) intrudes a largely crystallized magma rich in silica (a "crystal mush ", in this case of dioritic composition, at a temperature of about 800 °C). The basaltic magma cools quickly and forms "pillows" which are then re-intruded by diorite. Here we are in the "magma chamber".

More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

20) BOCCIOLARO: MINGLED DIORITE AND MAFIC ENCLAVES CROPS TRANSITION BETWEEN MAIN GABBRO AND DIORITES.
Italy, Piemonte Region, Province of Vercelli, Municipality Cravagliana
Geo Coordinates: 45°51'11"N 8°14'17"E; altitude: 570 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig. 20 Stretched enclaves

Description
In the stream at locality Bocciolaro, an example of mingled diorite and mafic enclaves crops out at the transition between Main gabbro and "Diorites" (N45 51 11.6 E8 14 12.8). Compared to the previous geosite, enclaves are vey stretched (Fig. 20). This difference is due to the deeper position in the Mafic Complex, where crystallizing rocks were stretched during the growth of the Mafic Complex.

More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

21) CREVOLA-VARALLO: MAFIC COMPLEX – KINZIGITE FORMATION CONTACT.
Italy, Piemonte Region, Province of Vercelli, Municipality Varallo
Geo Coordinates: 45°48'38"N 8°15'25"E; altitude: 455 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Figure 21 Migmatites at the roof of the mafic complex

Description
At locality Crevola along the river there is one of the best exposures of the contact between Mafic Complex and the Kinzigite Formation. Visitors see how the country rocks melted, producing a granitic magma as a consequence of the heat released by the Mafic Complex. Amphibolite-facies migmatite, (Fig. 21) with chaotic deformation, is in primary contact with garnet-bearing diorite (following upstream about 200 meters).

More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

22) VALSESSERA- LA FRERA: SYNMAGMATIC NORMAL FAULTS CROSS-CUTTING RECRYSTALLIZED AND FOLIATED GABBRO.
Italy, Piemonte Region, Province of Vercelli, Municipality Trivero
Geo Coordinates: 45°41'22"N 8°7'30"E; altitude: 702 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig. 22 Small synmagmatic extensional faults filled by late-stage gabbroic melt

Description
Small synmagmatic normal faults cross-cutting recrystallized and foliated gabbro of the lower Mafic Complex and other high-temperature deformation structures produced during the growth of the Mafic Complex.
More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

23) UNDER THE BRIDGE OF AGNONA: MINGLING OF MAFIC AND ACIDIC ROCKS BOUNDARY OF LOWER AND UPPER CRUST.
Italy, Piemonte Region, Province of Vercelli, Municipality Agnona
Geo Coordinates: 45°43'25"N 8°15'44"E; altitude: 368 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Description
Under the bridge of Agnona, on a large outcrop at the river visitors can observe a magmatic mixture of gabbro – dioritic and granitic rocks that characterizes this crustal level, where magmas of basaltic and granitic composition intruded each other along the projection of the CMB Line, beneath the large pluton of Roccapietra - Valle Mosso, which grew incrementally by progressive injections of granite at a depth of few kilometers in the upper crust.

More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

24) PRATO SESIA: CALDERA MEGABRECCIA.
Italy, Piemonte Region, Province of Vercelli, Municipality Pratosesia
Geo Coordinates: 45°39'31"N 8°21'32"E; altitude 290 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig. 24a

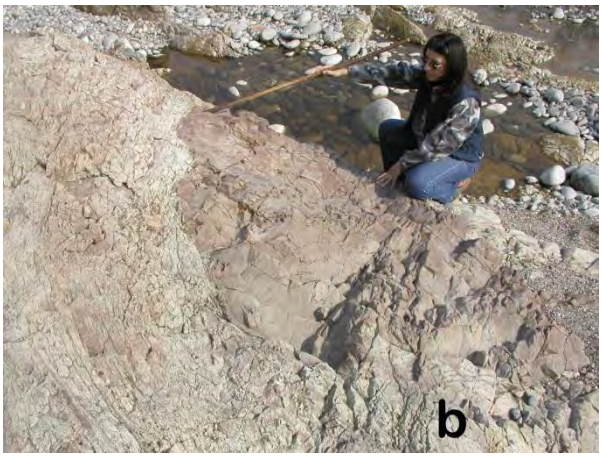


Fig. 24b

Description
This area is located within the caldera fill, and exposes one of the better outcrops of megabreccia (Fig. 11). In this spectacular outcrop, visitors may see gigantic blocks of different types of rocks, mainly derived from the pre-existing volcanic field and partially from the basement, encased in a welded tuff. This chaotic association of rocks formed during the caldera collapse, when enormous landslides filled the caldera contemporaneously to the eruption of more than 500 km3 of pyroclastic flows. These features were enigmatic for geologists that mapped the area in the past, whereas were recently understood by Quick et al., (2009) on the basis of similar characteristics in well studied North American calderas reported by Lipmann (1997)
More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

25) PIANCONE: PARAGNEISS LAYERS, WITH NORITES, QUARTZ-NORITES, CHARNOCKITES AND RESTITIC PARAGNEISS SEPTA.
Italy, Piemonte Region, Province of Vercelli, Municipality: Trivero
Geo Coordinates: 45°42'01"N 8°8'20"E; altitude: 600 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental
Geosite GEOLOGICAL - Geology of the basement

Fig. 25. Thin band of paragneiss included in gabbroic rock and cut by a late-stage melt

Description
the stream cross-cuts a belt rich in paragneiss layers, where norites, quartz-norites and charnockites are abundant and interlayered with restitic paragneiss septa and minor amphibole gabbro. At the end of the traverse is the thickest paragneiss septum, which is about 100 m across (N 45 41 59; E 8 9 03). Before arriving at this septum, smaller septa of paragneiss are included in norite and cut by small normal faults filled by fine-grained gabbro (Fig. 12). In the septum, charnockite is present either as bands or discordant dikes within a garnet-rich metasediment in which thin corundum bands may easily be found. Biotite is present, although rare. At the eastern contact of the septum, garnet-bearing norites are present. Immediately above, bands of charnockite mingled with norite are transposed into the foliation. The composition of these granitoids is very similar to those observed at the roof of the Mafic Complex (Fig. 8), suggesting that the last septum incorporated in the Mafic Complex was as fertile as the roof Kinzigite (Sinigoi et al., 2011)
More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

26) GARGALLO: CALDERA FILL AND CALDERA WALL
Italy, Piemonte Region, Province of Vercelli, Municipality Gargallo
Geo Coordinates: 45°43'32"N 8°23'45"E; altitude 526 m
Level of interest International
Scientific interest. Main: Geology of the basement, Petrography. **Secondary:** Structural geology. **Others:** Naturalistic, science education, environmental

Geosite GEOLOGICAL - Geology of the basement

Description
Visitors may also see the caldera wall, which is exposed at the northern margin of the caldera (N45 43 32; E 8 23 45). In proximty to the Gargallo town, caldera-fill ignimbrite contains stretched shreds of pumice termed fiamme and, immediately above, a big boulder of schist, more than 200 meters across. Welded tuff reappears above the schist boulder, before reaching the basement schists at N 45 43 41, E 8 23 37.
More details

Conservation
The site shows no conservation problem.

How to reach this site
A few steps after leaving the car

27) MONTE ROSA MASSIF AND ITS GLACIERS
Italy, Piemonte Region, Vercelli Province, Alagna Municipality
Geo-Coordinates: granitic massif and several glaciers, at different elevations
Scientific interest. Main: Glaciology, Glacial Geomorphology.
Secondary: Structural Geology. **Others:** Naturalistic, science education, environmental
Geomorphosite

Fig. 27a

Fig. 27b

Description The entire massif (Fig.27a) consists mainly of granite and granite gneiss (a metamorphic rock with foliations). The Monte Rosa Nappe lies below the Zermatt-Saas zone and is part of the Penninic nappes in the Briançonnais microcontinent zone, although its paleographic origin is controversial and is sometimes assigned to the Sub-Penninic nappes. Rocks in the paragneiss of the Monte Rosa Nappe record eclogite-facies metamorphism.[16] The deformation of the Monte Rosa granites indicates a depth of subduction of about 60 km. The Monte Rosa Glaciers included in the Geopark are Indren, Bors, Piode, Locce, Sesia (Fig. 27B) and Vigne. Other minor glacoiers can be also observed: Flua, Puoio and Otro.

More details The glaciers are the protagonists in the natural landscape of high Valsesia. Their location among the famous peaks of Monte Rosa has led to their observation by mountaineers and naturalists since the nineteenth century. For more details see the recent publication *Paolo Piccini, Luca Mercalli, Daniele Catberro "Ghiacciai in Valsesia" , SMS - Collana: Memorie dell'atmosfera 2007*.

Conservation The main threat to the glaciers is the **present-day** "global warming", due to climate change. Clearly, there are no direct actions to be undertaken by the Geopark for preventing this treat. Anyway, the Geopark has promoted and will promote conferences and lectures on "climate change" to inform citizens and tourists and to sensitize public opinion.

How to reach this site To reach Indren, Bors and Piode glaciers from the village of Alagna take the cableway to Passo dei Salati (2980 mt). Then by foot along tracks that requires good expertise it is possible to reach the glaciers. The Sesia Glacier can be reached by foot from Pedemeonte-Alagna by a long but quite easy track. Continuing on expert track is possible to reach Locce and Vigne Glaciers.

28) MONTE ROSA GOLD MINES
From 1500 to 1900 a.D.
Italy, Piemonte Region, Province of Vercelli, Municipality Alagna
Geo Coordinates: several mines and related buildings, at different elevations.
General rating: ***
Scientific interest. Main: Mining **Secondary:** Structural Geology. **Others:** Historical, environmental
Mining Geosite

Fig. 28a

Fig. 28b

Description According to some historical sources, during the sixteenth century the Scarognini family of Varallo Sesia have already exploited the Monte Rosa gold mines,. It is only since 1592 that have reliable document, when some locals asked and obtained from the governor of Milan permission to dig. During the seventeenth century the exploitation occurred mainly due to the work of the D'Adda family, from Milan, linked with the Scarognini. In 1707 Valsesia was sold, thanks to the Treaty of Turin, signed in 1703, at the Savoy. The state gradually came to Piedmont direct management of the mines. The mines did Alagna flow of a large number of miners who helped to change the demographic and social life of the village.

More details The block called "Fabbrica di San Lorenzo" (Fig. 28a) is all that remains of the three buildings that made up the "gold neighborhood" called "Kreas" in the late nineteenth century. Inside it is possible to see, four large mills for crushing gold ore, replaced at the end of the 'nineteenth century. The vast complex for refining gold was built in the eighteenth century near the "Old Quarry", already known and used in the previous century. Onother very well preserved building is the Santa Maria building, that requires some forestal work to be easily accessed. Fig 28 b.

Conservation The Santa Maria show limited conservation problem, while the "Fabbrica di San Lorenzo" was threatened by mining activity to extract felspar nearby the building. In the last years a project to recover the complex was launched, so presently the area is fenced and a development project is in place to trasnform the site into a mining museum.

How to reach this site From the village of Alagna take the road to Pedemonte than conntinue towards Rifugio pastore after five minutes walk you reach the "Fabbrica di San Lorenzo" complex. To reach the Santa Maria building from the Village of Alagna take the road to Fum bitz than the forestal road along the ski slopes, then a smatl track on the rigth that reaches the building in 10 minutes walk.

29) STOFFUL
Italy, Piemonte Region, Province of Vercelli, Municipality Alagna
Geo Coordinates:
Scientific interest. Main Alpine geology, Cultural Heritage**: Secondary:** Petrography, Structural geology. **Others:** Naturalistic, historical, environmental

Fig. 29 a

Fig. 29 b

Description We can observe here talc-bearing serpentinites, which were carved out to obtain pots (hence the term "pietra ollare", from "olla" = pot). Pots were easily carved (Fig a) with a knife in this tender rock, which consists of antigorite, actinolite and more or less abundant talc, a very tender mineral that can be scraped with a nail.

More details Already De Daussure (mountaineer scientist, 1740-1799) was surprised to see Alagna pots made of pietra olla, the so-called *laveggi*. Near Alpe Stofful (Alagna) (Fig. b) you can still see the remains of the ancient quarries in which they dug above the middle of the eighteenth century. The soapstone was often used for the construction of ovens, small stoves in use in Walser homes of Alagna and Riva Valdobbia.

Conservation The site shows no conservation problem.

How to reach this site From the village of Alagna take the track to Alpe Stofful.

30) CIMALEGNA
Italy, Piemonte Region, Province of Vercelli, Municipality Alagna
Geo Coordinates: geo-pedological track on high mountain environment
Scientific interest. Main: Glacial Geomorphology, alpine geology, pedology. **Secondary:** Structural Geology. **Others:** Naturalistic, science education, environmental
Geomorphosite

Fig. 30a

Fig.30b

Description The “Cimalegna” geological and pedological path (Fig. a) is a circular route along which were placed eight boards that illustrate the geological history of this area of Alps, the main outcrops and their soils. The route starts from the Salati pass (2,936 m. Above sea level),at the arrival station of the cableway Monrosa, then reach the Institute Scientific A. Mosso (fig b) near the Bowdwitch lake, then continue to the area of refuge then to the east up to the Col d'Olen (2,881 m), then the Horn of Camoscio (3,024 m), with a 360 ° panorama on the southern slope of Mount Rosa, on the Valsesia and Gressoney Valley finally down to the north returning to the Passo dei Salati.
More details The main soil you can observe are the following: Laghi del corno: Lithic Dystrocryept - Alpe Mittlentail: Lithic Cryorthent - Alpe Fum Bitz: Typic Dystrocryept - Corno del Camoscio South: Lithic Cryorthent - Istituto Mosso: Humic Lithic Dystrocryept - Corno del Camoscio South west: Humic Dystrocryept. For more details see the dedicated publishing of Alta Valsesia park that maintain and patrol this track.
Conservation The site shows no conservation problem due to the continuos maintenance and patrol of the park personnell.
How to reach this site To reach path starting point from the village of Alagna take the cableway to Passo dei Salati (2980 mt).

31) WOLD FUM D'EKKU
Italy, Piemonte Region, Province of Vercelli, Municipality Alagna
Geo Coordinates: geo-glaciological track on high mountain environment (about 2 hours)
Scientific interest. Main: Glacial Morphology.**Secondary:** Structural Geology. **Others:** Naturalistic, science education, environmental
Geosite Geo-morphology

Fig. 31a

Fig.31b

Description The Glacial Trail, one of the few in Italy, spread along the high Sesia valley, winding through the Valley of Bors, from "Acqua Bianca" to Alpe Fum D'Ekku (one of the stop in fig 31a). Along the way, thanks to illustrated boards, it is possible to learn about the geological and glaciological history of the visited sites (Fig 31b). The path will lead the visitors to an understanding of phenomena lasted millions of years that have profoundly acted and shaped of the landscape.
More details It 'an easy ride suitable for everyone, from late spring to autumn. Along the route is possible to observe the flora and fauna located in a unique natural environment with an extraordinary ecological balance.
Conservation The site shows no conservation problem due to the continuos maintenance and patrol of the park personnell.
How to reach this site To reach path starting point from the village of Alagna take the cableway to Passo dei Salati (2980 mt).

32) BOCCIOLETO
Italy, Piemonte Region, Province of Vercelli, Municipality Alagna
Scientific interest. Main: Peculiar morphology and genesis of the Giavine rock Tower
Secondary: Structural Geology. **Others:** Naturalistic, historical, environmental
Geomorphosite

Fig. 32 a

Fig.32 b

Description The Tower of Giavine (fig 32 a), also known as the "Tower of Boccioleto" is a massive spire of gneiss that overlooks the city and the country. The tower has become the emblem of Boccioleto. Measure from base to top, 90 m height. Below the top has a terrace with trees, known as "Giardinetto" (fig 32 b).
More details The tower denotes a typical rock detouchment structure due to the compression strength release after the glacier melting.
Conservation A part from a modet climbing activity the site shows no conservation problem.
How to reach this site From Varallo take the road 299 to Balmuccia the continue towards Rimasco-Carcoforo and reach Boccioleto in five minutes. The Tower of Giavine can be reached by two paths: south of the village along the road to San Marco Ronchi after a few bends you find the path on the left marked by a sign; otherwise you can choose the path from Ronchi, through the itinerary. 386 for Pian Sulei, rocky plateau that overlooks it from the top.

33) UNIPIANO
Italy, Piemonte Region, Province of Vercelli, Municipality Varallo
Scientific interest. Main: Geomorphology **Secondary:** Structural Geology. **Others:** Naturalistic, environmental
Geomorphosite

Fig. 33a

Fig. 33b

Description
The Unipiano Sanctuary lies on a glacial terrace, a relict of the ancient valley bottom modeled by the Sesia glacier, when it reached the Varallo area. After glacial retreat, the valley bottom has been extensively eroded by the Sesia river, leaving only some remnants of the ancient glacial landforms, such as the Unipiano terrace and the Sacro Monte of Varallo.
The Unipiano terrace is not completely flat because it is composed both by bedrock and glacial deposits. Its upper part is modeled on diorites: these hard rocks temporarily hindered the erosional processes and inferred with runoff water, favoring a small lake formation. Then mountain torrents eroded bedrock and nowadays we are witnessing a new gorge being formed**.**

More details

Conservation The site shows no conservation problem.

How to reach this site From Varallo take the road 299 to Valmaggia, then near the church take “Via al cantone” after 150 m on rigth you can find the track beginning. After 20 minutes you reach the Unipiano plateau and church.