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Figure 1: The volcanic island of Jan Mayen with the 2277 m high volcano Beerenberg is now considered to achieve a protected status. Photo: Kirsti Høgvard.

Increasing interest for the conservation of geological sites in the West European Arctic

It is less than a decade ago, when our institute was requested to write a state-of-the-environment report on the natural and cultural heritage on the Arctic island of Jan Mayen. Those planning the report wanted to give detailed information on historical human activity, climate, flora and fauna and pollution issues. Geology was not even mentioned. Jan Mayen is completely formed by volcanism, and everything that lives and happens there meets the preconditions of a unique, rough and inhospitable volcanic environment. Geology should have been the first to think of!

Since, awareness has gained ground. A few days ago a press release from the Norwegian Minister of the Environment said that large areas of Jan Mayen are now under consideration for gaining a protected status – as a precaution for possible future threats. The presence of unique geological features is mentioned as one of the criteria. The Minister himself said that it must be up to the volcanic activity to shape the future of the island, and humans should not interfere but observe.

Nothing has really been done to document the geological conservation values of the island. The above-mentioned report recommends to register the various morphological and geological features of the island and to describe their values in contexts like education, research and documentation. Hopefully, the new initiative of the Minister will make something like this happen.

In 2002 the Nordic Council of Ministers initiated a project comprising Svalbard, Iceland and Greenland, which was to elaborate common criteria for the conser-

vation of cultural and geological sites in these countries. The project is now in its final phase. We, who work on it, got interesting insights into the various practices and the considerations from the respective areas.

Svalbard is an area under Norwegian sovereignty, but administered on the basis of an international treaty (1920), which guarantees that all citizens of ratifying countries are to be treated equally. Environmental protection has gained a high political status there. Norwegian authorities claim to render Svalbard into one of the world's best-managed wilderness areas. By now, approximately two thirds of the area is protected as national parks, nature reserves, and in other ways. Geological criteria have, so to say, only been used in subordinate clauses.

One exception is the just recently approved Festningen Geotope Conservation Area, where geological criteria were the main criteria. One of the main geoelements of the conservation area is the so-called "Festningen section", an almost continuous stratigraphic section through the entire geological record from the late Permian to the early Tertiary. It was described in great detail in the early part of the 20th century, and has been used by many geologists as a stratigraphic reference section for their work in other parts of Svalbard.

As a paradox, geologists were the first ones to react against the initiative. While the main intention behind protecting the site was to prevent any sort of future mining activity, infrastructure development or deposal, geologists were afraid that giving the place a protected status would develop inconvenient bureaucratic obstacles for scientists. Rumors occurred that there would be restrictions in sampling the section, which would devaluate its function as a stratigraphic reference section. In reality, protecting the area did not make a significant difference for normal geological fieldwork. The main problem here was that a constructive dialogue between management and scientific community was absent prior to and during the process, and that regulations of what sort of research activities need an exemptional permit are not clearly defined. On the other hand, a standard set of regulations for protected areas is applied, which has nothing to do with the original purpose of protection: to preserve the section for scientific documentation and future research.

Learning from this, it must be strongly recommended to the environmental management to cooperate with the geological community and to establish rules for protected geological objects in a way, which is appropriate for the purpose of the protection.

As a model, we should look at approaches made in Iceland; where in certain cases scientific committees or societies administer protected sites. One of these examples is Surtsey Nature Reserve, a volcanic island which emerged in 1963 off the southern coast. All hu-

Figure 2: Sinter terrace complex of Trollkjeldane, thermal springs, in the Northwest Svalbard National Park. Aerial photo: Winfried Dallmann.

Figure 3: Section of the protected Ilulissat Isfjord, Greenland, a famous ice-filled fiord with an immense production of icebergs. The area is nominated for the UNESCO World Heritage List. The photo shows Eqi (= "corner of the mouth") at the mouth of the fiord, where also archeological sites occur. Photo: Joel Berglund.

man activities there are administered by the Surtsey Society, a combined political/scientific committee. An other example is the Icelandic Speleological Society, which manages access to – and activities in – all protected Icelandic caves. These measures seem to work well.

Although environmental thinking and conservation values count high in Svalbard, there has little action been taken to protect especially valuable types of geoelements independently of geographically defined protected areas. If one finds a thermal spring, a mammal skeleton, a frozen mammoth or a unique crystal cave outside a protected area, the only law protecting it is the general Law on environmental protection of 2002, which admittedly has quite high standards and probably would be sufficient to protect the object. Unless it is found in a private area, for instance where a company has a mining concession.

In Iceland, where geology is much more a part of people's daily life due to active volcanism and earthquakes, environmental law more specifically aims at protecting geotopes and certain types of geoelements. Independent of where they may be found or develop, all volcanic craters, pseudocraters, young lava, stalactite caves, waterfalls, thermal springs, geysirs, salt marshes and tidal flats automatically enjoy a special protection status, as well as freshwater lakes, swamps

and wetlands exceeding a certain size. Some of these are natural environments with a combined geo- and bio-component, some are mainly geological. A total of 33 geoelements are protected according to law as natural monuments; these comprise volcanoes and craters, waterfalls, bare rocks faces with glacial striae, fossil occurrences, caves, cliffs of columnar basalt, and others.

Greenland is politically – although not geologically – a part of Europe and thus the largest land area of the European Arctic. Due to the great importance of Arctic flora and fauna for subsistence and economy of its population, nature conservation has until recently focused particularly on the living resources. Still, a number of protected areas exist, where also geoelements are protected likewise. The world's largest national park was established in North and East Greenland in 1992. A specific protected status of geoelements was established for a few localities between 1998 and 2003, comprising Akilia (cliff consisting of some of the world's oldest rocks), Arnangernup Qoorua ("Paradise Valley", a geomorphologically unique area), Ikkafjorden (up to 18 m high, vulnerable submarine columns of the mineral ikaite), and Ilulissat Isfjord (a famous ice-filled fiord with an immense production of icebergs).

As late as 1 January 2004, a new environmental law was passed in Greenland, where – among others – geological sites achieved a much better consideration. All natural objects, including geological ones, of unique scientific or museal interest are automatically protected. It is prohibited to cause any changes of the natural habitat of and around saltwater lakes and thermal springs. And finally, also Greenland established by law the demand to carry out environmental impact

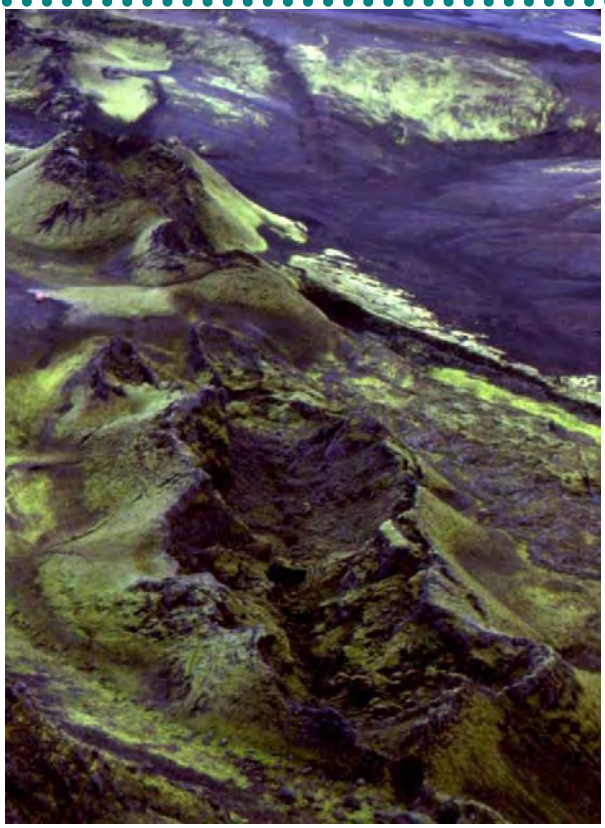

Figure 4: Part of the Laki or Skaftár craters from eruptions in 1783-1784 in southern Iceland, a protected natural monument. Aerial Photo: Ingvar A. Sigurðsson.

assessments prior to any industrial activity, which includes the assessment of impacts on landscape.

Finally, it is worth to know that both Greenland and Iceland each have applied to UNESCO with one of their sites to be included in the World Heritage List: Ilulissat Isfjord in Greenland, and Þingvellir, the famous historical gathering place of the Middle Ages in Iceland. Although the latter is mainly a cultural heritage site, it also contains valuable geoelements. A place on the World Heritage List of either of these Arctic sites would certainly contribute to raise the global awareness for the cultural and natural heritage of the Arctic countries as a whole.

Many thanks to Joel Berglund (Grønlands Nationalmuseum & Arkiv, Greenland), Tom Christensen (Dansk Polarcenter /Grønlands Hjemmestyre / Direktoratet for Miljø og Natur, Denmark), Kristinn Magnússon (Fornleifavernd ríkisins, Iceland), Ingvar Atli Sigurðsson (Náttúrustofa Suðurlands, Iceland), Åsmund Sæther and Kirsti Høgvard (Sysselmannen på Svalbard, Norway) for information used in this article.

Winfried K. Dallmann

European Geoparks Network

Introduction

"Something that is obvious for you is not always obvious for everybody else"

This phrase summarizes the situation in geosciences over the last few decades concerning the topics of geoconservation and geodiversity. Geologists and Earth Scientists in general, often adopted a "Don Quioxte" approach in trying to persuade local communities about the value of stones and rocks. Although geoconservation as a practice has been known in Europe since the nineteenth century, geodiversity does not yet have the awareness or value in the public consciousness we all would like. We would expect that at least in higher technical offices (such as national or global organizations) geodiversity should have some importance, even if it is as part of the natural environment. Its importance is still underestimated and mismatched with respect to biodiversity, although "geodiversity is the link between people, landscape and culture; it is the variety of geological environments, phenomena and processes that make those landscapes, rocks minerals, fossils and soils which provide the framework for life on Earth (Stanley 2001)". The situation however that still exists in many organizations is exemplified by Milton (2002): "Diversity in nature is usually taken to mean diversity of living nature…"

However, who has been responsible for this situation? Unfortunately the blame lies largely at the door of the geological community. It is our fault that the value of the abiotic environment is not as obviously important to the wider public as that of animals and plants. The case that "conservation" of "diversity" is the immediate result of the general public's awareness of its value, cannot be adopted for geodiversity. Historically, in ecology, conservation policies for species were adopted as a result of "pressure" of the wider community, which understood the value and the importance of diversity. For geoconservation we therefore have foremost a duty to make obvious to the wider, non-geological community what is obvious to geoscientists. We have to re-build the bridge between our knowledge of the Earth, it's history and it's landscape and the total dependence of modern society upon Earth's natural resources, a link that was known to generations past. It is this "gap" of knowledge and appreciation that catalysed geoscientists in four European territories to revive the "lost" or forgotten awareness of the interdependence of humanity and geodiversity. However this concept was further widened to include terms such as sustainable and local development and by linking these

The Vulkaneifel European Geopark presented on the internet.

terms with geodiversity and tourism, the idea of the European Geoparks Network was formed.

Creation of the European Geoparks Network

Important geological sites (assigned later by UNESCO as geosites) are widespread across the Earth. The evaluation and the characterization of each geosite is the task for scientists who work under different scientific projects. The most organized and globally applied, since 1995, is the IUGS Geosites Project which has the endorsement of UNESCO.

However, prior to the operation of this project, the abundance and importance of geological sites concentrated in particular places in Europe (such as Haute Provence in France, Lesvos Petrified Forest in Greece and Vulkaneifel in Germany) had already resulted in special conservation policies. Strict management bodies were established by law and other declarations to protect, enhance and conserve and sustainably use geological heritage. However the lack of continuing funds and knowledge to support these objectives led the management bodies to develop promotional strategies and tools to achieve their main targets.

Funding from the Leader IIC programme allowed for the first steps to be taken towards the creation of a network of thematic parks under the common theme of using our geological heritage to promote sustainable economic development through the development of tourism. Geoparks therefore do not only produce essential development but can act as developing tools for their whole territory. The birth of European Geoparks Network took place in Lesvos in 2000 by the linking together of the Maestrago Cultural Park in Spain to those in France, Germany and Greece. This was followed in 2001 by the signing of a formal agreement between the European Geoparks Network and the Division of Earth Sciences at UNESCO whereby UNESCO gave the network its endorsement. Also in 2001, these four territories issued an invitation to LEADER-funded zones across Europe to join them in helping to build a dynamic, high quality network of areas that together would bring sustainable economic benefit to their areas through the development of tourism based on their and geological heritage.

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As specified in the Declaration Charter, a European Geopark is not just a collection of geological sites, but is a territory with a particular geological heritage and with a sustainable territorial development strategy. It must have clearly defined boundaries and a sufficient area to allow for true territorial economic development, primarily through tourism. Geological sites must be of particular European importance in terms of their scientific quality, rarity, aesthetic appeal and education value. Sites can not only be related to geology but also to archaeology, ecology, history and culture. All these sites in the geopark must be linked in a network and constitute thematic parks with routes, trails and rock sections that can benefit from protection and management measures.

Geoconservation is implicitly expressed within the Charter of the European Geoparks Network through the strong statement that no destruction or sale of geological objects from a European Geopark maybe be tolerated, except for scientific or educational purposes. Furthermore, a European Geopark has to develop and enhance methods and tools for the preservation and conservation of geological heritage, as well as to support and develop scientific research related to the various disciplines of the Earth Sciences. Education and training on the natural and geological environment comes as a direct consequence of conservation strategies and aims to promote knowledge and value of geological heritage, outlining the concept of geodiversity in the territory.

Sustainable development is considered as an essential practice for economic development in the territory and for the strengthening of the management structure and, therefore, for the Geopark itself. Geological heritage is evaluated and considered from the inhabitants' perspective, presence and needs. The contribution of the Geopark is thus seen through the enhancement and

promotion of a certain image related to the geological heritage and the development of tourism with related actions. This should have a direct impact on the territory influencing its inhabitants' living conditions and environment, lead to a revalidation of the values of the territory's heritage and enforce active participation to the territory's cultural revitalization as a whole.

Finally, a European Geopark has to work within the network for it's further expansion and cohesion, collaborate with other geoparks and local enterprises for the achievement of it's objectives, create and promote new by-products linked with geological and cultural heritage in the spirit of complementarity with the other European Geoparks Network members.

Present state and tools in the Network

At present, May 2004, the European Geoparks Network consists of 17 territories across 8 countries, plus UNESCO. The Network operates through initiating common projects between members that allow all to help realise the Network's overall aims and objectives of promoting geological heritage, geoconservation and sustainable economic development. The Network functions through the work of two committees and one administrative office. The coordination committee consists of two prepresentatives (one from a geological background and one from a management / development background) from each geopark. This committee meets three times per annum and is the only decision-making part of the European Geoparks Network. It is this committee that decides what common projects should be implemented and it is through exchanges within this committee that ideas are transferred from one member to another. It is also the coordination committee that decides on new membership applications and reviews existing membership of territories every three years. In addition the advisory committee consists of 7 individuals whose role is really one of facilitating the smooth work of the coordination committee at meetings by reviewing proposed meeting agendas, and making recommendations on specific topics. IUGS and UNESCO both have a place on the advisory committee and UNESCO alone have the power of veto on any decision the network makes. The administrative office is at the Cellule de coordination du réseau des Geoparks europeens in Digne-les-Bain, France, which receives new applications and deals with all written correspondences. Finally, the network also has two coordinators elected by the coordination committee. Their role is really one of ensuring a continuum of contact among members between meetings and ensuring that the agreed timetable on common tasks is adhered to.

Currently the European Geoparks Network promotes its activities to non-members through a common magazine and a web-site *(www.europeangeoparks.org).* However, these products were produced several years ago and, as the Network currently has no membership fee, funding had to be secured to update them. Last year, the network secured almost €1 million in funding through the INTERREG IIIC programme not only to update these products but also to initiate new ones. The Petrifed Forest of Lesvos European Geopark is the Lead Partner for this project. In addition groups of geoparks are now initiating regional projects of their own all with the aim of promoting geological heritage, geoconservation and sustainable economic develoopemnt through the building of a high quality tourism product. As recently as February 2004, the Marble Arch Caves (N. Ireland), Copper Coast (S. Ireland) and the Vulkaneifel (Germany) together with partner organisations secured over €4 million in funding through the INTERREG IIIB North-West Europe programme with the Geological Survey of Northern Ireland acting as Lead Partner. This project will not only initiate major programmes of geoconservation in each geopark area but will also allow major tourism infrastructure to be developed including new or enhanced visitor centres, new geological trails to be devised and a major joint marketing programme to be implemented. A crucial part of this project is centered on an outreach programme which aims to bring the wonders of our geological heritage to the wider population. Similar projects, both on a regional and network-wide scale, are currently in different stages of formulation.

Co-operation and synergy between the various geoconservation initiatives.

The European Geoparks Network is a very open organisation and is very active in encouraging and attracting new members to join us. Once a year, the Network organises an International Conference where individuals and groups from across Europe can come and exchanges ideas and experience with us, learn about our Network and discuss how to become a member. Moreover, throughout the year, members from the network work tirelessly to help and encourage territories outside the Network to join. As an example, over the last 6 months members of the European Geoparks Network have been working with groups from Greece, Iceland, Ireland, Norway, Romania and United Kingdom with a view to encouraging membership of the Network. On a wider scale, we have also been presenting the Network to the wider global geological community through presentations at conferences such as the Annual Meeting of the Geological Society of America or through links with the IUGS. The European Geoparks Network fully realise that the geological community is a small one and that full cooperation within that community is the best way of allowing us all to realise our aims and objectives with regard to geoconservation and geological heritage. As

such the coordination committee of the EGN includes individuals who are members of ProGeo, geological surveys, universities and professional geologists while both UNESCO and IUGS are represented on the advisory committee. As recently as February 2004, UNESCO launched the Global Geoparks Network to which all 17 members of the EGN were admitted. At that meeting UNESCO reaffirmed its agreement with the EGN and confirmed that geoparks in Europe would only obtain UNESCO endorsement through being active members of the EGN. Finally, the European Geoparks Network initiative is one that could work in great synergy with other geoconservation / geological heritage projects in Europe such as the Geosites project. It is to the benefit of Earth Science as a whole if such synergies could be explored and developed. The measure of our success in all these matters is three fold and will be:

- Whether in ten years time, geoconservation has entered the European public consciousness in the way that bioconservation has
- Whether geological heritage is being actively protected and promoted in our territories and
- Whether the sustainable promotion of that heritage has made a real economic and cultural difference to the local communities in each of our European Geoparks.

C. Fassoulas and PJ Mc Keever *on behalf of the Coordination Committee of the European Geoparks Network*

Diversity in its completeness

The 1st meeting on conservation and sustainable use of geodiversity in Andalucia, was arranged with success 20-22 May 2004 in Almeria, Spain. It was organized by the Government of Andaluzia.

The meeting included two 2 days of constructive meeting sessions with interesting presentations and high quality posters, covering proposals for inventory of geosites and strategy on geoconservation, legislative aspects, sustainable tourism, and communication and diffusion methods, and presentation of selected unique sites.

I was invited to present ProGEO and talk about the past, present and future of geoconservation in Europe. Other invited colleagues were Thomas Hose (Validation and tourism of georesources in rural areas) and Maurizio Burlando (Experiences on geotourism in natural parks in Italy).

A sufficient number of interested persons and the active public participated in the meeting with numerous interventions and substantial discussions. At the end of the meeting I want to congratulate the organizers for their initiative with the following text prepared together with Maurizio and Thomas:

The meeting was well presented in the newspapers.

From the roman Castle in Almeria towards the Harbour.

We were invited to talk about best practices, but we have been privileged to learn from your best practice. - We will take home more than we gave! - The whole work that you do, the diversity of your ideas, the quality and the quantity of your studies, your approaches are most impressive. On behalf of all three of us and on behalf of ProGEO, I would say that you represent a great contribution to the geoconservation community.

We have witnessed:

- *Really very good examples of what Andalucia offers from a geoconservation point of view.*
- *Great enthusiasm by geoconservationists and their supporters working in Andalucia.*
- *Very good impressions of the way in which the project of inventories is working.*
- *The professionalism and high level of materials about promotion and promulgation of the geoheritage of Andalucia.*
- *Very high level of involvement of public administrations in geosite management.*
- *Hence, we are reasonably optimistic for the sustainability of this magnificent initiative of a European dimension in terms of demanded quality*

Irini Theodossiou-Drandaki

Council of Europe recommendations

Recommendation Rec(2004)3 on conservation of the geological heritage and areas of special geological interest (Adopted by the Committee of Ministers on 5 May 2004 at the 883rd meeting of the Ministers' Deputies.
https://wcm.coe.int/ViewDoc.jsp?id=742587&Lang=en

The Committee of Ministers of the Council of Europe,

- Recalling the United Nations' Millennium Declaration, in particular the assertion of the fundamental value of "respect for nature" in the management of all living species and natural resources;
- Recalling that geological heritage constitutes a natural heritage of scientific, cultural, aesthetic, landscape, economic and intrinsic values, which needs to be preserved and handed down to future generations;
- Recognising the important role of geological and geomorphological conservation in maintaining the character of many European landscapes;
- Recognising that the conservation and management of geological heritage need to be integrated by governments in their national goals and programmes;
- Noting that some areas of geological importance will deteriorate if they are not taken into account in planning and development policies;
- Aware of the need to promote the conservation and appropriate management of the geological heritage of Europe, in particular areas of special geological interest;
- Considering the philosophy and practice of geological and geomorphological conservation (see Appendix 1 to this recommendation);
- Recognising the need to strengthen the regional co-operation in Europe in the field of geological heritage conservation,

Recommends that governments of member states:

- identify in their territories areas of special geological interest, the preservation and management of which may contribute to the protection and enrichment of national and European geological heritage; in this context, take into account existing organisations and current geological conservation programmes (see Appendix 2 to this recommendation);
- develop national strategies and guidelines for the protection and management of areas of special geological interest embodying the principles of inventory development, site classification, database development, site condition

monitoring and tourist and visitor management, to ensure sustainable use of areas of geological interest through appropriate management (see Appendix 3 to this recommendation);
- reinforce existing legal instruments or develop new ones, to protect areas of special geological interest and moveable items of geological heritage, making full use of existing international conventions (see Appendix 4 to this recommendation);
- support information and education programmes to promote action in the field of geological heritage conservation (see Appendix 5 to this recommendation);
- strengthen co-operation with international organisations, scientific institutions and NGOs in the field of geological heritage conservation (see Appendix 6 to this recommendation);
- allocate adequate financial resources to support the initiatives proposed above;
- report to the Council of Europe on the implementation of this recommendation five years after its adoption, so that an assessment of its impact may be carried out.

Appendix 1

Philosophy and practice of geological and geomorphological conservation

Geology and geomorphology, as Earth sciences, describe the history and form of our planet. Geology helps us to understand this history in terms of how the face of the planet has changed over time, as traced via the evidence of rocks, sediments in all forms, fossils and minerals that reveal past climates, environments, mountain construction, and continent movement. The history of life itself is also revealed – how it began and evolved, how new species appeared and how species became extinct. Geomorphology interprets the landforms we see today – deserts, glaciers, coastlines and others – and the conditions under which they were formed, and also provides a record of the recent past and current processes operating on our planet.

Rocks, minerals and fossils are the archives of the history of our planet and the history of life itself. They are evidence of the passage of geological time, revealing the changes that have shaped the Earth's surface over millions of years. These archives make it possible for us to understand the way our planet looks today and the diversity of its fauna and flora. As with archaeological artefacts, geological sites, minerals and fossils are vulnerable and are a non-renewable heritage that belongs to humanity.

Human society interacts with geology and geomorphology in many ways: through direct exploitation of mineral resources, through reshaping the landscape by industrial or agricultural activity, and through the development of infrastructure links. In some cases (for example by quarrying, mining, cutting of new roads) these activities reveal geological or geomorphological information of scientific, educational or cultural value. In other ways our activity destroys this information: the removal of glacial landforms for use as building material, armouring (and obscuring) of rock sections on coasts and infilling of old quarries with waste, are all examples of destructive activities.

Europe has a rich geological heritage. The scientific principles that founded the science of geology were developed in Europe, where the varied geology and geomorphology provided an inspiration for original thought. Protecting this heritage is the objective of geological conservation ("geological" being taken here to relate to all branches of geology, including paleontology and mineralogy, as well as all aspects of geomorphology), an activity that works in parallel with the protection of biodiversity and landscapes. The term "geodiversity" has been used to describe the nature of the diverse heritage we are seeking to protect and enhance through this work.

Although not as well developed in practice as biodiversity conservation, and not as well known to the public, geological conservation is being actively promoted in Europe through a number of programmes and the activities of many individuals. The programmes that promote geological conservation seek to identify areas ("sites") of geological or geomorphological interest, educate the public about their value and develop management plans or strategies that will not only protect but also enhance this value. These areas may be natural or man-made. Naturally created features include river gorges, caves, coastal rocks, sand dunes, remnant features of past glaciation, glaciers, arid terrains and volcanic landforms. Man-made features include road cuttings, quarries and waste heaps from mines, which may also be of geological heritage value since they reveal new geological information.

Protection of the European geological heritage in all its forms requires consistent and persistent efforts by governments and non-governmental organisations on a pan-European scale. Programmes exist within Europe to promote the protection of geological and geomorphological features and the heritage values with which they are associated, but there is a need to further develop these programmes and create closer links between them. There is also a need to increase awareness of the importance of geological conservation to allow it to rank alongside and fully support biological conservation. Opportunities now exist to work

towards these aims at European level, via the Council of Europe and the involvement of member states and the various inter-governmental and non-governmental international organisations operating within Europe, such as Unesco, the International Union of Geological Sciences (IUGS), the World Conservation Union (IUCN), etc.

Further Appendicies (see https://wcm.coe.int/ViewDoc.jsp?id=740629&Lang=en) .

List of proposed actions

- Governments of member states should support the work of IUGS, ProGEO, NGOs and other relevant organisations within their areas of jurisdiction, encouraging collaboration with statutory national authorities. In particular, they should support the work of ProGEO working groups to develop pan-European inventories of sites of scientific interest and the creation of associated databases and should seek ways in which to support the new IUGS initiative to promote geological conservation in Europe.
- Governments of member states should work with the European Geoparks programme to identify territories within their jurisdiction that may merit this form of recognition.
- Governments of member states should:
- review the geological heritage of their areas of jurisdiction to identify geological/geomorphological sites of potential World Heritage status and add these to their national tentative lists of potential World Heritage sites;
- ensure that any underlying geological/geomorphological values of importance for a site are made explicit in the nomination documents for cultural and natural World Heritage sites.
- Member states should work with each of these programmes to identify areas of special geological significance and promote their recognition by the most appropriate programme.
- Governments should ensure that the work of these programmes is linked through an appropriate national body to ensure the most effective recognition and promotion of these areas of nature conservation.
- Governments may also wish to recognise that the existing European Diploma of Protected Areas should be used as, or developed into, a model for protecting geological heritage in a European context.
- Governments of member states should develop national guidelines for managing areas of geological interest embodying the above principles of inventory development, site classification, database development and monitoring programmes linked to existing programmes.
- Governments of member states should consider:
- developing and implementing new laws if such areas cannot be protected by existing laws;
- strengthening existing laws to increase protection;
- integrating the legal protection of geological areas of interest into the protection of biodiversity;
- using the existing range of international instruments to protect sites including the World Heritage Convention, the European Landscape Convention and the EU Habitats Directive;
- the implementation of new or existing laws for the protection of areas of geological importance, to be linked to national site inventories and national site databases.
- Governments of member states should review their existing legal and voluntary supervision methods to ensure that moveable geological heritage is protected by appropriate legal means, in the national and international context.
- Governments of member states should promote action in the field of geological heritage conservation by identifying and utilising opportunities to develop and support information and education programmes, both within their own jurisdictions and regionally, acting via the Council of Europe and other relevant international or European organisations.
- Governments of member states should strengthen co-operation with international organisations, scientific institutions and NGOs in the field of geological heritage conservation by encouraging participation by state institutions in the geological conservation programmes identified in this recommendation and promoting collaboration between the relevant institutions and organisations.

Trans-KARST 2004 - International Transdisciplinary Conference on Development and Conservation of Karst Regions

The Organizing Committee of the International Transdisciplinary Conference on Development and Conservation of Karst Regions (Trans-KARST 2004) has the pleasure of inviting you to participate in this conference, which will take place in Ha Noi, Vietnam from September 13 - 18, 2004.

Trans-KARST 2004 will:

- Offer a forum to discuss basic and applied research findings and methodologies which can contribute to the management and development of karst areas;
- Help strengthen interest in the preservation of geodiversity, biodiversity and cultural diversity through promotion of sustainable relationships between them;
- Stimulate communication between researchers, practitioners and policy makers working in karst landscapes;
- Explore ways to integrate natural and social sciences approaches in the management of karst systems.

The Conference will be organized around 4 major themes; each refers to a set of issues of particular relevance to or concern for the development and conservation of karst regions.

The first theme - Policy and management of land and water resources - includes such topics as balancing public and private responsibilities; reconciling economic development and nature conservation in land-use planning; the technical and social requirements for water supply, soil conservation and flood protection etc.

The second theme - Development of infrastructure and assessment of environmental risks and hazards - includes such topics as karst dissolution and collapse; the effects of climate change; flooding, flood controls and dam construction; environmental mitigation of infrastructure development; managing pollution of water resources in karst systems; monitoring karst water resources; karst structure, groundwater modeling and hydrological cycles; water tracing and vulnerability mapping; cave exploration and structural geology etc.

The third theme - Conservation of eco-systems - includes such topics as managing tourism in sensitive areas; developing and protecting show caves; cave exploration; conserving karst specific biodiversity; biodiversity quantification and monitoring; sustainable forest management; impacts of land-use changes on cultural heritage and landscape; environmental impact and mitigation assessment etc.

And the last theme - Integration of natural and social science approaches - includes such topics as transdisciplinary research collaborations; multi-stakeholder collaboration in policy and practice; education and social learning; participatory research methodologies; social and geoscientific applications of GIS and remote sensing.

We look forward to welcoming you to Ha Noi, Vietnam and to the Trans-KARST 2004.

Registration deadline: June 30, 2004

After April 30, 2004, the registration rates are:

- US$200 for a foreign participant, or US$30 for a participant from non-OECD countries
- US$150 for a foreign accompanying person/student, or US$15 for a accompanying person/student from non-OECD countries

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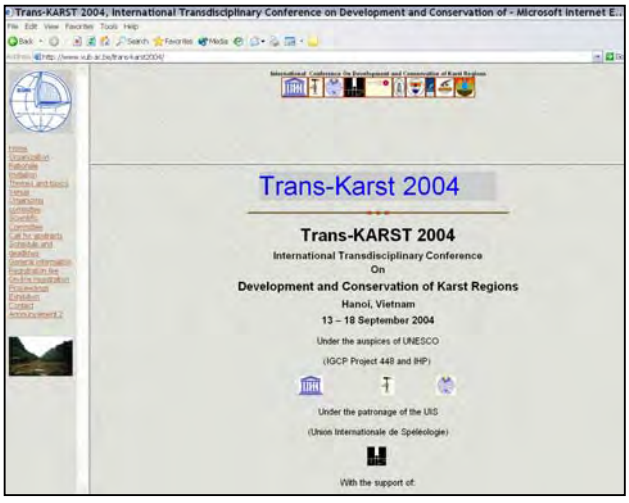

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