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The pre-conference field trip (one day) was arraged by D. Sollitto, O. Simone and A. Fior and was a trip along the Gargano Headland coast partly by boat. Picture shows one of many coastal caves along this coastline. Photo: Lars Erikstad.

A geological cross-section through the southern Apennine thrust belt

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The 7th International Symposium ProGEO on the Conservation of the Geological Heritage was held in Bari (Italy) the 24-28 September 2012. The day 27th September 2012 about forty persons coming from Portugal, France, Russia, England, Turkey, Norway, Sweden, Finland and Italy participated to the post-Symposium field trip organized in collaboration with the Department of Science of the University of Basilicata and SIGEA Basilicata (Società Italiana di Geologia Ambientale). The field trip, entitled “A geological cross-section through the southern Apennine thrust belt”, consisted in a 150 Km long itinerary, starting at the front of the chain in the Craco area and terminating in the inner sectors of the chain in the Agri Valley (Fig. 1). Some of the visited areas, such as the Monte Volturino, Monte Lama and the Sasso di Castalda village, are included in the Appennino Lucano National Park. The visited sites have been censed by ISPRA as geosites (Istituto Superiore per la Protezione e la Ricerca Ambientale), even though they are actually not subject to geoconservation strategies.

The chosen outcrops allowed the observation of the main tectonic and stratigraphic units, tectonic structures and morphological features characterizing the southern Apennine thrust belt. The main tectonic units of the southern Apennines, represented by the Liguride Complex, the Campano-Lucana Platform, the Lagonegro Basin and the Apulian Platform, mainly

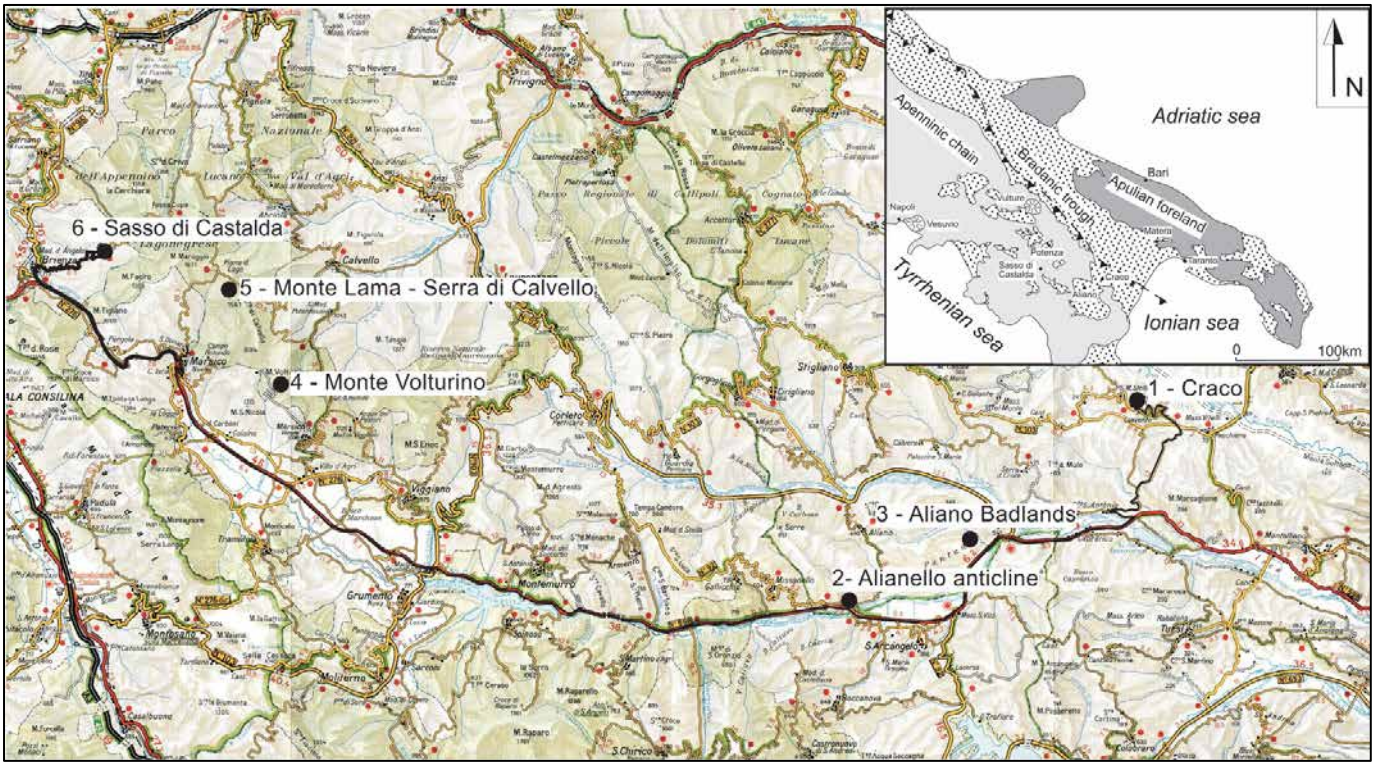


Fig. 1 – The itinerary followed during the field trip.

derive from the deformation of the northern African palaeomargin in a time span comprised between the Oligocene and the Pleistocene. During deformation a series of thrust-top basins, filling major structural depressions, covered unconformably the southern Apennine allochthonous sheets. The field trip illustrated the Sant'Arcangelo Basin that is considered one of the most representative thrust-top basins of the southern Apennines.

From the middle Pleistocene onwards the southern Apennine thrust belt was affected by strike-slip and extensional tectonics leading to the formation of a series of intramontane depressions. One of the best examples (the Agri Valley) has been extensively visited during the field trip.

The first stop of the field trip was located at Craco (Fig. 2), an impressive ghost village, located on a Pliocene steeply-dipping conglomerate succession forming at the front of the Southern Apennine thrust belt. The Craco area is considered a key sector for understanding the recent evolution of the thrust belt, since it documents the involvement of Pliocene deposits in the contractional deformation. Here, thrusts and folds facing the Bradanic Trough (the Pliocene-Pleistocene Apennine foredeep) can be observed. The village of Craco was seriously damaged and abandoned because of the presence of a big landslide. Definitive abandonment occurred after the disastrous earthquake that hit southern Italy during the 23rd of November 1980.

During the travel to the Agri Valley, the ridge separating the Salandrella-Cavone and Agri Rivers has been crossed. Along this ridge, the group encountered two important outcrops, represented by the Alianello anticline and the Aliano badlands area. The Alianello anticline is a contractional structure involving Pleistocene coarse - grained deposits filling the Sant'Arcangelo thrust-top Basin. The fold shows a N140-150 axial trend and a marked asymmetry displayed by the conglomerate-sandy strata forming the limbs. It has been related to a SW-vergent blind backthrust linked to the development of a buried out-of-sequence structure.
The badlands area of Aliano, developed on early Pleistocene marine clays, is considered one of the most striking landscapes that it is possible to observe in the Southern Apennine thrust-belt. Badlands, the Italian term of which is "calanchi", are defined as a form of rapid and severe linear erosion acting in semiarid climates. They usually characterized by deeply-incised, transversally V-shaped gullies, separated by steeply-inclined, very thinned ridges.

The ascent of the Agri Valley, allowed to observe a marked landscape change from the gentle hills typical of the Sant'Arcangelo area to the high peaks of the higher part of the valley. One of these, the Monte Volturino (1835 m a. s. l.) consists of Mesozoic, thinly – bedded, deep - water deposits of the Lagonegro Basin

Fig. 2 – The participants to the excursion in Craco. The village was abandoned as a consequence of big landslide.

(Calcari con Selce, Scisti Silicei and Galestri formations), deformed by a nearly N-trending, km-scale anticline–syncline pair. The anticline shows a box-fold geometry characterized by a flat top linked to the adjacent syncline by an overturned eastern limb. The major fold is associated to different orders of well-exposed s- and z–shaped parasitic folds, particularly well developed at the transition between The Calcari con Selce and Scisti Silicei formations. In addition, M-shaped geometries can be observed in the hinge zone.

A similar N-trending box fold, involving the Mesozoic deposits of the Lagonegro Basin, has been observed also in the Monte Lama - Serra di Calvello area. This prominent structure is more than 8 km long and shows a marked plunge to the N. Particularly, the vertical western limb of the fold, exposed along the Serra di Calvello ridge, has been observed. Here, a series of well-exposed pentagonal facets develop on the steeply dipping Calcari con Selce limestones. These structures, giving rise to a very impressive morphology, have been considered to represent remarkable example of flat-irons.

The field trip ended at the Sasso di Castalda village (Fig. 3) where both contractional and extensional structures, responsible for the present tectonic setting of the southern Apennine thrust belt, have been observed in spectacular outcrops. In particular, along the La Manca gorge the southwestern limb of a kilometre scale box fold has been illustrated in detail. The two hinge lines of the box fold are oriented around NW-SE showing a gentle plunge toward NW. In the southwestern hinge zone the dip angle of the bedding planes changes abruptly from some degrees to around 70°, with a typical kink geometry. At a smaller scale a series of parasitic folds, showing an asymmetry consistent with the main anticline, develops along the fold limbs. Parasitic folds may be associated to low-angle, outcrop-scale thrusts. In the same area the contractional structures are largely dissected by younger faults. In particular a prominent NNE-SSW oriented oblique dextral-normal (transtensional) fault cuts the previously described box fold, interrupting its lateral SE continuity. This structure, here identified as the Arenatra Fault, offsets the ScistiSilicei/Galestri boundary with a throw of about 100 m.

Fig. 4 - The group at the La Manca Gorge (Sasso di Castalda Village).

International geoheritage under threat

W.A.P. Wimbledon, Berriasian Working Group Chairman, ISCS

Crimea is that wonderful peninsula that sticks out into the Black Sea at the southern extremity of Ukraine. On the north it is steppe, a dry hell in summer, but southwards there are peaks and alpine meadows and then the south coast and the beaches. This last is the part most summer tourists visit, so they never see the flowery wonders of the steppe and the mountain valleys in spring time. Bakhchiseray palace is perhaps its most notable historical focus, with the fountain made famous by Pushkin's poem. Along the coast there are the remains of Greek cliff-top temples, Venetian castles, wonderful stands of wind-sculpted pines and extensive steppe.

This coast has been much corrupted by construction, especially giant soviet sanatoria, and much concrete, the favourite communist 'building stone'. But, away from the resorts, the coast has remained more or less natural, and it includes some spectacular and very important geology: the scenic Jurassic reefal rocks at Sudak, spectacular volcanics of Karadag and mud volcanoes of Kerch are well known. It is less known that some of the most extensive Jurassic-Cretaceous outcrops exist in Crimea. It was near Feodosia (Theodosia), in the east, that Otto von Retowski in the late 1800s made a famous collection of Berriasian ammonites, the subject of one of the first monographic descriptions of such fossils.

South from the town of Feodosia, around the headland of Ili Burnu (the original Tatar name), the cliffs and shore shows Kimmeridgian, Tithonian and Berriasian mudstones and limestones, and some stratigraphic intervals here are much thicker than those seen in western Europe, where most modern research has been concentrated. Here, until recently, apart from the lighthouse and a few war-time concrete bunkers, nothing existed except for goats, grasslands and geology. And it seemed these areas would always remain as an outdoor laboratory, a place to study animate and inanimate nature.

West and north of the Ili Burnu lighthouse, intense stratigraphic research has been in progress since the 1990s on the Mesozoic sediments and their fossils. Work to localise and define the Jurassic-Cretaceous boundary, as part of a global IUGS project, has been a key part of that. The J/K boundary is, in fact, the last system boundary that still has no defined

Plate 1 Devastation on the north side of the Ili Burnu headland

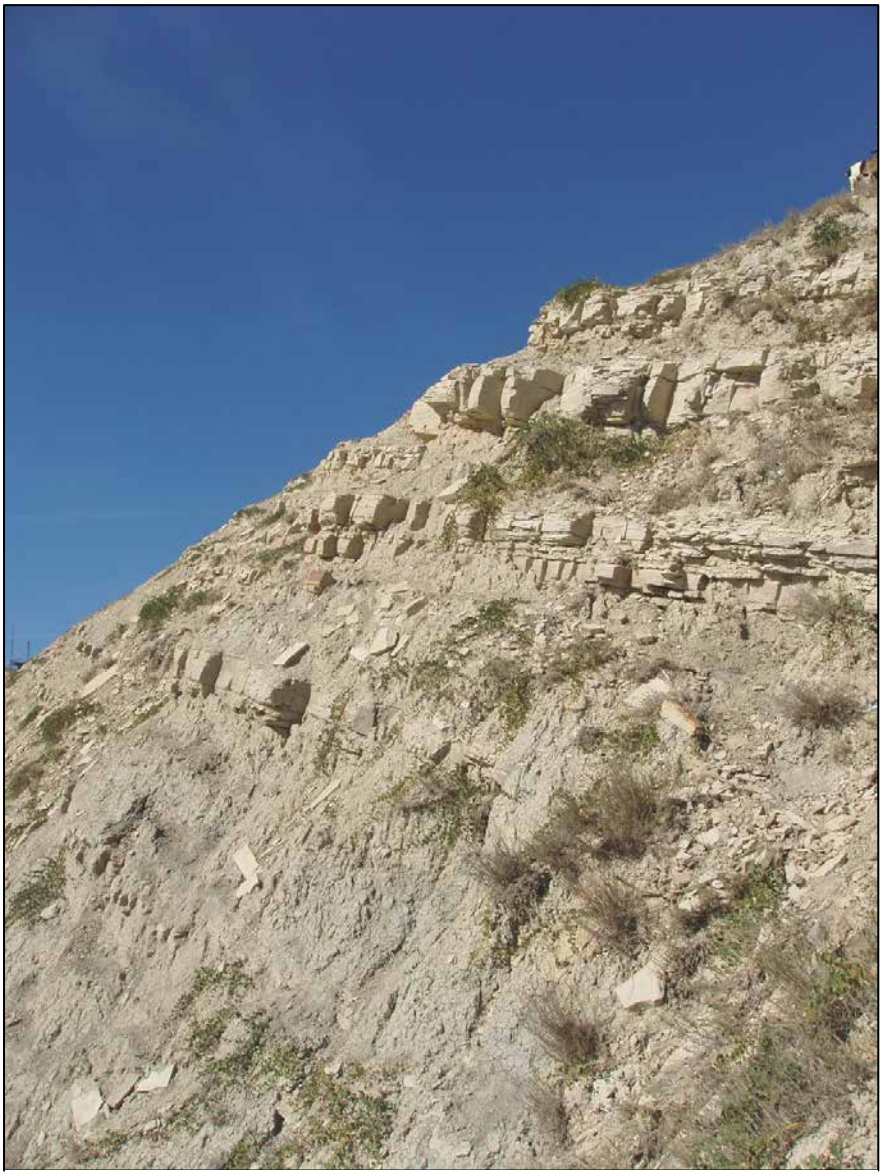


Plate 2 South side of Ili Burnu headland, below the lighthouse - former outcrops of fossil-rich Berriasian micrites and marls

GSSP, so this research has wider scientific significance. Previous work at Feodosia has not been able to place the boundary, because the ammonites employed were not common enough, nor precise enough, for the task. Therefore, under the auspices of the International Subcommission on Cretaceous Stratigraphy, a multidisciplinary team of geologists from the Geophysics Institute in Kyiv, the universities of Bratislava, Milan and Bristol, and the Geological Institute in Sofia has been assembled to study the biostratigraphy (ammonites, calpionellids, calcareous nannofossils, forams) and magnetostratigraphy at Feodosia. All of this is directed at achieving very precise correlations with other keys sites around the great Mesozoic ocean of Tethys, from Mexico to Japan.

However, in summer 2011, large bulldozers arrived on the north side of Ili Burnu. They dug up the World War II archaeology, and stripped the steppe grassland, The natural slopes were terraced, large quantities of bedrock were bulldozed onto the sea and all the geology that once existed above and along the shore was removed or permanently buried. In 2012, this work has continued. The terraces have been made larger and even more material has been pushed into the sea (photo 1). Locally, the Black Sea is actually mostly white, full of the suspended clay dumped there. The object of all this destruction has been to maximise space for the next stage, the construction of buildings. In this day and age it would be difficult to find more destructive development of a natural setting. In fact, in Europe, in this conservation-minded age, it would be difficult to find such a development at all.

Even worse, in 2012, the problem has spread, and the natural cliff to the west of the headland (photo 2) has been battered back with machines and the stratigraphy buried. The fossiliferous limestone and marl section in the photograph no longer exists.

It is clear that normal town and country planning practices and controls are not working here, and there is no geosite protection. Cliff-top development on a more or less virgin coast is normally impossible where there are proper conservation and planning systems in place. None of this development involved consultation with geologists, inside Ukraine or outside (nor, apparently, ecologists). And no-one in the administrations of the town of Feodosia and the Crimea region has the smallest understanding that they are supposed to be the guardians of this geology of European significance, the geoheritage of Ukraine and us all.

As this was one of the best J/K sections in Europe, this can be viewed as a disaster for both Ukrainian and international geology.

The Jubilee Conference "90 Years of Albanian Geological Survey", the Geoheritage session, 27 October 2012, Tirana, Albania

Edlira FILIPI, ProGEO-Albania.

The Jubilee Conference "90 Years of Albanian Geological Survey" was organized in Tirana 26-28 October, 2012. The Conference was organized by the Albanian Geological Survey, Geological Society of Albania, Tirana Polytechnic University, Tirana Institute of Geosciences, Albanian Academy of Sciences and ProGEO-Albania.

The Conference started on 26-th October, 2012, with an opening session. Scientific sessions were held on 27 October, in the lecture halls of Geology and Mines Faculty. In the scientific program of the conference there were 12 sessions of different themes within Petrology, Arkeometri, Mineral Resources of Albania, Geoenvironment, Geoinformation, Geoheritage, Fuels, Stratigraphy and Paleontology, Tectonics, Geophysics, Seismic and Seismology.

120 specialists of geological sciences, geoinformatic, geographic etc. attended the conference. There were also participants from Kosovo and other Balkan countries, from France, Poland etc.

The Session on Geoheritage and Geotourism in Albania (Photo 1) was the first of this kind prepared and held by ProGEO-Albania, since the ProGEO WG Southeastern Europe organized a similar session in Tirana in May 2005.

Photo 1. Participants of Geoheritage session. Photo: Afat Seriani

The Heritage Session included the following contributions:

- *Serjani, M. Dollma*: The Main Geo-Eco-Systems in Albania.
- *Blerta Avdia*: Geomonuments and cultural heritage as opportunities for development of geotourism and tourism in Hasi and Luma-Gora Etno-Region.
- *F. Bajraktari, S. Bahrami, M. Dollma, E, Krasniqi*: Nature monuments of Mirusha River Basin.
- *F. Shkurti*: The national inheritance of Vlora District and the opportunities for geotourism.
- *Gj. Stoja, K. Nasto*: Some prominent geosites of Korça region as opportunities for geotourism.
- *M. Delilaj*: Geomonuments in Permeti district, some new geosites and their use for tourist development.
- *K. Ngjeci*: Geoturist Resource Assessment of Hasi Crossborder Region.
- *M. Dollma, F. Pazari*: Geoinformation of the glacial geomonuments of Albania
- *Pambuku, A. Gelaj, A. Dhimitri*: Improvement of GW monitoring system in Albania.
- *S.Avdullahi, A.Serjani, I.Fejzaj, A.Tmava*: Gadime cave (Kosovo), geoturist values, impact.
- *Grazhdani, A. Neziraj, and A. Serjani*: Dumrea karst lakes a beauty of nature on evaporate diapir.
- *N.Karaj, H.Noka, I.Alliu, S.Bushi, S.Shabani, S.Hoti, A.Neli*: Glacial lakes of Bulqiza and Lura ophiolite massifs, as special offer for mountainous geotourism
- *J. Dunga*: Caves as opportunities for development of tourism in Lekbibaj (Tropoja).
- *E.Filipi, F. Pazari*: Geotouristic values of Osumi, Lengarica, Skrapari and Grunasi canyons.
- *E. Menkshi, E.Filipi*: Geoheritage of Korça Country and its tourist values.
- *G. Ismaili*: Assessment of tourism in the Gjallica Mountain (Kukesi region).
- *L. Kaziu*: Geosites and cultural heritage as opportunities for geotourism development in Pogradeci district.

Photo 2. Participants of the geotrip in Rubiku. Photo: Afat Seriani

Photo 3. Krasta flysch. Photo: Afat Seriani

The conference was a good occasion for sensibilisation, and dedication a bigger attention to Geoheritage, Geosites, Geoparks and Geotourism in our country, to draw the attention of the scientific and the most specialized institutions and furthermore, their readers.

All presentations were prepared in a English version and presented in English, or Albanian. An electronic version of these presentations are prepared as a book in the series of Geological Sciences Bulletin, published also in the Publications columns of the WebPage of Albanian Geological Society.

Photo 4. Carbonate formations of Albanian Alps (right above) overthrusted on Cukali Flysch (left, below). Photo: Afat Seriani

On 28 October a Field Trip was organized in the Tirana-Rubik-Lezh-Vau- Dejës area with about 50 participants, between them a lot of ProGEO-Albania members. During this Trip the Tirana molasse syncline was crossed, the so called Tirana Basin. In Miloti the tectonic fault, where Krasts Tectonic zone is overthrusted on Kruja Carbonate Platform was demonstrated. In this locality the Mirdita flysch formation is thrusted on the Krasta flysch formation (Photo 2). Northwest of the Rubiku miner's town, on the slope of the Fani River we visited the remains of the Rubiku copper mine, one of the oldest mines in Albania, known since ancient times.

On the nord cliff of Buna River, before entering to Shkodra city, the tectonic overthrust of carbonate rocks of Albanian Alps over the Cukali flysch was demonstrated (Photo 4). We also stopped at the Black Stone (Guri i Zi) (Photo 5), which is an erosion form of volcanic rocks.

At Vau Dejës the intercourses between ultrabasic rock of the Gomsiqe Massif with amphibolites, which are considered as the bottom of Mirdita Ophiolite was studied and the scenic view of Vau Dejes lake were enjoed. We also had time to enjoy the historical city of Kruja, at the Scanderbeg mausoleum in Lezha, and Rozafa Castele in Shkodra.

The impressions from this Feild Trip were incredible, especially for those who participated for the first time.

Photo 5. Part of participants at Guri Zi (Black Stone) geosite in Shkodra Region. Photo: Afat Seriani

Geological heritage and geoconservation at the north western edge of Europe

ProGEO Working group for Northern Europe 2013 Meeting in Newcastle upon Tyne, UK

16 – 20 September 2013

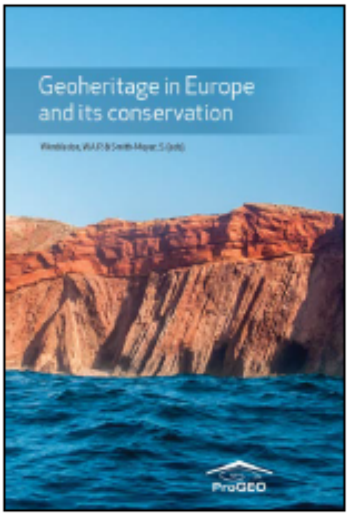
Including Scientific sessions at Northumbria University, Newcastle upon Tyne and field excursions:

- Northumberland Coast – how geology, landscape history and tourism interlink. Itinerary – Woodhorn colliery – a former coal mine area now a cultural attraction, Lindisfarne (Holy Island), Bamburgh Castle and the Farne Islands (weather permitting).
- West of Newcastle to Hadrian's Wall and Whin Sill and North Pennine Orefield localities (19th century mining area in the North Pennines Area of Outstanding Natural Beauty and Geopark)
- County Durham– including the classic Magnesian Limestone localities of the Permian (linked to Limestone Landscape project) and Durham Cathedral – geological setting and building stones

More information will appear in the 1 circular on the ProGEO website in February. Contact: Lesley Dunlop, mail. lesley.dunlop@northumbria.ac.uk.

Lindisfarne Priory which is built on the Whin Sill, a dolerite sill. Photo: Lesley Dunlop. The Whin Sill also underlies much of Hadrian's Wall.

The only record of the history of our planet lies in the rocks beneath our feet: rocks and the landscape are the memory of the Earth. Here, and only here, is it possible to trace the processes, changes and upheavals which have formed our planet over thousands of millions of years: the more recent part of this record, of course, includes the evolution of life, including Man. The record preserved in the rocks and landscape is unique, and much of it is surprisingly fragile. Today it is threatened more than ever. What is lost can never be recovered, and therefore there is an urgent need to understand and protect what remains of this our common heritage.



Geoheritage in Europe and its conservation

For the first time a comprehensive overview of geo-conservation in Europe has been presented in a book. The book includes specific contributions from 37 countries focussing on legislation and geoconservation practices.

The book can be purchased on the ProGEO website:
www.progeo.se

The European Association for the Conservation of the Geological Heritage (ProGEO) works to promote the conservation of Europe's rich heritage of landscape, rock, fossil and mineral sites by involving all countries in Europe and exchanging ideas and information in an open forum.

Wimbledon & Smith-Meyer. 2012. Geoheritage in Europe and its conservation. ISBN: 978-82-426-2476-5
Price for Europe: 45€ , rest of the world: 50€. Special price for ProGEO Members! Become a member today!

Coming events:

Always check www.progeo.se for updated information!

European Geosciences Union General Assembly. Special Session: Geodiversity and geoheritage in geoscience research (session SSS6.3/GM1.5).

Vienna, Austria, 7–12 April 2013.
Convener: Emmanuel Reynard. Co-Conveners: Hanneke van den Ancker, José Brilha, Erik Cammeraat. Deadline to submit abstracts: 9 January 2013. Please visit http://www.egu2013.eu/.

Geological heritage and geoconservation at the north western edge of Europe. ProGEO Working group for Northern Europe. 2013 Meeting in Newcastle upon Tyne, UK

16 – 20 September 2013
Contact: Lesley Dunlop, mail. lesley.dunlop@northumbria.ac.uk.

12th European Geopark Conference. Geoparks: an innovative approach to raise public awareness about geohazard, climate change and the sustainable use of our natural resources.

Cilento and Vallo di Diano Geopark is hosting the 12th EGN conference, in Ascea-Velia-Elea, southern Italy, 4–6 September 2013.
Please see the first circular, and visit http://egnconference2013.cilentoediano.it/index.asp?ref=pagine&id=109&lan=ita.

Deadline next issue of ProGEO NEWS: Mars 15th 2013

Please do not forget to send contributions to ProGEO NEWS. Members are interested in things that happen all over the world, your experiences, geosites, everyday geotopes and landscapes, geoconservation and geotourism efforts! ProGEO news is published on the internet

www.progeo.se

Please send your contributions 500 – 2000 words with photographs, maps and figures clearly marked as a ProGEO NEWS contribution to:

lars.erikstad@nina.no

If longer texts are needed, please contact the editor

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