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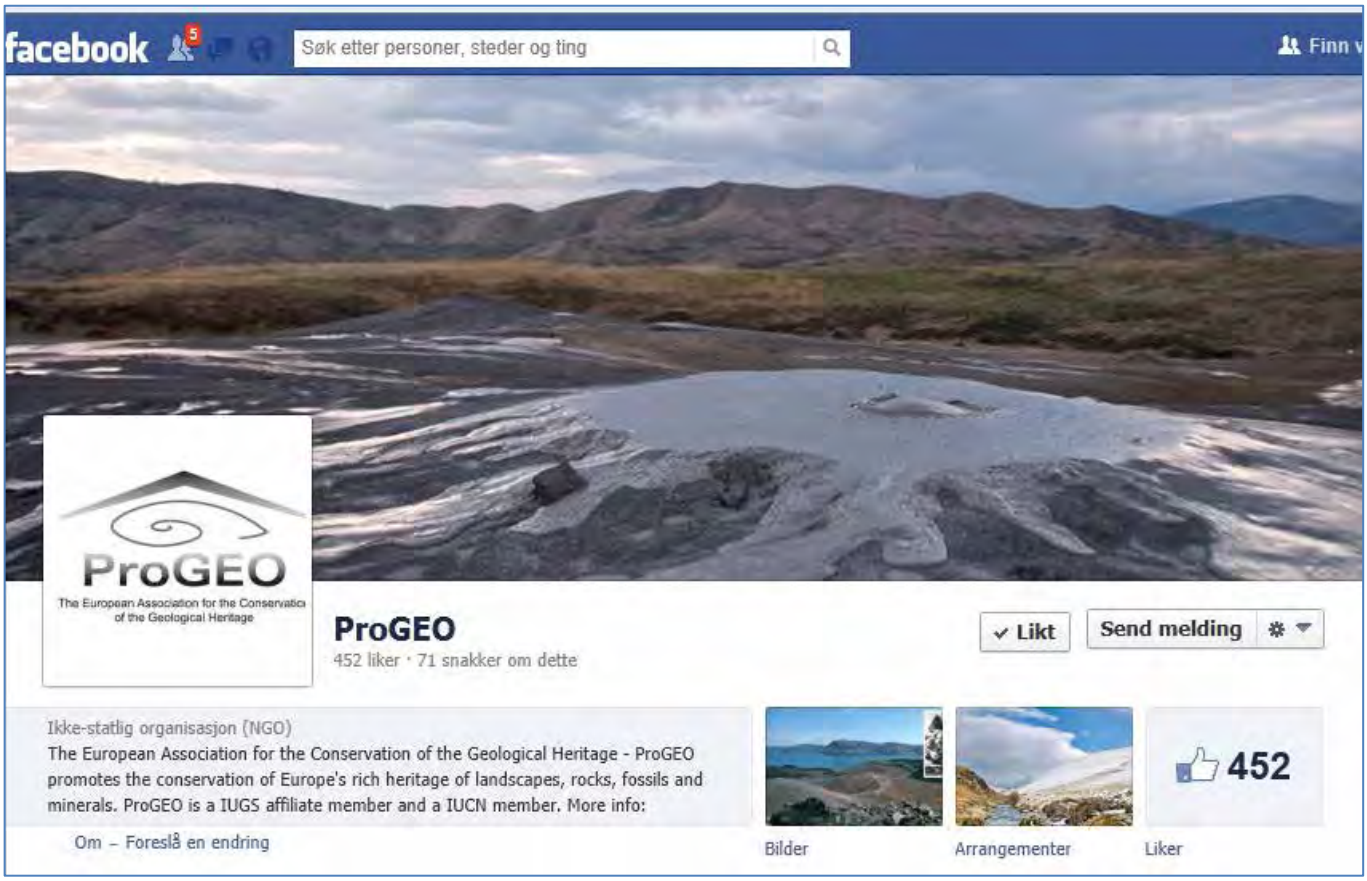


ProGEO is now on Facebook!

Mariana Vilas Boas (Portugal), e-mail: mariana1763@gmail.com

Social networks are important means of communication and dissemination of ideas among internet users. In order to expand its communication with society, ProGEO joined Facebook on March 2013. The main purpose of this new Facebook (FB) webpage (www.facebook.com/progeo.geoheritage) is to spread the word about geo heritage, reaching more people, particularly young people that are usually "heavy" Facebook users!

This new FB page does not replace the official ProGEO webpage (www.progeo.se) or ProGEO News. It works as an "alert" for news, events, geo sites, new papers published in the journal Geoheritage, etc.

This FB page is updated quite regularly with information about geoheritage-related events that are happening in different countries (conferences, courses, seminars, etc.), short news (that could be extended in ProGEO News), everything that may raise awareness of geoheritage. With the collaboration of ProGEO colleagues from different countries, the FB webpage is showing in each month photos of geosites of a certain country. In April it was Portugal in May, Norway, in June, Greece and in July it will be Spain.

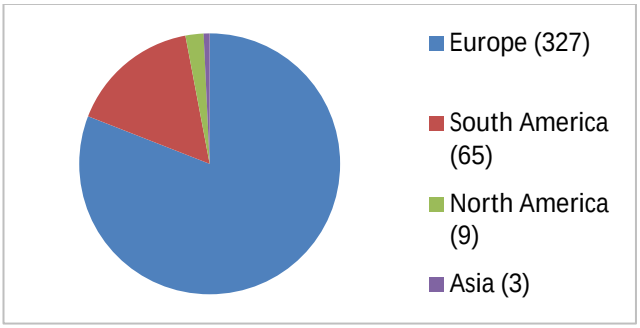
From March to early June, the FB webpage got around 450 "likes" and has reached people from 21 countries, mainly from Europe, followed by South America, North America and Asia (see graph 1).

Based on the information registered by each user of Facebook, we may conclude that males and females are reading the ProGEO FB webpage in the same proportion and that the higher percentage of «likes» is from users between 18 -34 years old. On the other hand, the age groups 13-17 years and more than 65 years are responsible for the lowest numbers.

Posts with photos of geosites are well received by users and are among the most viewed, commented and shared. Table 1 shows the 10 posts with the highest impact during these first months of activity. For

each post the number of individual persons who have seen the publication (the first 28 days after the post is published) is shown.

With this FB webpage ProGEO can catch the attention of more people, maintaining a close proximity with actual members and attracting potential new members. Some persons have contacted us spontaneously to publish information about geoheritage-related events that are happening in their countries and even proposing photos of geosites. The challenge to gather more "likes" on the ProGEO FB webpage can only be accomplished with the help of all of us!



Graph 1. Number of people who have "liked" the FB page, divided by continents.

Table 1. The 10 posts with higher impact during the first two months of activity.	**Number of persons who have seen the post**
Geosites of Europe: "Monsanto granite inselberg (Naturtejo Global Geopark, Portugal)".	1.918
Geosites of Europe: "Earth pyramids (Norway)".	1.282
Event: "Geoconservation Award 2013 (Portugal)".	1.204
Event: "Intensive Course on Mountain Geomorphosites 22-25 August 2013, Lausanne, Switzerland".	1.108
Paper published on Geoheritage (April 2013) "The Nature Conservation, Geotourism and Poverty Reduction Nexus in Developing Countries: A Case Stud".	599
Geosites of Europe: "Fossilized tree-trunk (Greece)".	518
Event: "IGC 35 - South Africa 2016: News from the Local Organising Committee".	505
Geosites of Europe: "Capelinhos volcano (Faial island, Azores Global Geopark, Portugal)".	494
Article: "Smuggling of fossils".	410

Geological monuments of the Kryvyi Rih and criteria of their definition

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Kryvyi Rih (Кривий Pir) is situated in Dnipropetrovsk Oblast, to the southwest of the administrative center, Dnipropetrovsk and at the confluence of the Inhulets and Saksahan rivers. This is one of the most interesting regions in Ukraine, which contains numerous and unique geological objects. The region comprises Granitoids of Lozuvatka village, Quartzites of Lativka village, Amphibolites of Rakhmanovo village, Outcrop of Skeliuvatka Suite of Paleo-Proterozoic Kryvyi Rih Series, «Sceli MODRu» (Orlyne Gnizdo), Balka Pivnichna Chervona, Karachunivski granites as well as Kirov historical and geological monument.

Granitoids of Lozuvatka village

On the right bank of Inhulets River, near the Lozyvatka village, picturesque cliffs of plagiogranites of Dnipropetrovsk complex are exposed. They are connected to plagioclase migmatites. The granitoids are suggested to be of ultrametamorphic origin and contain relics of amphibole-biotite gneisses and crystalline schists (Fig. 1). The nature of this rock association indicates that the formation of these litotypes occurred in the

Fig. 1. Biotitic gneisses of the Aul series with migmatitites

Fig. 2. Folding at dynamic rock flowage in migmatites

following sequence: amphibole-biotite gneisses and schists → plagiomigmatites → plagiogranites. In some outcrops of migmatites small folds of dynamic rock flowage are observed (Fig. 2). It may testify to the plastic-nature of the rock mass during the formation of migmatites.

This is consistent with the general ideas of permobile (semi-molten) nature of geological environment at the early stages of protocontinental crust-formation [2].

Karachunivski granites

On both sides of the Karachunivske water storage basin, the Inhulets River forms picturesque cliffs with benches and small waterfalls. They are composed of grey and pink-grey biotite and amphibole-biotite plagiogranites and plagiomigmatites of the Meso-archean Inhuletsky complex. Chemically and physically their properties are similar to the Saksaganski plagiogranites (Fig. 3).

Fig. 3. Outcrop of plagiogranites and plagiomigmatites of the Meso-archean Inhuletskyi complex

Relicts of amphibolites occur within the plagiogranites, their bodies are elongated in accordance with strike features of the host rocks. Granitoids are cut by numerous veins of aplite-pegmatoid granites and diabase dykes. U-Pb dating of diabase zircon yields the age of 2750 Ma. This is one of the best preserved exposure of Inhuletskyi complex plagiogranitei and migmatites found in Karachunivsko-Lozuvatska syncline [1].

Quartzites of Lativka village

Strata of light-grey and white quartzites that form the base of Konka series are exposed in a cliff massif – (250-300 m long and up to 15 m high) that outcrops near the paved road between Lativka and Starodobrovolske villages (Fig. 4).

According to structural and textural characteristics fine-grained quartzites interbedded with medium- and coarse-grained varieties similar to metasandstones,

Fig. 4. General view of the outcropped micaceous quartzite

and in some cases to – metagravelites are distinguished. Possible sources of terrigenous material are considered to be weathered plagiogranitoids. It is the best outcrop of white micaceous quartzites that has been found in Ukraine.

Amphibolites of Rakhmanovo village

In the south-eastern margin of Rakhmanovo village, in the floodplain of the Inhulets River valley, amphibolites are exposed (Fig. 5). Basing on mineralogical, petrographical and petrochemical features amphibolites might be described as metamorphosed dacite, andesite and tholeiite rocks that make up three-component paragenesis typical for greenstone sections. The age of these rocks is about 3000-2960 Ma.

Amphibolites are fine-grained, dark-green, massive rocks composed of hornblende, biotite, quartz and feldspars. The characteristic feature of amphibolites is the presence of spheroidal jointing (Fig. 6) and inclusion of quartz and quartz-carbonate amygdules in the rocks. These two features indicate a possible submarine volcanic eruption (at the bottom of Kryvyi Rih mesoarchean paleobasin).

Outcrop of Skeliuvatka Suite of Paleoproterozoic of Kryvyi Rih Series

Metaconglomerates, metagravelites and metasandstones which form two- and three-fold rhythms of regression (Fig. 7) are situated on the left bank of the Inhulets River near the Southern Processing Plant worker's village. Cliff exposures are 8-15 m high and 350-400 m long.

The lower members of the rhythms are represented by metasandstones or metagravelites, and upper members by metaconglomerates. Two-component rhythms represented by association of metagravelites + metaconglomerates are predominant. Coarse-pebble (up to boulder) - metaconglomerates are found to be predominant in the south-eastern part of the outcrop. Metaconglomerates occur as 1-5 m thick packets with pebbles, reaching the size of 5 – 7 cm. Most pebbles have typical fusiform shape (Fig. 8). A metagravelite-sandstone packet which build up a section of the formation, is exposed 150-170 m upstream from the exposure of metaconglomerates, (Fig. 9).

Interbedded metagravelites and metasandstones are observed in the lower part of the section. From the bottom to the top of the section the thickness of metagravelites decreases from 2 – 3 m to 10 – 20 cm and sandstones increases (Fig. 10). These rocks are similar in their appearance and mineral composition. They are light-grey, variously grained feldspar-quartz formations. At the distance of 25-30 m upstream the river feldspar-quartz metasandstones are exposed in a steep cliff with - length of 12 – 15 m and height of

Fig. 5. Outcrops of metabasalts in the floodplain of the Inhulets River

Fig.6. Fragments of spheroidal jointing in metabasalts

Fig. 7. Metaconglomerates outcropped on the left bank of the Inhulets River

Fig. 8. Pebble distribution in metaconglomerates

Fig. 9. Outcrop of the metagravelite-sandstone packet

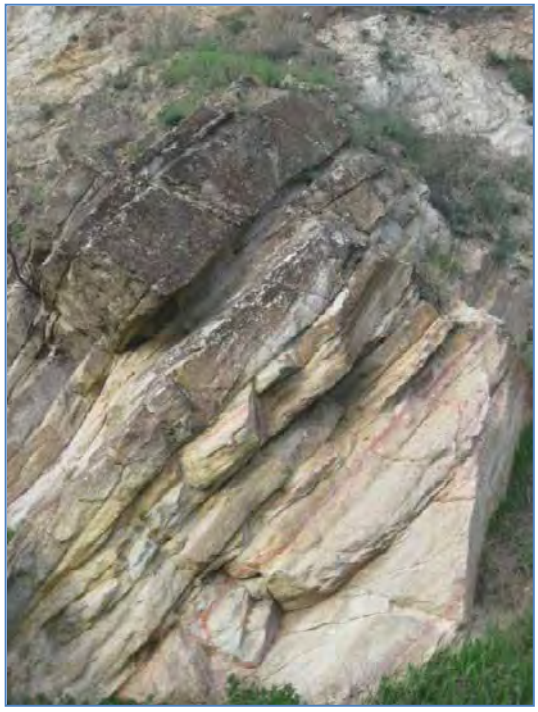

Fig. 10. Interbedded metagravelites and metasandstones

Fig. 11. Outcrop of ferruginous quartzite of Saksahanska suite on the left bank of the Inhulets River

10 m. Mineralogically and petrographically these rocks are similar to those described above. Metasandstones contain 3-5 cm thick interbeds of metasiltstones.

In the very northern parts phyllite schists can be found on the slope as rock debris and small outcrops. The schists are fine-tabular, dark-grey with a greenish tinge rocks, composed of sericite, biotite and quarts.

Predominant distribution of conglomerate-gravelite-sandstones paragenesis in the section and its upward gradual replacement by sandstones - schists indicates that sedimentation occurred at the transgression stage of the basin formed in opening protorift structure [2].

Sceli MODRu (Orlyne Hnizdo)

The Modrivska historical and geological monument is a site of national significance. It covers 62 hectares and is situated in the Central region of the city. On the left bank of the Inhulets River ferruginous quartzites, interbedding with shales are exposed as picturesque cliffs of 2 km length (Fig. 11).

The Nature reserve holds geological interest due to the folding found in productive ferruginous-siliceous rock masses (Fig. 12). The largest fold is represented by Tarapako-Lykhmanivska anticline with - the length of 15 km and width of 2.5 km. The section includes five ferruginous and five schist horizons interbedded. The schist horizons include quartz-amphibole and quartz-chlorite-amphibole varieties as well as barren quartzites. Ferruginous horizons are represented by silicate-magnetite, hematite-magnetite and martite quartzites.

Balka Pivnichna Chervona

Balka Pivnichna Chervona is located in the northwestern margin of Veseli Terny village. This nature reserve has complex importance as the statel landscape reserve with unique plant associations, diversity

Fig. 12. Folding in ferruginous-siliceous formations of the Saksahanska suite

Fig. 13. General view of Balka Pivnichna Chervona

of natural landscapes and an unique geological structure (Fig. 13).

Balka Pivnichna Chervona includes exposures of shale and ferruginous horizons of the Saksahanska suite. The rocks of ferruginous Fourth, shale Fifth, ferruginous Fifth, ferruginous Sixth and shale Sixth horizons are exposed here. Slate horizons are composed of chlorite, biotite-chlorite, biotite-quartz schist and barren quartzite. All mentioned rocks form interbedded layers of 1 to 3 cm thickness. Ferruginous horizons are represented by interbedded layers of iron and barren quartzites and shales. Ferruginous quartzites, with banding structure are predominant in their composition. Banding is a result of interbedded nature of ore and barren layers up to 1 – 1.5 cm thick. Ore layers are composed of magnetite, martite, hematite and barren – of quartz and carbonate.

The northwestern slope of the left branching is composed of a light-grey layer of unmetamorphosed quartz sandstone that is exposed in numerous boulder-like outcrops. The sandstones overlies the ferruginous quartzites of Saksahanska suite with an angular unconformity. At the bottom of the Paleozoic terrigenous section, the sandstones contain lenses of turbidite-like rocks. These rocks are represented by chaotic accumulation of ferruginous fragments and barren quartzite of the Saksahanska suite and carbonaceous shales of Gdantsivska suite, Kryvorizhska series. They are cemented by sand and clay material (Fig. 14). Their thickness reach 1 m.

Moreover, in the bottom part and on the slopes of Balka Pivnichna Chervona boulders with size range of 0.5 x 0.5 m to 1.5 x 2.5 m have been found. Their origin is a matter of continuous discussions (Fig. 15). They are considered to be either impactites formed after an ancient meteorite or distinct varieties of kimberlites or even tectonic breccias.

Kirov historical and geological monument

This monument is located in the Kirov Mine region on the right bank of the Saksahan River. Here phyllite schists, talc-carbonate rocks and sediments of the lower part section of the productive ferruginous-siliceous section of the Kryvbass region are exposed. Phyllites schists are dark-grey fine-grained schistose rocks that are composed of biotite, sericite and quartz. At the distance of 70 m from the exposures of the phyllite schists light gray, fine-medium- grained and greasy-in-touch talc-carbonate rocks are outcropped (Fig. 16). They are composed of talc, chlorite, carbonate and some quartz. In places quarts-carbonate inclusions (amygdules) are present in the talc-carbonate rocks. The presence of these amygdules is the evidence of possible submarine volcanic activity at

Fig. 14. Outcropped boulders of turbidite-like rocks

Fig. 15. Boulders of impactites in Balka Pivnichna Chervona

Fig. 16. Outcrop of talc-carbonate rocks of the Skeliuvatska Suite

Fig. 17. Monoclinal dip ping of the Saksahanska suite rocks exposed on the right bank of the Saksahan River

the b ottom of the P aleo-proterozoic sea of about 2300 Ma.

Within the Kirov historical and geological monument site f erruginous-siliceous r ocks o f p roductive rock mass form a cliff outcrops with the length of 250 m and the height of 20 m. It is situated on the right bank of the Saksahan River, 200 m to the south of the Pivnichna Mine (Fig. 17). Here intercalated layers of quartz-chlorite-sericite, quartz-graphite-sericite s chists and barren quartzite and ferruginous quartzite horizons can be observed. The schists are characterized by dark-gray to black colour with well-defined schistosity. They are composed of chlorite, sericite, biotite, graphite and quartz. The rocks show fine-grained structure and fine-layered texture. Ferruginous quartzites are fine-grained massive r ocks r epresented by intercalatation or e and barren quartzite bands with thickness ranging from 0.5 to 1. 5 cm. Ore band s ar e composed of m agnetite, carbonate, quar tz, and bar ren band s of quar tz w ith minor chlorite, sericite and biotite [2].

Natural value and management

Each of these geological monuments is unique natural object that has special educational, scientific, aesthetic and cultural importance. They make it possible to study the nature of geological (endogenous and exogenous) processes, to investigate t he g eological hi story o f Kryvyi Rih, and to get a general idea about the geological structure of the Kryvyi Rih basin. Unfortunately, many na tural m onuments ar e be ing de stroyed a s a result of l andfalls, t ali, weathering and s ubsidence processes. A t p resent, these unique o bjects are al so being destroyed as a result of anthropogenic activities. To provide the sustainable use, protection and conservation of geological monuments it is important to make a comprehensive assessment based on certain criteria.

Criteria we use are as follows:

- degree of spread (distribution): un ique, r are, common;
- completeness of geological processes representation: total, partial;
- number of geol ogical pr ocesses t hat c an be observed within the object;
- vulnerability: slightly vulnerable, vulnerable, very vulnerable;
- morphometric c haracteristics: l ength, height, area of distribution;
- the a vailability of i nfrastructure, i ncluding transportation: m onuments t hat are s ituated near urban centre, roads and other objects of tourist importance; m onuments that are situated at s hort distance (non-remote); s ites that are s ituated f ar f rom ur ban c entre, roads;
- environmental c ondition i s c haracterized b y the n atural s tate of t he ob ject and t he e nvironmental condition of the area (terrain): satisfactory, unsatisfactory;
- the pr esence of of ficial c onservation s tatus: geological sites of national, regional, local importance and not registered;
- aesthetic value: high, low.

According t o the direction of de velopment, e valuation criteria are divided into two groups: the first three are the criteria that determine the fundamental, importance and others that define practical importance.

A c omprehensive assessment of geo logical monuments o f t he K ryvyi R ih ba sin ha s been conducted according t o the listed c riteria. I t w as det ermined that the m ajority of objects were unique and with a considerable degr ee of v ulnerability. They ar e c haracterized by a c omplete r epresentation of geological p rocesses (in num ber of 2 to 5) , w ith f avourable m orphometric characteristics (object length is less than 500 m, but more t han 100 m i n ar ea or l ess t han 1 he ctare bu t more than 100 square meters) and characterized by the presence of def inite infrastructure. The objects have a high aesthetic v alues and s atisfactory e cological en vironment, bu t it should be n oted t hat most o f them need immediate protection. Most of the geological m onuments ha ve local i mportance, bu t t here is a need of their l egal registration, which will make it possible to provide additional measures for their conservation and s ustainable us e i n s cientific and educational purposes.

References

Geological Landmarks of Ukraine (V.I. Kalinin, D.S. Gurskiy, Eds.). In four volumes. – Kyiv, 2006, - Volum II. – 320 p.

Paranko I.S. (2011). Geological field training in Kryvbass region. Workbook f or t he first-year s tudents o f n atural science speciality. - Kryvyi Rih, ed - p. 98. (in Ukrainian).

Geoconservation in the North

Lars Erikstad, e.mail: lars.erikstad@nina.no

Habitat Contact Forum VII, in the Barents Euro-arctic region working group on Environment, Nature Protection subgroup was arranged in Bodø, Nordland County, Norway from the 11th to the 13th of June 2013. The Habitat Contact Forum activities are a part of the activities of the Nature Protection Subgroup of the working Group of Environment of the Barents Euro-Arctic Region, this year under Finnish Chairmanship.

For the first time geodiversity was covered in an expert meeting like this. One session was used for discussion of geodiversity, geological heritage and geoconservation within the Barents region. General presentation on the issue was given as well as special reports from Russia and Sweden. ProGEO as an important association for European geoconservation was presented.

The excursions did also focus on important geoheritage elements. One night excursion to the tidal current Saltsstraumen was a special experience in the light arctic night as well as visits to caves in this county that have most of the Norwegian limestone caves in Norway.

To the left: Caves in the county of Nordland, an important part of its geological heritage. Photo: Gunnar Kjærstad; Above: Geological heritage of the Komi Republic, Russia was presented on the meeting.

It is the seventh meeting of this sort was experts from Norway, Sweden, Finland and Russia meet to discuss nature conservation issues in the Barents region. The event was attended by 50 persons through presentations, discussions and excursions. The Norwegian directorate for nature Management hosted the meeting

In the final meeting resolution Geodiversity is mentioned like this: "*It is a need to raise awareness of geodiversity values and the connection between geodiversity and biodiversity in the BEAR. To safeguard the geodiversity heritage, a selection of geotopes should be protected. The necessity for the inventories and identification of sites with high values of geodiversity is rapidly increasing with the growth of land use, e.g. road construction and mining industry in the BEAR. Often the sacred sites are geosites by their characteristics. Conservation of geodiversity should better be integrated in the nature conservation as an essential part along with biodiversity and cultural heritage conservation.*" BEAR = Barents Euro-Arctic Region

Summer night at Saltstraumen. Photo: Gunnar Kjærstad

Other important issues on the meeting were a strategy for forest protection in the region and the impacts of climate change here in the northern parts of the Euro Asiatic continent.

The Barents region cooperation was established in Kirkenes (Norway) in 1993 as a key-stone for northern international cooperation. This meeting in Bodø is a part of this cooperation as a contact forum for habitat conservation.

Next meeting in this contact group will be in 2015 in the Russian federation.

Establishment of the International Association for Promoting Geoethics

Margaret Brocx. Email: geoheritage@iinet.net.au

The impetus to create an International Association for Promoting Geoethics (IAPG) was strengthened during the 34th International Geological Congress (IGC) in Brisbane, Australia, where it became apparent that, over and above the participants of the Symposium on Geoethics, there were points of view from many Geoscientists, from different disciplines, and countries around the world that these also should be considered in not only starting an Association, but in developing the discipline Geoethics. The IAPG was founded to provide opportunities for public discussions and the fruitful exchanges of ideas in the belief that the plurality of views is a great opportunity for development and growth in science, and representatives sought from around the world.

IAPG, as the name implies, stands for promoting the theoretical and practical aspects of Geoethics. Geoethics is the meeting point of Geology, Sociology and Philosophy and is relatively a new branch of Geosciences. It emphasizes the Eco-friendly and Socio-friendly development of natural resources like minerals and ground water. It also promotes equity and efficiency while mitigating geohazards such as floods, landslides, droughts, earthquakes, tsunamis and volcanic activity. Geoethics aims at creating awareness in the society about the value of natural resources and also about the importance of Geo-heritage, Geo-parks, Geo-tourism and Geo-medicine. Through its Website and the activities of its Membership, including research, the IAPG would strive to spread the message of Geoethics amongst the Politicians, Policy-makers and the civil society. It would also try to educate Geoscience students and practitioners through Geoethics sessions in Geoscience conferences and Workshops

The IAPG was formerly established under Italian Law in December 2012 and the publication of the first special issue entirely dedicated to Geoethics was published in the international JCR journal "Annals of Geophysics" Vol 55 No 3, 2012 (http://www.annalsofgeophysics.eu/index.php/annals/issue/view/482);

The Inaugural Executive Committee consists of Stefano Tinti (Italy) (President), Susan Kieffer (USA) and Shrikant Limaye (India) (Vice presidents), Giuseppe Di Capua (Italy) (Secretaru general) and Giuseppe Di Capua (Italy) (Treasurer).

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The Continental Coordinators are responsible for coordinating activities, consistent with IAPG aims and goals, within their respective continents. This includes promoting studies and reflections on Geoethics and practical applications in relation to the specific problems occurring in their continent, the publication of scientific articles dedicated to Geoethics and geological culture, the organization of meetings and sessions on Geoethics in national and international conferences.

For more information on the IAPG and its activities see **http://www.iapg.geoethics.org/**
or email Silvia Peppoloni: **silvia.peppoloni@ingv.it**

Coming events:

More information on **www.progeo.se**

ProGeo Working Group/NW Europe Meeting: Geological heritage and geoconservation at the north western edge of Europe.

16–20 September 2013, in Newcastle upon Tyne, UK. Abstract dead line is 15 July.

The XX Congress of Carpathian Balkan Geological Association, CBGA 2014.

a jubilee Congress, which will be held from 24 to 26 September 2014 in Tirana, Albania. t http://www.cbga2014.org/.

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, southern Italy, 4–6 September 2013.

http://egnconference2013.cilentoediano.it/index.asp?ref=pagine&id=109&lan=ita.

International Conference. Unique Geosites of Russia:

Conservation and recreation potential. The Federal Agency of Mineral Resources and VSEGEI invite us to attend this conference in St Petersburg, Russia, 27–29 June 2013.

Deadline next issue of ProGEO NEWS: October 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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