EUROPEAN GEOPARKS NETWORK

European Geoparks Magazine ● Issue 15

Geoparks
and sustainable development

THE EUROPEAN GEOPARKS NETWORK

www.europeangeoparks.org

2018

20th – 22nd March 2018: 41st European Geoparks Network Meeting
Karawanken/Karvanke UNESCO Global Geopark, Slovenia & Austria

22nd April 2018: International Earth Day
Geopark Activities

28th – 30th April 2018: International Meeting & Workshop on UNESCO Global Geoparks, Queshm Island UNESCO Global Geopark, Iran

17th - 18th May 2018: 1st International Conference, UNESCO Global Geoparks in Greece and Cyprus "Geological heritage protection and management, education, sustainable tourism and local development", Athens, Greece

25th May – 10th June 2018: European Geoparks Week

7th - 17th June 2018: International Intensive Course on Geoparks UNESCO Global Geoparks and Geoheritage management, Lesvos Island UNESCO Global Geopark, Greece

8th – 10th September 2018: 42nd European Geoparks Network Meeting

11th – 14th September 2018: 8th International Conference on UNESCO Global Geoparks – 2nd Ordinary GGN General Assembly, Adamello Brenta UNESCO Global Geopark, Italy

13th October 2018: International Day for Disaster Reduction
Geopark Activities

11th December 2018: International Mountain Day
Geopark Activities

2019

March 2019: 43rd European Geoparks Network Meeting, Swabian Albs UNESCO Global Geopark, Germany

September 2019: 44th European Geoparks Network Meeting

September 2019: 15th European Geoparks Conference, Sierra Norte de Sevilla UNESCO Global Geopark, Spain

2020

March 2020: 45th European Geoparks Network Meeting, Papuk UNESCO Global Geopark, Croatia

September 2020: 46th European Geoparks Network Meeting, Hateg UNESCO Global Geopark, Romania

September 2020: 9th International Conference on UNESCO Global Geoparks – 3rd Ordinary GGN Association General Assembly

European Geoparks

European Geoparks Network Magazine

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Cover photo: Adamello Brenta UNESCO Global Geopark: A man and his little children walking on the roche moutonnee of Adamello group with the Brenta Dolomites in the back
Photo by: Adamello Brenta UNESCO Global Geopark

GEOPARKS: Conserving, educating and promoting sustainable development

The many activities and achievements of the European Geoparks Network (EGN) during 2017 include the very successful EGNAZORES2017 - 14th European Geoparks Conference (Azores, Portugal) attended by 370 delegates from 36 countries. The Magazine also extends the invitation from Adamello Brenta UNESCO Global Geopark, Italy to attend the 8th UNESCO Global Geoparks Conference in September 2018. In 2017 the EGN added Causses du Quercy UNESCO Global Geopark, France, and LasLoras UNESCO Global Geopark, Spain, as new Geoparks to its list of members.

In this issue, articles about Geoparks Week, the presence of UNESCO Global Geoparks at the International Tourism Fair Berlin 2017, the International Year of Sustainable Tourism Development and Thematic Working Groups highlight achievements by Geoparks working together. *The effects of the UNESCO Global Geoparks in Europe*, the Abstract for a Masters Thesis, from the University of Cergy-Pontoise (Paris Region, FRANCE), demonstrates that Geoparks are now considered as subjects for academic study.

Thirty four articles show how European Geoparks contribute to conservation, education and promoting sustainable development through geotourism. They highlight that sharing information and working with communities, businesses and educational establishments safeguards sustainable development in Geoparks, at times supported by European funding. The importance of ensuring access to Geoparks by improving and/or developing geotrails and enhancing their geotourism provision through published guides and digital communication is emphasized in contributions by Bauges, Cyprus, Lanzarote and Rokua UNESCO Global Geoparks. Bakony-Balaton Geopark adds the first geological guide map in Hungary to its tourism provision. Vikos Aaos Geopark is involved with the development of the Epirus Trail, regarded as a high priority project.

The appreciation and celebration of a Geopark's heritage, including its potential as a contribution to geotourism, is highlighted in contributions by Beigua and Fforest Fawr Geoparks. Geopark Chablais promote their geoheritage by devising a 2-day treasure hunt with the Portes du Soleil, French Swiss Association. Reykjanes Geopark has raised its profile as a geotourism destination by telling good stories about the region's natural environment, history and people. Geopark Harz. Braunschweiger Land. Ostfalen improved its visibility by placing steles in locations visible to motorists and pedestrians. Terras de Cavaleiros Geopark has a project to safeguard the territory's cultural heritage. Ancient gold mining in Naturtejo Geopark is celebrated with a new Information Centre and an exhibition. The Northwest Highland Geopark uses the Geopark brand in conjunction with its activities as a driver for growth. Hateg Country Dinosaurs Geopark and Lesvos Geopark promote Geoparks internationally through a touring Geopark mascot and a travelling exhibition respectively.

All Geoparks engage in formal and informal educational projects. The Basque Coast Geopark describe a new and pioneering initiative titled 'Geo-Talks: Science, Culture and Fun'. Idrija Geopark's ESTEAM project contributes to Natural Science education by developing an eBook. The UNESCO-EDU Sardinia, the Sesia – Val Grande, Rokua Geoparks' student exchange project and developing Geopark Schools in the Swabian Albs Geopark highlight the important contribution Geoparks make to education.

The contribution of European funding for collaborative projects is described by Burren and Cliffs of Moher, Idrija and the Tuscan Mining Geoparks. Nature and Geopark Styrian Eisenwurzen hosted the successful meeting of the Interreg Danube GeoTour Project involving eleven project partners from eight countries.

An increasing involvement in arts projects, highlighted in the contributions by Bergstrasse-Odenwald, Central Catalonia and Ore of the Alps Geoparks, introduces the Geopark concept to a wide audience.

Pollino Geopark Italy celebrates the designation of the Ancient Beech Forest of Cozzo Ferrerio in its territory as a UNESCO World Heritage Site in 2017.

Scientific research and geo-conservation are pursued by all Geoparks. The Carnic Alps Geopark describes the fossilization of a Silurian cephalopod *Orthoceras*. The Madonie and Molino Alto Tejo Geoparks highlight stratigraphically important geosites. Geopark Shetland is involved in the restoration of peatland and Vulkaneifel Geopark has created a managerial post to address climate change and biodiversity. Magma Geopark describes the restoration of a vandalized natural monument in its territory.

EGN AZORES 2017

14th European Geoparks Conference (Azores, Portugal)

Three hundred and seventy participants from 36 countries from all around the World met at the "Teatro Micaelense - Cultural and Conference Centre".

The Azores UNESCO Global Geopark (Portugal) hosted the 14th EUROPEAN GEOPARKS CONFERENCE from 7th to 9th September 2017, under the theme "*GEOPARKS: PATHWAYS OF SUSTAINABLE TOURISM FOR DEVELOPMENT*". A total of 370 delegates attended the conference, coming from 26 European countries (85%) and also from Australia, Brazil, Canada, China, Colombia, Ecuador, Iran, Japan, Mexico and the USA.

During the two day meeting (September 7th and 9th), 125 oral presentations and 40 *i-posters* (e.g. TV screen posters) were presented in the "Teatro Micaelense - Cultural and Conference Centre", in Ponta Delgada city (S. Miguel Island). The conference focused on the following themes: Geoparks and Sustainable Tourism; Conservation, Science and Research; Education, Public Awareness and Communication; Good Practices in Geoparks; Engaging Communities and Networking; Aspiring Geoparks.

In addition, during these two days a series of seven oral presentations were delivered and discussed under the umbrella of the two workshops "GEOPARKS & GEOTOURISM IN VOLCANIC AREAS" and "GEOHAZARDS IN GEOPARKS", chaired by the coordinators of the Global Geoparks Network Working Groups.

A mid-conference field trip (MCFT) took place on September 8th, allowing all delegates, accompanying persons and volunteers contributing to the organization of the conference to discover and enjoy the volcanic landscapes, geology, cultural sites, people and traditions of São Miguel Island. The MCFT included a choice of three field excursions:

- MCFT 1 "*Feel and taste the S. Miguel volcanoes*", with stops at the Caldeira Velha thermal area, the Fogo Volcano caldera, the Pico do Ferro viewpoint

The EGN AZORES 2017 Conference included several social and cultural events, including the "Icebreaker" on the evening of September 6th, with the performance of the traditional Azorean music and dance group of Domingos Rebelo High School.

Participants on the Mid-Conference Field Trip *"...deep blue and coloured greens"* at one of the most iconic geo-landscape of the Azores UNESCO Global Geopark, the Sete Cidades Volcano caldera and its poetic lakes.

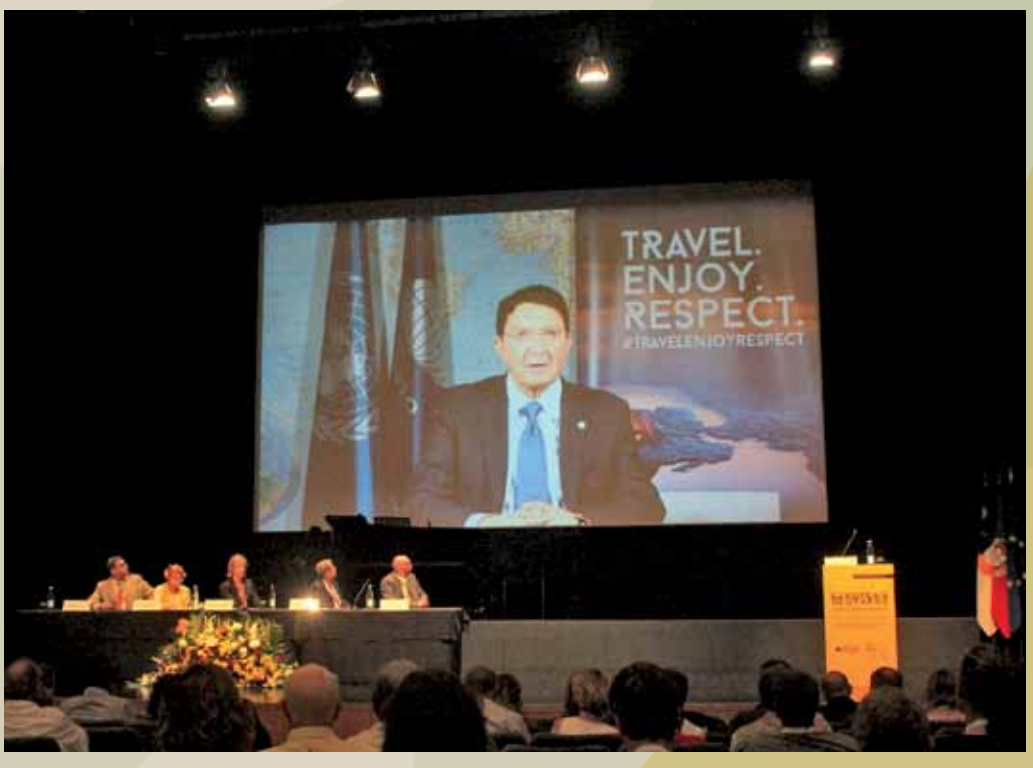
(over the Furnas Volcano caldera) and the Furnas geosite of international significance, including its lake, fumarolic fields and the Azores Geopark Island Delegation;

- MCFT 2 "*...deep blue and coloured greens*" that included a geological interpretation of sea cliffs, a dolphin & whale watching cruise, and a bus tour with stops at Ponta da Ferraria geosite, the Lagoa do Canário viewpoint (over the Sete Cidades Volcano caldera) and the Ribeira Seca volcanic memorial;
- MCFT 3 "*Geocultural landscapes*", with stops at the Carlos Machado Museum (Natural History section), pineapple greenhouses, the frontage and cannon ball impact at the Vila Franca do Campo ignimbrite´s church, and the Vista do Rei viewpoint (over the Sete Cidades Volcano caldera and its poetic lakes).

The post-conference fieldtrips (PCFT) were organized from 10th to 13th September. Sixteen delegates participated in the fieldtrip"*...from majestic volcanoes to great people*" on the Faial, S. Jorge and Pico islands. Twenty six delegates chose to participate in the fieldtrip "*...islands of fire and water*" on the Flores and Corvo islands.

A series of social and cultural events were also organized during the EGNAZORES2017 Conference, in collaboration with the stakeholders of the Azores UNESCO Global Geopark and the local population. The accompanying persons experienced a special programme, including a city tour of Ponta Delgada, a visit to cultural and architectural sites at Ribeira Grande city, a walking trail and swimming in the sea!

Volunteers from Portugal, Italy, Brazil, Switzerland, USA, Greece, Croatia and Hungary were very supportive and key partners in the management of the conference.



The Director General of the World Tourism Organization Mr T. Rifai delivered a message at the opening ceremony of the 14th European Geoparks Conference held in Azores UGG.

The opening ceremony of the EGNAZORES2017 Conference, which was live streamed on the conference Facebook page, included a musical performance by the "Conservatório Regional de Ponta Delgada", the regional music school in Ponta Delgada. Under the direction of Ana Paula Andrade (piano), a vocalist, violin, cello and local guitar students and invited artists presented several Azorean traditional and popular songs and the music "ILHAS DE BRUMA", the hymn of the Azores Geopark. The lyrics of this hymn are truly a "geo-poem" about the Azorean Man, with the words: *Because black basalt flows into my veins / And in my memory volcanoes and earthquakes.*

Under the umbrella of the EGNAZORES2017 Conference a series of relevant and additional events took place:

- The EGN Advisory Committee Meeting on September 5th and the 40th Meeting of the EGN Coordination Committee on September 6th at the Azores University;
- Closed meetings of the GGN Working Group "Geoparks on Volcanic Areas" and Geopark Evaluators;
- The "(GEO)FAIR AZORES 2017", to promote European geotourism and draw attention to the importance of this tourism product worldwide, with 20 stands at the "Pavilhão do Mar" Exhibitions Centre involving European countries with UNESCO Global Geoparks, and representatives of the Asia-Pacific and the Latin American & Caribbean Geoparks Networks;
- The launch of the special stamps edition "Geoparque Açores" produced by the Portuguese post company (CTT – Correios de Portugal S.A.) in close cooperation with the Azores UGG, with 6 stamps illustrating iconic geo-landscapes of The Azores Islands and their geosites of international relevance;
- The welcome of conference delegates to the EGNAZORES2017 by a group of 20 children from the CATL "Cantinho da Luz", a centre for child support and social inclusion, by courtesy of the "Casa do Povo de Fenais da Luz" Institution;
- The opening session included a video message addressed to delegates by Mr. Taleb Rifai, Secretary-General of the World Tourism Organization (UNWTO)

The Advisory Committee of the European Geoparks Network met in the Azores UNESCO Global Geopark on September 5th.

In the aftermath of the 14th EUROPEAN GEOPARKS CONFERENCE the Conference Chair and the Organizing Committee wish to thank all delegates for their participation in the EGNAZORES2017 Conference and associated events and were honoured by their presence at the Azores UNESCO Global Geopark.

The Conference Book of Abstracts is available on the website www.egnazores2017.com and the authors of oral and poster presentations are welcome and encouraged to submit a paper to a Special Issue of "GEOSCIENCES", an international peer-reviewed open access quarterly journal published by MDPI (Switzerland) which is dedicated to the conference.

A provisional study on the economic impact of the EGNAZORES2017 Conference indicates that the conference contributed about 350,000 Euros to the local Azorean economy.

João Carlos Nunes
Conference Chair
(Photos by Organizing Committee)

Thematic Working Groups in the European UNESCO Global Geoparks Network

Members of the Fossil Working Group at the 40th European Geoparks Coordination Committee Meeting in the Azores UNESCO Global Geopark.

The global community of geoparks is growing – the family is becoming larger with new members in new countries and different parts of the world. The name of this family, the Global Geoparks Network (GGN), emphasizes the most important activity – networking. From the beginning – with four founding geoparks – it was clear that members should *collaborate with each other on a bilateral or multilateral basis, through the organization of common activities, exchange of knowhow, twinning agreements, common publications, presentation of geotourism initiatives and local products etc.* (EGN Operational Rules 2016). However, a steadily growing family has to find practical ways to carry out active networking; the thematic working groups are arenas for such collaboration.

Thematic networks have operated within the EGN for several years and were formed in response to the need to strengthen collaboration between geoparks from different areas. The basic idea was to form networking groups based on geological features or other characteristics from each geopark which could result in the development of common activities or promotional tools. It was clear that the results should reflect the main issues for geoparks, namely to promote and demonstrate the connection between their territories and human activities. Working groups should convene during the EGN Coordination Committee (CC) meetings and report, on progress and results during the following meeting. Working groups on fossils, ice-age geoparks, volcanic geoparks, coastal geoparks and mining heritage geoparks were among these initial working groups. In recent years an obvious requirement for the development of additional working groups to include intangible heritage, natural hazards and on the UN sustainability goals was recognized.

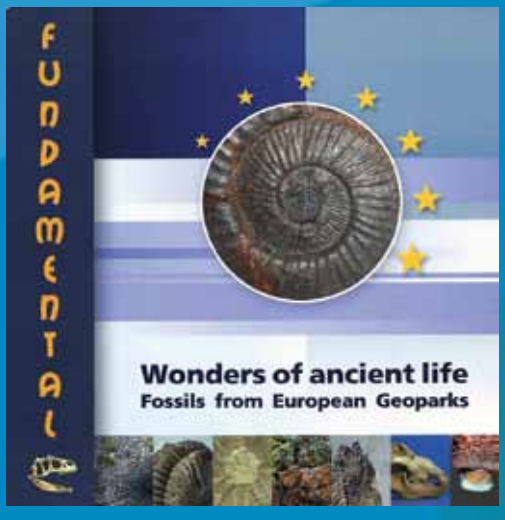
The EGN working groups are also active components of the GGN as stated in the Internal Rules and regulations: *GGN Working Groups are so called Technical Committees and shall have members of a broad geographical distribution. Such working groups should act as coordinator of activities at the global level, coordination of exchange of ideas and best practices, proposal of new regulations and concepts. The GGN working groups should encourage activities through working groups on a regional level.*

Reporting results is an important part of the work completed by the different working groups. Dissemination of good ideas and sharing examples of best practice are dynamic tools for improving geopark activities. These can be communicated through the GGN Website, regional websites, the EGN Magazine and Newsletter and through oral or written reports during EGN and UNESCO Global Geoparks meetings. Some working groups have also been requested to organize workshops during conferences or connect their activities with worldwide issues such as the UN International Day for Disaster Reduction.

Nature and results from the EGN working groups.

Currently the active working groups in the EGN include:

- EGN National Fora/Committee Group
- Funding Group
- Volcanic Group
- Fossil Group
- Mining Group
- Coastal Group
- Intangible Heritage Group
- Education Group
- Natural Hazard Group
- Agenda 2030 and 17 SDG's Group (Sustainable Development Goals)



The Fossil Group's 2014 publication, Wonders of ancient life, Fossils from European Geoparks, promotes the palaeontological values of European Geoparks.

The cover of the Mining Group's cartoguide describing the mining heritage in eighteen geoparks.

National Fora / Committees Working Group
Each national forum/committee provides a report to the EGN before every CC meeting and a summary of these reports is usually part of the working group meetings. The organization of the national fora within each country is decided by the individual member states. An overview of the national structure and how each group functions is also included in the CC meeting agenda.

The working group meetings are good occasions to discuss the challenges experienced by each forum/ committee. This exchange of experience and knowledge is an important part of the life of an active network, especially for newly established members.

The Funding Group is linked to the GGN task force for funding. Strengthening the GGN economy is important for developing common promotional tools and activities and for administering and ensuring the future growth of the network. Consequently this newly created working group is concerned with exploring ideas for raising funds for the network. It is essential that this group shares experiences and works together with the planned Marketing and Tourism Working Groups.

The Volcanic Group consist of geoparks that are volcanically active, have young volcanic rocks covering large parts of their territory or have singular and outstanding volcanic or subvolcanic landforms suitable for interpretation for the general public. For Geoparks situated in active volcanic areas the need to fulfil the demands of living with active volcanoes requires working closely with the local population to disseminate information and deal with issues such as risk mitigation. During the EGN Conference in Azores, September 2017, this group was involved in a special session, *Geoparks and geotourism in volcanic areas*.

Currently members of the Volcanic Group are occupied with producing an e-book called "Volcanic Geoparks in Europe". The plan is to publish the book on the EGN website with a downloadable and printable version for use in schools or for other user groups.

The Fossils Group has already produced the book "Wonders of ancient life. Fossils from European Geoparks". The main objective for further contributions from this group is to promote the palaeontological values in the EGN through a new book, tentatively entitled "Geobiological history of Europe as depicted in the European Geoparks".

The book will have contributions from about 40 European Geoparks.

The Mining Group, this large group involves several geoparks with a mining heritage. It is not only concerned with geology and mining techniques, but also includes traditions, culture and the development of civilizations.

Common promotion is a key word also for this group and they are working on a cartoguide describing all the aspects of this special heritage. This cartoguide will also be published as an electronic version on the EGN website.

The Coastal Group is using common promotion tools mainly to develop tourism in geoparks in coastal areas. However, general information about UNESCO Global Geoparks will be included in the final products.

The soon to be launched first product is a slide show suitable for presentation on YouTube and other social media. All geoparks should provide images from their geopark which include stunning views and local activities.

The Intangible Heritage Group is concerned with myths and stories linked with features in the landscape or geological structures and formations and in promoting intangible heritage in geoparks. Legends involving nature are the origin for many of the world's place names. This group is in the process of developing a model for identifying, collecting, using and promoting the intangible heritage in geoparks. Another task is the identification of local names related to geological features and discovering the stories behind these names. In addition the knowledge about using traditional construction methods and materials, for example in building dry stone walls or stone buildings is also important. The information collected will be added to a database creating a resource which can be used to develop future partnerships and in educational and cultural programmes. The information collected can also be integrated in geotourism products, in training local guides and as components in guided tours.

The EGN Natural Hazards Group is an active participant in discussions with the GGN Geohazards Working Group and has contributed to the development of an action plan for future activities. The group is also engaged in the International Day of Disaster Reduction, registering and reporting activities in all European Geoparks on this important UN thematic day. The report

Members of the Education Working Group at the 40th European Geoparks Coordination Committee Meeting.

will also include activities from other regional networks and will be published in the GGN Newsletter.

The working group arranged a special session on Geohazards Mitigation (Geohazards in Geoparks) during the EGN Conference in Azores in which three presentations were delivered.

The group is now concentrating on developing an action plan that will define activities to undertake during 2018.

The Group on Agenda 2030 and Sustainable Development Goals is one of our "youngest" working group and it is necessary that UNESCO Global Geoparks should contribute to progressing the seventeen UN Sustainable Development Goals (SDG). Many of the SDGs are involved in the areas in which geoparks are working, and some which are more concerned with awareness might contribute to new activities and developments in geoparks.

The SDGs are concerned with our common responsibility for Mother Earth and awareness of her well-being and the well-being of her inhabitants. The group will collect data from the geoparks concerning their perception of the importance of the SDGs for geoparks and also how geoparks should engage with the SDGs. Information will also be received through the activity reports from the national fora. How geoparks engage with the SDGs should also be part of the biannual report to the EGN. The group is also planning a special session during the 8th International Conference on UNESCO Global Geoparks in 2018.

All the working groups engage with different aspects of geoparks but their strategies, activities and outcomes are best expressed by the word COMMON. Irrespective of whether the outcomes are concerned with for example responsibilities for promotion, communication, geotourism and sustainable development in individual geoparks, they are about UNESCO Global Geoparks and our shared values. As we become a bigger family working groups will be an increasingly important part of belonging an active network doing exactly that - networking for greater achievements.

Kristin Rangnes
(Treasurer GGN, Vice Coordinator EGN,
Gea Norvegica UNESCO Global Geopark.

EGN Working Groups

- EGN Geohazards thematic working group
- EGN Volcanic areas thematic working group
- EGN Fossil thematic working group
- EGN Mining thematic working group
- EGN Coastal thematic working group
- EGN Intangible Heritage working group
- EGN working group on Sustainable Development Goal's
- EGN working group on Education
- EGN working group on Tourism
- EGN / GGN Funding working group
- EGN working group on Natural Hazards

Under the patronage of UNESCO

United Nations Educational, Scientific and Cultural Organization

GLOBAL GEOPARKS NETWORK

Geoparks

UNIVERSITY OF THE AEGEAN DEPARTMENT OF GEOGRAPHY

NATURAL HISTORY MUSEUM OF THE LESVOS PETRIFIED FOREST

International Intensive Course on UNESCO Global Geoparks 2018

"UNESCO Global Geoparks and Geoheritage Management"

JUNE 7-17, 2018, LESVOS ISLAND – GREECE

UNESCO, and the Global Geoparks Network are co-organizing the 10th session of the International Intensive Course on Geoparks 2018 "UNESCO Global Geoparks and Earth heritage management".

The course is organized by the University of the Aegean – Department of Geography and the Natural History Museum of the Lesvos Petrified Forest, in Lesvos Island – UNESCO Global Geopark, North Aegean Region, Greece, one of the first Global Geoparks in the world.

The course will take place from June 7th to 17th June, 2018.

The Intensive Course on Geoparks 2018 aims to focus on the UNESCO Global Geoparks contribution on shared and sustainable outcomes related to Earth heritage protection, conservation and management – tying sustainability together with community pride and benefit, economic development and new employment as well as holistic territorial identity promotion.

UNESCO Global Geoparks, through broad stakeholder engagement, celebrating the UN Sustainable Development Goals, provide a global platform of cooperation for Earth heritage management supporting sustainable local development, local communities cohesion and development world-wide.

Through the Intensive Course on Geoparks 2018, the annual capacity building activity of the Global Geoparks Network, attendees will have the opportunity to widen their knowledge and expertise on UNESCO Global Geoparks and Earth heritage protection, conservation and management as a tool for sustainable tourism development, to cooperate with different disciplines and countries.

The Intensive Course on Geoparks 2018 comprises a theoretical background together with extensive fieldwork.

The main activities of the Course include:

- pre-lectures activities which will take place through an e-class on May 30th 2018 and distribution of the latest documents regarding Geoparks and Earth Heritage Management,
- 11 days – 80 hours 'hands on programme' delivered as follows: 40 hours lectures by top UNESCO and Global Geoparks Network experts, as well as specialists in Earth heritage management in theory and practice and 40 hours field training and activities.
- an Activity Report, long distance assisted work, which will take place after the end of the course.

The course is open to Geopark staff members, geoscientists, local development professionals and students involved in geo-education in relation with geo-conservation, popularization of Earth sciences, geopark management, geotourism and sustainable development of rural areas.

Those who are interested in participating in the course are invited to submit the respective application form accompanied by a short CV and an abstract (one page) of their presentation, which they will present during the course.

ECTS Credits Participants will gain 5 ECTS credits after successful completion of the Intensive Course on Geoparks.

United Nations Educational, Scientific and Cultural Organization

Lesvos Island UNESCO Global Geopark

Application deadline: May 10th, 2018

Further information: http://www.petrifiedforest.gr/geoparks2018/

Interreg Ελλάδα-Κύπρος Ευρωπαϊκό Ταμείο Περιφερειακής Ανάπτυξης

The International Year of Sustainable Tourism for Development:

Activities, Projects and success of the UNESCO Global Geoparks in Europe

UNESCO Global Geoparks Booth at ITB Berlin.

The United Nations (UN) designated 2017 as the International Year of Sustainable Tourism for Development. In this context, the European Geoparks Network decided to become a Silver Partner in this project. Subsequently the Global Geoparks Network became a Gold Partner in the UNWTO, the United Nations World Travel Organization. The aim of this close cooperation was to promote the potential of UNESCO Global Geoparks as sustainable tourism destinations between decision-makers and the general public.

Geoparks develop and implement sustainable tourism through their rich geological heritage, natural and cultural resources, networking activities, stakeholder support, education projects and by creating a regional identity. Raising the profile and visibility of geoparks amongst the main tourism players was one of the main objectives for their participation in world tourism fairs like FITUR (Madrid, Spain), ITB (Berlin, Germany) as well as two International Geotourism Fairs (Ponta Delgada, Azores UGGp and Zhijindong Cave UGG). Amongst the UNESCO Global Geoparks, a series of special events was developed for inclusion in the UNWTO website, accompanied by a special issue of the European Geoparks Newsletter, where 24 European

Press Conference on UNESCO Global Geoparks as sustainable tourism destinations at ITB Berlin.

International Seminar in Seville. The representatives of UNESCO Mrs Katriene Heirman, the President of GGN Prof. Nickolas Zouros and the General Directors of Quality, Innovation and Tourism Promotion of the Junta de Andalucía Ms Carmen Arjona and Natural Resources Management and Protected Areas in Andalusia Ms Javier Madrid at the seminar in Ceville with the coordinator of the meeting Ms Antonio García Jiménez, Sierras Subbeticas UUGp.

Geoparks from 16 countries presented their latest projects and developments in sustainable tourism. These include the International Seminar on Sustainable Tourism and Geoparks organized by the Andalucía Government and the three Geoparks in Seville, Spain, Conferences on Sustainable Tourism (Terras de Cavaleiros and Naturtejo, Portugal) the retention of certification for the European Charter for Sustainable Tourism (Adamello Brenta, Italy), a JAKOB-Award for quality and excellence of tourism provision in the Alps-Adriatic region (Karavanke, Austria/Slovenia) and a UNESCO Global Geopark Presentation during the "Green Week in Berlin" (Vulkaneifel,, Germany). Other geopark activities included tourism training courses and information provision for stakeholders, ambassadors and supporters of the Geoparks (Arouca, Portugal; Bergstrasse-Odenwald, Germany; Fforest Fawr, UK; Styrian Eisenwurzen, Austria) and the development of new tourism facilities and activities (Chelmos Vouraikos, Greece; Hondsrug, Netherlands; Idrija, Slovenia; Lesvos, Greece; Magma, Norway; Marble Arch Caves, Northern Ireland/Ireland; Muskau Arch, Germany/Poland; Sobrarbe-Pirineos, Spain; Swabian Alb, Germany; TERRA.vita, Germany; Troodos, Cyprus; Vikos-Aoos, Greece).

The general range of activities in the European UNESCO Global Geoparks were addressed during the 14th European Geoparks Conference in Ponta Delgada (Azores UNESCO Global Geopark) and delivered in oral presentations, posters and through the above mentioned Geotourism Fair, where the UNESCO Global Geoparks from Europe, China and Japan showed their potential for sustainable tourism.The highly successful cooperation between the UNESCO Global Geoparks and the International Year of Sustainable Tourism for Development raised awareness of geoparks and the holistic geopark concept, strengthened networking activities within and between geoparks and their partners - and last but not least - created new sustainable tourism developments in UNESCO Global Geoparks all over the world and, by mobilizing stakeholders, making tourism a catalyst for positive changes in their territories, and in contributing to the UN's Sustainable Development Goals 2030.

Jutta Weber

Public Geoparks Fair at the Annual Conference of the UNESCO Global Geoparks in Europe at Azores UNESCO Global Geopark.

The International Year of Sustainable Tourism for Development:

UNESCO Global Geoparks International Tourism Fair Berlin (ITB) 2017

The UNESCO Global Geoparks stand at the International Tourism Fair (ITB), Berlin 2017.

For the first time since the International Geoscience and Geoparks Programme was established the Global Geoparks Network (GGN) has presented this new UNESCO label at ITB, 2017. Directly after the official press conference of ITB, about 100 journalists and media representatives participated in the GGN the press conference.

Following his welcome, Professor Dr. Nickolas Zouros, President of GGN, gave the floor to Dr. Margarete Patzak, UNESCO Division of Ecology and Geo-Hazards, Dr. Marie-Luise Frey (GGN Executive Board) and Julia Boutron, UNESCO Global Geopark Haute Provence, France, to present the new video of the GGN as contribution by the GGN members to the International Year of Sustainable Tourism (IYST). Guy Martini, director of the UNESCO Global Geopark Haute Provence compiled and produced this video with Julia Boutron.

Besides the press conference, UNESCO Global Geopark members presented their tourism products under a common stand in Hall 4.1.b –Adventure Travel, Responsible Tourism. The stand was organized by the UNESCO Global Geopark Naturtejo (Portugal) for the participating UNESCO Global Geopark exhibitors from Hondsrug (Netherlands), Karawanken (Austria/Slovenia), Lesvos (Greece), Odsherred (Denmark), Villuercas (Spain) and five German UNESCO Global Geoparks: Bergstraße-Odenwald, Harz-Braunschweiger Land-Ostfalen, Muskau Arch, TERRA.Vita and Vulkaneifel and the UNESCO WHS Messel Pit, Germany. They all presented and promoted their new tourism offers during the professional days and at the weekend for potential visitors.

Numerous delegations from different regions of Europe, e.g. the Secretary of Tourism and the President of Tourism of Portugal, interested tour operators and media representatives, e.g. Square Rock, London UK or the Marco Polo, Germany, have shown their interest in the offers and activities of the GGN members. The president of the Global Geoparks Network Association, Nickolas Zouros and Margarete Patzak gave interviews on the new label for "UNESCO Global Geoparks", on its aims and the activities of its 127 members. Nickolas Zouros also introduced the UNESCO Global Geoparks in the 12th Pow-Wow for Tourism Professionals, an open conference dedicated to present innovative tourism destinations or practices.

The GGN in ITB 2017

Watch the video

https://www.youtube.com/watch?v=AZeOSUqVeNQ

GLOBAL GEOPARKS NETWORK

2017 INTERNATIONAL YEAR OF SUSTAINABLE TOURISM FOR DEVELOPMENT

Gold Partner

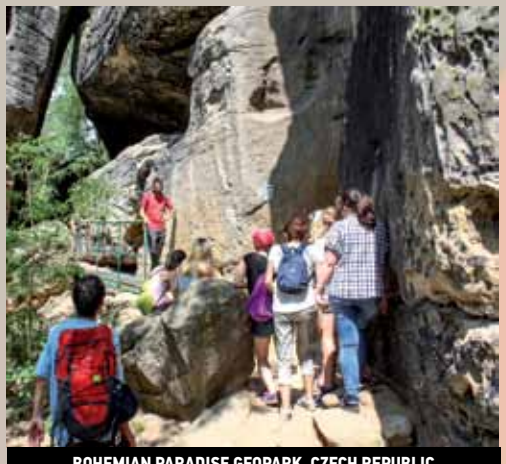
Delegates meet with the hosts from the UNESCO Global Geoparks stand.

In 2017 tourism companies from 5 continents and 180 nations visited ITB. More than 10,000 exhibitors presented their products in an area of about 160,000 square metres. 28,000 participants were registered for the ITB congress during the fair. Over 109,000 experts visited ITB 2017. The ITB organization recorded a turnover of 7 billion Euro.

Professor Nickolas Zouros in discussion with delegates at ITB, 2017.

The European Geoparks

Celebrate our people.
Celebrate our heritage.
Celebrate our planet.



BOHEMIAN PARADISE GEOPARK, CZECH REPUBLIC

COPPER COAST GEOPARK, IRELAND

SUBBETICAS GEOPARK, ANDALUCIA, SPAIN

CABO DE GATA – NIJAR NATURAL PARK, ANDALUCIA, SPAIN

AZORES GEOPARK, PORTUGAL

UNESCO Global Geoparks (UGGs) are significant repositories for transferring knowledge of the Earth sciences to the general public and, what is equally important, highlighting the links between the natural heritage and the local communities. One of the key missions of Geoparks is to achieve these aims as effectively and visibly as possible. This is why the European Geoparks Week (often called the Geopark Festival), held in late May and early June, is a key part of the annual events calendar for all European Geoparks. During the EGN Week, 2017, 70 European Geoparks organized approximately 1,200 events that attracted nearly 125,000 people. Nowadays on-line promotion of the Geoparks on the web and social media plays an increasingly important role but still more than 208,000 programme flyers and over 5,500 printed articles were published in 23 European countries.

The programmes provided by our Geoparks were as diverse and as impressive as the geodiversity of Europe. This article provides an overview of the wide variety of events on offer.

Week 2017

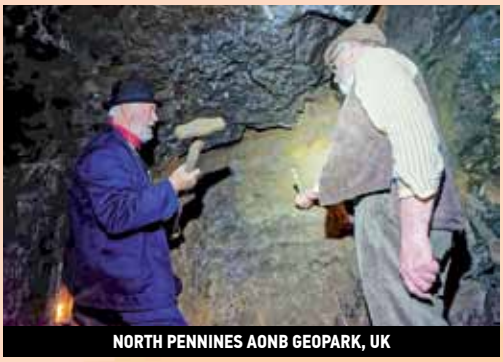

BAKONY-BALATON GEOPARK, HUNGARY


HAUTE-PROVENCE GEOPARK, FRANCE


BERGSTRASSE-ODENWALD GEOPARK, GERMANY


CENTRAL CATALUNYA GEOPARK, SPAIN


HATEG COUNTRY DINOSAURS GEOPARK, ROMANIA


NORTH PENNINES AONB GEOPARK, UK


NATUR- UND GEOPARK TERRA.VITA, GERMANY


LESVOS ISLAND GEOPARK, GREECE


VULKANEIFEL GEOPARK, GERMANY


IDRIJA GEOPARK, SLOVENIA


KARAWANKE/KARAVANKEN GEOPARK, SLOVENIA & AUSTRIA

The members of the EGN, as UNESCO Global Geoparks, joined and contributed to the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development, initiated by the United Nations. Contributions from our Network were reflected in numerous thematic events. Additionally, EGN Week also provided an excellent opportunity to present best practices of networking, e.g. within the framework of the World Environment Day (5th June) at UNESCO World Heritage Site Messel Pit, Germany. At this


GEOPARK OF POLLINO, ITALY


TUSCAN MINING PARK, ITALY


TERRAS DE CAVALEIROS GEOPARK, PORTUGAL


MADONIE GEOPARK, ITALY


KULA GEOPARK, TURKEY


LANZAROTE AND CHINIJO ISLANDS GEOPARK, SPAIN


VILLUERCAS-IBORES-JARA GEOPARK, SPAIN


LAS LORAS GEOPARK, SPAIN


SITIA GEOPARK, GREECE


SOBRARBE GEOPARK, ARAGON, SPAIN


GEOPARK HARZ. BRAUNSCHWEIGER LAND. OSTFALEN, GERMANY


KATLA GEOPARK, ICELAND


ODSHERRED GEOPARK, DENMARK


NATURTEJO GEOPARK, PORTUGAL


PARCO NATURALE ADAMELLO BRENTA, ITALY

event participants were shown how to prepare and cook biscuits related to the Earth history of the Portuguese Naturtejo da Meseta Meridional UGG. Since the European Geoparks Network was a Silver Partner in the 2017 International Year of Sustainable Tourism for Development campaign, even more guided geowalks, workshops and presentations for tourism professionals were offered than in previous years. In many cases, the outdoor programmes were more than the usual geotours: e.g. “Geobiking in the Green Way” (interpreting landscape and rocks) in Sierras Subbéticas UGG, Spain;“Cycling at the Centre of the Earth” in Troodos UGG, Greece;and coastal “Geokayaking” for schools in Geo Môn UGG, Wales, UK, were really popular events.


GEOPARK ERZ DER ALPEN, AUSTRIA


SESIA - VAL GRANDE GEOPARK, ITALY


MOLINA AND ALTO TAJO GEOPARK, SPAIN

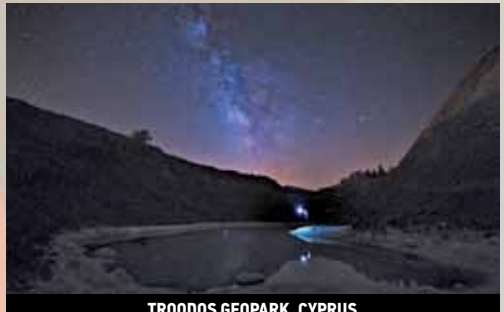

NORTH WEST HIGHLANDS GEOPARK, SCOTLAND, UK


NOVOHRAD – NOGRAD GEOPARK, HUNGARY – SLOVAKIA


PAPUK GEOPARK, CROATIA


PSILORITIS NATURAL PARK, GREECE


VIKOS – AOOS GEOPARK, GREECE


TROODOS GEOPARK, CYPRUS


NATUR-UND GEOPARK STEIRISCHE EISENWURZEN, AUSTRIA


SWABIAN ALBS GEOPARK, GERMANY

The lucky guests of Naturtejo Geopark, Portugal could taste the very special "GeoGin" (in a glass, decorated with a trilobite mascot), prepared by an expert on the local landscape with its folded quartzites and junipers. EGN Week is also a perfect time for publishing new geopark guides, e.g. Sierra Norte de Sevilla UGG, Spain. Our Italian colleagues in the Apuan Alps UGG organized a conference on disaster risk reduction. The staff of Lesvos Island UGG, Greece provided an educational programme "Earthquakes and Seismic Hazard" to raise awareness of mitigating the risk of injury during an earthquake — some weeks later the pupils in local schools were the lucky survivors of a strong earthquake...

Barnabás Korbély
(korbely@geopark.hu)


CHABLAIS GEOPARK, FRANCE

Welcome to the 8Th International Conference on UNESCO Global Geoparks

in Adamello Brenta, Trentino, Italy!

The Brenta Dolomites, a view that stirs the emotions. Photo by V. Masè.

Studying Adamello Glacier. Photo by G. Alberti.

The Adamello Brenta UNESCO Global Geopark has the honour to host the 8th International Conference on UNESCO Global Geoparks, from the 11 th to 14th September 2018. The Conference will be held in Madonna di Campiglio, a small village at the heart of the Geopark, located in the western part of Trentino in northern Italy.. The Adamello Brenta Geopark territory is an area of extraordinary geological and environmental interest. The Geopark aims to promote and protect its values through the development of environmentally focused geotourism and activities contributing to sustainable development. You are all invited to discover the spectacular uniqueness of its mountain landscapes, the remarkable geological and geomorphological diversity of the two mountain ranges that dominate the territory, the strong links berween the rich biodiversity and landscape, and above all to experience the local communities, their traditions and culture.

ADAMELLO BRENTA GEOPARK
Madonna di Campiglio - Italy
8th INTERNATIONAL CONFERENCE ON UNESCO GLOBAL GEOPARKS
8-14 SEPTEMBER 2018

The Conference, with the main theme "Geoparks and Sustainable Development", will be an opportunity for all participants to share their experiences, create networks and exchange the best practices applied in their territories. Come and submit your abstract by the 15th of April, 2018! In addition to the Conference sessions, special workshops will be organized in collaboration with the relevant GGN Working Groups. As usual, in the course of the Conference, one day is dedicated to the mid-conference field trip: participants will have the opportunity to choose from six available options, in order to get to know and experience the geological, natural and cultural peculiarities characteristic of the Adamello Brenta UNESCO Global Geopark. Moreover, a set of social and cultural events are planned during the Conference, with the opportunity to meet with the local people and to live the Italian lifestyle.

You can take advantage, during the Geo-fair, to showcase and promote your own territory, its services, activities and typical products to over eight hundred delegates from all over the world.

Families and friends can come with you and participate in the special programme provided for them in order to experience and discover the Adamello Brenta Nature Geopark in its entirety during the Conference

For those who would like to take the advantage of the journey to Italy and have the possibility to extend their stay, *Pre* and *Post Conference Tours* are organized together with the Italian Geoparks, where it will be possible to visit and admire the geological, natural and cultural heritage of Italy and its main cities.

Follow the latest news on the web site: **www.ggn2018.com** and hurry up to register for the 8th UNESCO GGN 2018 Conference! We look forward to welcoming you all at the Adamello Brenta UNESCO Global Geoparks.

Sharing the local tradition and culture with young people. Photo by G.Alberti.

Vajolet Masè, vajolet.mase@pnab.it

Nature and Geopark Styrian Eisenwurzen, Austria

Successful meeting of the Interreg Danube GeoTour Project

Project meeting in Austria from 20th – 23rd September 2017

Group photo of participants in the second project meeting at the Hotel Bergkristall Wildalpen, UGG Styrian Eisenwurzen.
Copyright Nature and Geopark Styrian Eisenwurzen.

The second meeting of the **Interreg Danube GeoTour Project** partners took place in Austria in September 2017. The UNESCO Global Geoparks Karawanken-Karavanke and Styrian Eisenwurzen had the chance to welcome the eleven project partners from eight countries. The project's subtitle shows the nature of the goal and the challenge confronting the partners: »*Valorisation of geo-heritage for sustainable and innovative tourism development of Danube Geoparks*« The project is co-funded by European Union funds (ERDF, IPA).

The main project result will be a joint Danube GeoTour designed to strengthen cooperation between the Geoparks' regions and acts as an innovative tourism product to accelerate visibility and tourist visits in the geoparks. Sharing experiences, testing pilot geotourism products and new interpretative approaches should increase local inhabitants' engagement, Geopark management capacities and reduce the quality gap between Danube and other EU Geoparks.

During the first day in the Geopark Karawanken-Karavanke in Carinthia, the partners had the opportunity to learn more about GeoInterpretation during a workshop held in the municipality Zell/Sele. A visit to the Geopark Information Centre in Bad Eisenkappel/Železna Kapla took place to explore various best practice examples for GeoInterpretation. In addition, the partners enjoyed three days within the heart of Austria at the UNESCO Global Geopark Styrian Eisenwurzen. In the Hotel Bergkristall Wildalpen the partners found everything they needed for their meeting and workshops. During "Capitalization" our partners learned more about other Interreg Danube projects especially DanubeparksCONNECTED and ECOKARST (www.interreg-danube.eu). The Welcome Dinner at the Spring Water Museum Wildalpen and the field trip (study tour) within the GeoVillage Gams were a welcome diversion to see the different GeoSites within the Eisenwurzen. In conclusion, all partners were satisfied with the success of the meeting. Finally, we extend many thanks to the organizers from Karawanken-Karavanke and Styrian Eisenwurzen including all helpers and partners involved in the meeting.

More information about the project and the organizers is available within the following links:
www.interreg-danube.eu/danube-geotour
www.eisenwurzen.com
www.geopark-karawanken.at

Oliver Gulas MSc,
(oliver.gulas@eisenwurzen.com)

Field trip to the GeoVillage Gams to visit the Noth Gorge in Gams, UGG Styrian Eisenwurzen.
Copyright Nature and Geopark Styrian Eisenwurzen.

Evening programme and welcome dinner at the Spring Water Museum Wildalpen, UGG Styrian Eisenwurzen.
Copyright Nature and Geopark Styrian Eisenwurzen.

Bergstrasse-Odenwald UNESCO Global Geopark, Germany

The "Global Nomadic Art-Project"

Inspired by geology, nature and landscapes

Namibian mountains on Dossenheim Rhyolite by Imke Rust (Namibia).

Photo exhibition of the art works at the International Forest Art Centre.

A cooperation project between the International Forest Art Association, the Centre for Art and Nature, Darmstadt, "Yatoo International", South Korea, and the UNESCO Global Geopark Bergstrasse-Odenwald (Germany)

When nature artists develop a relationship with their surroundings, the resulting artwork may be sophisticated and ephemeral, catching the passing moment or a concrete and enduring one. Each work of nature art is a unique blend of rocks, animals, plants, objects, landscapes and people, which are given a new meaning through the individual vision of the artist.

This is exactly what a group of 20 international nature artists achieved in two weeks within the framework of the "Global Nomadic Art Project". The artists were provided with background information about the geology, nature, history and landscape at a number of exceptional locations in the UNESCO-Global Geopark Bergstrasse-Odenwald Geopark. The resulting artwork, involving workshops lasting several hours included: "Adam"and "Eve"at Messel Pit; a Roman settlement and a supporting clay link between two giant boulders at the Felsenmeer; a creative form association using hay at the Oberfeld in Darmstadt; a meeting of clams in the Rhine wetlands; a stone meal and Namibian rock mountains in the Dossenheim abandoned quarry; and a sophisticated association between vines, flowers and fruits in Heppenheim.

Through their art, the artists recognized the changes which have a profound effect on the current environment and expressed their relationships with nature and roles as part of this continuing process.

Discussions during an Artist – Expert Meeting at the Schader Foundation (Darmstadt) examined the interrelationship between nature and art. In this context, the combination "Urban Nature Art" addresses the challenge of examining near natural sites in the densely populated Rhine-Main Region through artistic field studies. One of the most important conclusions was the recognition that Mankind is an integral part of nature. Thus the holistic approach of nature art taps into new emotional and philosophical levels promoting the dialogue between Man, Earth, nature and landscape – a vitally important aspect in view of the current global changes and a perfect bridge for communicating the holistic approach of the UNESCO Global Geopark.

The nature artists documented their works of art photographically and as audio and video recordings during the 16 workshops. An essential aspect, since the works of art are altered by natural processes but photos are permanent.

These were integrated into a large nature art photographic exhibition that was shown at the International Centre of Forest Art Darmstadt and is now embarking on a tour of two Geopark Information Centres. The big, final all-embracing show of the complete Global Nomadic Art Project from all continents will take place in 2019 in Gonjiu (South Korea).

The artist symposium is part of the globally active international YATOO-Project (Korea) which addresses large-scale global changes such as the destruction of nature or climate change and sees the works of art as an inspiration to think about our own relationship with nature. Info: www.gnap.info

Nature Artists from all-over the world in front of UNESCO WHS Messel Pit, nothern Entrance of UNESCO Global Geopark Bergstrasse-Odenwald.

Jutta Weber
(UNESCO Global Geopark Bergstrasse-Odenwald)
& **Ute Ritschel**
(International Forest Art Association)

Hateg UNESCO Global Geopark, Romania

Travelling Andi Andesite mascot connects 15 geoparks on four continents

Andi visits Bakony Balaton UNESCO Global Geopark, Hungary.

This summer, Andi Andezit, the mascot of the House of Volcanoes, one of the Hateg UNESCO Global Geopark's interpretation centres, travelled through 15 geoparks, on four continents. He visited extraordinary sites, he met interesting people, experienced the wonderful world of geoparks and shared the geopark message of peace and friendship. Following Andi, all his friends learned about geodiversity, different communities and the importance of the Global Geoparks Network.

Andi Andezit was born 70 million years ago when dinosaurs roamed the Hateg Island and marine volcanoes surrounding the island produced huge amounts of andesitic lava. He comes from this andesitic rock, now part of the Carpathian Mountains in the South-Western part of Transylvania. He is a piece of rock with an interesting personality, a fantastic geological memory and a burning desire to travel and discover other igneous rocks, volcanoes, geoparks and people living in other countries.

Andi is part of a project started by Hateg UNESCO Global Geopark in 2014 – the House of Volcanoes – which aims to put into practice innovative techniques of geo-interpretation, community involvement and economic development. The House of Volcanoes was built entirely by the volunteers of the Geopark in 2014 to look like a volcano.

Andi is a character and a mascot contributing to interpretation and education for children and students. He is now one of the Geopark's symbols and a very charismatic ambassador. To be able to travel to so many places, Andi needed the help of the Geopark`s Ambassadors and Volunteers. They have sent Andi to other geoparks, and in return, have received pictures, stories and greetings. Andi has a Facebook page and anyone can follow him on his journey. Everywhere he went, Andi was received with joy and curiosity. Many people from geoparks guided Andi and showed him their areas, took him to local celebrations, taught him traditional crafts and made him taste local food.

On 24th of August, Hateg UNESCO Global Geopark celebrated Volcano Day and Andi hosted visitors from Romania and abroad and virtual visitors from the geoparks he visited during this summer. It was an adventure and an opportunity to present the Earth's geology and Andi's travels. A place in Hateg town was transformed for a day into a miniature Earth and participants could travel together with Andi and visit and experience UNESCO Global Geoparks.

Andi's travels are a creative way to establish connections between geoparks, to share the experience of our ambassadors and volunteers and inspire young people from other territories. It was a good way to answer the questions: What is the GGN and what is its importance? He will definitely continue his travels because now his goal is to go to all the UNESCO Global Geoparks, then to aspiring Global Geoparks. He has a lot of travel and experience ahead of him.

Cristian Ciobanu (ciobanu.cristian@yahoo.com)
Alexandru Andrasanu,
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Andi meets a mounted policeman during his visit to Canada.

The children from Ciletuh-Palabuhanratu Aspiring Global Geopark enjoy Andi's visit to their country.

Rokua (Finland) and Sesia Val Grande (Italy) UNESCO Global Geoparks

GEOclimHOME

Feedback and perspectives of students' exchanges on climate change

The GEOclimHOME team at the Corno del Camoscio (3024 m above sea level, Mount Rose, Italy) discovering the effects of climate change on high mountain environments. The team visited the Mosso Institute, an international scientific research centre included within the LTER network.

The partnership between Rokua (Finland) and Sesia Val Grande (Italy) UNESCO Global Geoparks delivers positive results, by developing effective educational experiences on climate change for international students. The three years (2015-2018) Erasmus + project GEOclimHOME (Geoheritage and climate change opening the secrets of home) has provided a great opportunity to share and to consolidate good practices for the Geoparks Network.

The partners implemented the organization of alternating Italy/Finland exchanges for groups of high school students (aged 16-18). During a period of five days of scientific activities the students actively work together to achieve a better perception of the links between cultural heritage, geological heritage, ecosystems and climate change. Moreover, each year the partners proposed diverse activities within different areas of the Geoparks, thus involving several stakeholders. These resulted in activities fostering sustainable development of the Geoparks' areas local families host students, local teachers or hotels host teachers and researchers, transport employs local bus companies, visits involve local museums and specialized staff, such as restaurants and shops. As a result, these days are a great opportunity to strengthen cooperation, both at a national and international level, during the duration of the project: between students, families, high school teachers, university researchers, cultural and environmental associations, and local administrators.

Students sample peatlands in the Rokua UNESCO Global Geopark.

Throughout the project, the partners identified some environmental conditions and indicators to be studied and compared in both territories, for building coherent educational programmes on climate change. Examples include: pollinators, butterflies, vegetation, lacustrine water, and ice. The intention is to offer insights on both natural and cultural sites and events, which can be explored as examples of the active or passive role of humans with respect to a changing environment.

The involvement of the Chablais UNESCO Global Geopark (France), as a new partner joining the project in 2018, is an encouraging prospect. Teachers, researchers and the educational staff of the three Geoparks are already involved in designing structured educational programmes. These will focus on the following issues in the Sustainable Development Goals spearheaded by the United Nations: quality education, clean water and climate.

The last day of the week exchange, students analyse the data collected during the research activities and prepare a final presentation.

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The ESTEAM Project eBook

"Research of National Curricula of Natural Sciences in Portugal, Norway and Slovenia"

Partners preparing a questionnaires during the 1st partner meeting in Črni Vrh nad Idrijo elementary school (Idrija UGG, Slovenia).

Group photo of partners in the ESTEAM project at Monsanto trail, which will be a pilot trail in Naturtejo UGG, Portugal.

The ESTEAM project, co-financed by the ERASMUS+ Programme of the EU, started in September 2016 and will run for 36 months. The partnership consists of three UNESCO Global Geoparks – Idrija, as a lead partner, Magma, and Naturtejo, 2 schools within the geoparks areas, the Department of Geology at the Faculty of Natural Sciences and Engineering (UL), and an ICT company Locatify. The target groups of the project are teachers and future Natural Science teachers, pupils aged 12-15, geoparks' staff, and employees in educational institutions.

The eBook "Research of National Curricula of Natural Sciences in Portugal, Norway and Slovenia: analysis and guidelines" is the first output of the project. It consists of 6 chapters, the first two being the introduction and the descriptions of all partners, and the following focusing on the current methodology in teaching Natural Sciences, researches of national curricula and needs, new trends and good practices in natural sciences teaching in elementary schools and, finally, conclusions.

The research of the national curricula of natural science teaching and the analysis showed differences in three countries. The most evident was already the list of subjects taught within the framework of Natural Sciences: Natural Sciences, Biology, Geology, Physics, Chemistry, and Geography. The list is different in each country. Additionally, in order to understand the needs for improvement in the natural sciences learning/teaching process we prepared online questionnaires, which were addressed to pupils, teachers and future Natural Science teachers. We also had personal interviews with teachers in domestic geoparks. The analysis of responses from the 792 participants showed interesting results. Students enjoy Earth Sciences; however, they can have some problems understanding the contents. Considering teaching methods, pupils and teachers are on opposite sides; the former prefer using standard methods, while the latter lean more towards newer, more modern ones. Teachers rarely if ever use tablets or mobile phones for lessons. Appealing is also the frequency of outdoor activities. The majority has less than 5 days of outdoor activities per annum, but all would like this number to be much higher. Based on the results, the majority is not familiar with the UNESCO Global Geoparks. Those who are, are seeking help in terms of preparation of materials, field trips, experts' help and organization of activities.

Trying out an educational App in Ystebrød trail in Magma UGG, Norway.

Based on a wealth of information from the first stage we are now preparing contents and different games for three different chosen topics: Man's Impact on Earth, Ecology, and Geology. In the second stage a mobile App will be created. At the end of the third stage, a Step-by-Step guide for teachers about using ESTEAM methodology for teaching will be developed.

The eBook is available at: http://esteamproject.wixsite.com/mysite/intellectual-outputs.

Mojca Gorjup Kavčič, Nina Erjavec, Maria Manuela Catana, Mariana Vilas Boas, Carlos Neto de Carvalho, Liliana Homovec, Maja Sever, Andrej Šmuc, Tomislav Popit, André Azeiteiro, Elsa Cantinhas, Åse Hestnes, Pål Thjømøe, Sara Gentilini

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PARCO GEOMINERARIO STORICO AMBIENTALE DELLA SARDEGNA

Geological, Mining, Historical and Environmental Park of Sardinia, Italy

UNESCO-EDU SARDINIA

A New partnership concerning Heritage and Landscape – Networking of Sardinian UNESCO Sites

The Sardinia UNESCO Global Geopark delivering the UNESCO Edu project to school pupils.

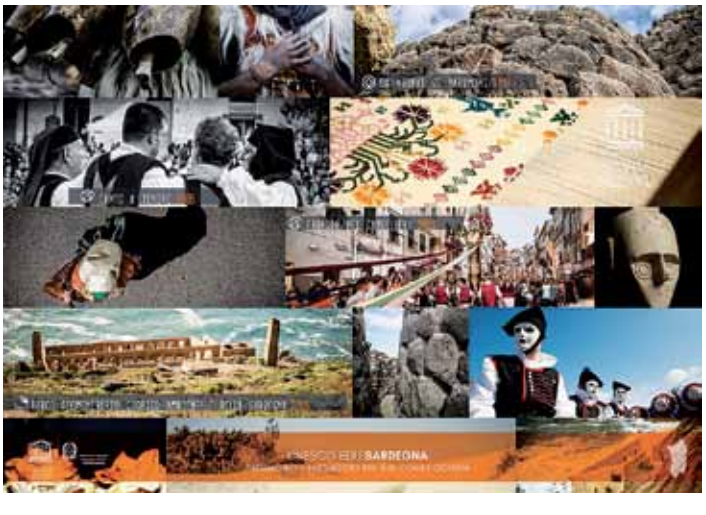
The UNESCO Edu project in Sardinia is developed as an educational laboratory for higher education and for the integrated promotion of UNESCO's heritage in Sardinia. The aim is to raise young people's awareness of UNESCO's themes and values, educate them for an active and aware citizenship, and make them mindful of their territory. These are some of the goals of the UNESCO Edu project, the National Education Programme for schools and universities promoted by the Young Committee of the Italian National Commission for UNESCO in conjunction with the Ministry of Education, University and Research.

In the framework of the Memorandum of Understanding, agreed and signed by UNESCO Youth Italy and the Ministry on 19 January 2016 this project was launched in every region of Italy with the intention of including the international programmes developed by UNESCO in the fields of Education, Communication and Information, Natural Sciences, Humanities, Social Sciences and Culture in the school and university curricula. More than 2000 students and more than 60 educational institutions have been involved in UNESCO Edu. The project includes 44 cities and 13 UNESCO designated sites, providing over 2400 hours of laboratory teaching and involving 77 public bodies and 55 private companies.

A special protocol of understanding between the Geological, Mining, Historical and Environmental Park of Sardinia and the UNESCO Youth Committee guarantees co-operation aimed at realizing activities and awareness of young people concerning the enhancement of cultural heritage by UNESCO sites. In particular, the collaboration has enabled the use and promotion of all Sardinian UNESCO Sites for specific insights into the island's heritage and into the social implications of UNESCO's designations.

The project has developed operational synergy and collaboration between the Sardinian UNESCO sites. In Sardinia there are currently four UNESCO affiliated sites: the World Heritage Site Su Nuraxi of Barumini (1997), two intangible assets listed on the Intangible Assets List, the Tenor Singing of Pastoral Culture in Sardinia (2005) and the feast day of the Candleholder of Sassari (2013) and the Sardinian UNESCO Global Geopark.

The project has allowed the inclusion of the participating Sardinian high schools in the network of schools associated with UNESCO. This network combines many schools around the world (the ASPnet) and pursues the goal of building peace advocacy in the minds of children and young people. Over 10,000 schools in 180 countries around the world work to encourage international cooperation, peace, intercultural dialogue, sustainable development and quality education. ASPnet is recognized as an effective tool for achieving Target 4.7 on Global Citizenship Education (GCED) and Education for Sustainable Development (ESD) foreseen in Goal 4 of Agenda 2030 for Sustainable Development.



A collage of UNESCO designated sites in Sardinia Geopark.

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Geoparkea
Costa Vasca · Euskal Kostaldea

Basque Coast UNESCO Global Geopark, Spain

Successful day of "Geo-talks: Science, Culture and Fun"

General view of the dome during one of the talks about the archaeological heritage of the Geopark.

The Basque Coast UNESCO Geopark brought a new initiative to Donostia-San Sebastián which included innovative 'TED'-style scientific talks in addition to music, theatre, live drawing and other forms of artistic expression connected to Basque culture.

Scientists and artists came together on May 19th in Donostia-San Sebastián under a new and pioneering initiative titled 'Geo-Talks: Science, Culture and Fun', organized by the Basque Coast UNESCO Global Geopark. It is the first time the Basque Coast Geopark has reached outside its territory — comprising Deba, Mutriku and Zumaia — with an impressive and original initiative to disseminate science to the general public. The main aim was to bring people closer to the geological, natural and cultural splendour of the Geopark, with an enjoyable and attractive approach that involved the scientific message in an entertaining package. The event was a veritable success!

The 100 or so people who came to the geodesic dome, installed for the occasion, had the opportunity to listen to six short and educational talks of between 8-10 minutes about geology, ecology and prehistory, delivered by six renowned specialists who are all members of the Scientific Committee of the Basque Coast Geopark. The speakers stood on the stage one by one to present their knowledge in a rigorous yet entertaining format. Drawing on their field or subject of expertise, each speaker addressed different aspects of the values of the Basque Coast Geopark.

The dome was full of people who enjoyed learning and laughing together with scientists, musicians, artist and comedians.

The scientific talks alternated with performances by local artists.

The scientific/cultural event was also attended by geologist Stanley Finney, professor at California State University, Secretary General of the IUGS (International Union of Geological Sciences) and President of the Scientific Committee of the Basque Coast Geopark.

There was also music, theatre, live drawing and other forms of Basque artistic expression by artists from the Geopark, including *txalaparta* (a traditional percussion instrument from the Basque Country) and *bertsos* or *bertsolarismo* (the art of singing in improvised verse, one of the most prominent features of Basque culture and oral literature). In addition, the event was delivered in three languages: Basque, Spanish and English.

Complementary to the success of the event, one of the most positive aspects of the initiative has been to bring together some of the most renowned international researchers from the Geopark with a group of local artists, with the aim of joining science with culture and combining local and international interests in the territory.

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Ore of the Alps UNESCO Global Geopark, Austria

"Music was my first love..."

St. Rupert youth Brass Band. Photo St. Rupert School.

The Ore of the Alps UNESCO Global Geopark is famous for copper mining. Traces of mining can be found from the Bronze-Age until the end of the 1970s, when all mining activities were terminated. During the Bronze Age the area of the Geopark was one of Europe's most important copper mining centres. Copper was used at that time for making tools, weapons, jewellery and cult objects. The latter were often made of bronze, an alloy of copper and tin. The copper of the bronze components of the Nebra-Sky disc originate from the Geopark. All these objects from the Mitterberg/Buchberg region were made with copper famous for its high quality,

Nowadays weapons are not made from copper, instead it is now a component of more peaceful musical instruments. Copper is the primary raw material of the Lechner Music Company. The workshop in Bischofshofen produces brass wind instruments. Inspired by the requirements of domestic and international musicians, the instruments fulfill the highest demands of response, sound and intonation and set standards worldwide. Instruments made by the company can be found all over the world, e.g. Salzburg Mozarteum Orchestra, Vienna Philharmonic Orchestra, Berlin Philharmonic Orchestra, Orchestre de Paris, London Royal Opera House, André Rieu Orchestra Holland, Florida Philharmonic Orchestra, Shanghai Philharmonic Orchestra and others.

Making a trumpet in the workshop of the Lechner MusicCompany. Photo M. Lechner.

The People-Power-Music exhibition, 2016 in the Geopark's visitor centre. Photo H. Ibetsberger.

The raw materials such as brass, goldbrass (a brass alloy with a higher copper component) or nickel silver for the production in the Gaisbergsiedlung in Bischofshofen are derived entirely from Europe. The copper content is among other things essential for the sound, response and the durability of the brass instrument. Approximately 30 working hours are used in the production of a trumpet. Instruments can be tailored to each musician´s personal requirements. Lechner Music is one of the leading companies and a "proud partner" and supporter of the Ore of the Alps UNESCO Global Geopark.

The special exhibition in the Geopark Visitor Centre in 2016, entitled "Man-Power-Music", provided an overview of the different folk music brass bands in the Geopark. The title "Man and Power" reflects how, following World War II, many people, mainly from Southern Tyrol, left their homeland and found a new home and employment in the large copper mining industry of today's Geopark. When the miners finished their work in the evening or during the weekend, many of them played in local folk music groups. In summary, it can be said, that the miners produced the copper for their instruments by their own hard work.

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GeoParc de la Catalunya Central

Central Catalonia UNESCO Global Geopark, Spain

Collaborate in a Cantata with schools of music in the region in which 900 children participate

Queralt Somiatruites accompanied by the mascot of the Central Catalonian Geopark, illustrator, director and scriptwriter of the cantata.

This was held on Sunday 17 April at the Kursaal Theatre in the city of Manresa, and 21 music schools from the Geopark region took part in the event.

The Geopark of Central Catalonia collaborated with the Catalan Association of Music Schools in a cantata that included almost 900 children from 21 different schools (from Bages, Berguedà, Osona, Barcelona, Alt Urgell and Solsonès). The children's performance was held on Sunday 17 April at the Kursaal Theatre in the city of Manresa, capital of the Geopark of Central Catalonia, with the title "Queralt Somiatruites" (Queralt the Dreamer, in Catalan). The cantata this year wanted to show the uniqueness of our territory through a pedagogical activity to promote the on-going task of preserving the territory and increasing awareness of the geological and geographical wealth from the Central Catalonia Geopark. The children participating were between 3 and 8 years old and they interpreted music by Xavi Ventosa with texts by Manel Justice. The cantata sings about the story of Queralt and features the illustrations by Doris Jiménez.

The names of the characters, the music, the scenarios... everything has been chosen to underline the value of the territory of the Geopark. In addition, one of the characters is Mole the Geologist, the mascot of the Geopark. The people who attended the performance of the cantata were given promotional material from the Geopark with the objective of promoting the geological importance of the territory and enhancing geotourism.

The story revolves around the Queralt Somiatruites, a very imaginative girl, whose feet rise from the ground when she starts to imagine. Her grandmother Barbara proposes that they get stones with memories so that they can be put into her pockets to keep her feet on the ground. In this way, an adventurous journey begins where each grandfather/grandmother gives a child a stone with a special memory. The chosen stones and their meaning are meant to symbolize the values that have made our Geopark: a fossil representing science, a plaster representing dreams and imagination, a round stone that signifies patience and effort, and a stone in the shape of a heart that represents love and the passion for the life.

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Participants in the kursaal Theatre in Manresa sing the adventures of Queralt Somiatruïtes on their journey through the Geopark.

Nine hundred children from 21 different schools participate in the "Queralt Somiatruïtes" (in Catalan, Queralt Dreamer) organized by the Catalan Association of Music Schools in collaboration with the Geopark of Central Catalonia.

Swabian Alb UNESCO Global Geopark, Germany

The first Geopark-School

Cave guidance by pupils of the Geopark-School during the revalidation mission of Swabian Alb Geopark, 2017.

Primary school in Kolbingen is the first Geopark-School in Swabian Alb Geopark.

In the new educational plans of the state of Baden-Württemberg, the possibility has been created for schools to be prominent in the field of Education for Sustainable Development and work together with other institutions. The educational plans apply to all schools and grades.

The school project in the Swabian Alb Geopark aims to include 2-3 schools from each of the member counties of the Swabian Alb, to engage with Geopark issues and thus, in future, operate as Geopark Schools. The idea for this project was initiated in collaboration with our partner Rokua UNESCO Global Geopark in Finland, where a similar school project was successfully implemented. Our colleagues from Rokua gave us helpful advice in realizing the project.

The German UNESCO Commission supports the Geopark project. Five UNESCO project schools in the Swabian Alb showed interest in participating. These include, three grammar schools, a secondary school and a school for pupils with special educational needs.

For the project to run successfully, only motivated schools will be designated as Geopark schools. For this purpose, an application process will be developed in which schools must prove how they intend to implement the concept in schools. In addition, regular evaluations are to be carried out by the Geopark to ensure the quality of education.

The schools should cooperate closely with local Geopark partners. The partnership between the Geopark and the Building Material Association Baden-Württemberg has made it possible to use quarries as open air classrooms. The cross-generational collaboration between schools and experienced landscape guides will give students the opportunity to experience nature with all their senses.

The task of the Geopark is to develop educational proposals for different schools and grades in close cooperation with the schools. This enables the teachers to implement well-prepared teaching modules in their lessons without great preparation and prior knowledge.

In June 2017, a primary school in Kolbingen in the county of Tuttlingen was inaugurated as the first Geopark School. In its mission statement, the school commits itself to educating pupils on sustainability, nature and environmental protection. Geopark schools will in future be identified by a uniform plaque and logo.

The school's curriculum includes activities such as an annual landscape management day in association with the municipality and the local hiking association. Other activities include bread baking, forest walks with the forester, visits to neighbouring Geopark info centres or the preparation and the identification of fossils. Kolbingen municipality is well-known for an amazing visitors' stone cave, a Geopark info centre since 2016. A good idea from the school is to train children as cave guides. In future, the local caving club will have children who can lead other children or school groups competently through the beautiful cave.

Celebratory inauguration of the Geopark-School in Kolbingen.

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GEOPARK TERRAS DE CAVALEIROS

Terras de Cavaleiros UNESCO Global Geopark, Portugal

"Treasures and knowledge of the Terras de Cavaleiros UNESCO Global Geopark"

Meeting with the inhabitants of the Geopark's communities.

In 2017, the Terras de Cavaleiros UNESCO Global Geopark developed a project entitled "Treasures and knowledge of the Terras de Cavaleiros UNESCO Global Geopark". The aim of this project is to safeguard the Geopark's cultural heritage by creating a database that allows its inhabitants to record, share and strengthen their identity.

A shared intangible cultural heritage is an important component in the life of the people who inhabit a territory and is preserved for future generations.

Collecting, valuing and disseminating the intangible cultural heritage is a means of ensuring that everything that is part of people's history and culture, that gives them a sense of belonging to a particular community and / or place where they were born or live, will not be lost in time.

Thus, during the first phase of planning, the Geopark presented its "Intangible Cultural Heritage, Terras de Cavaleiros UNESCO Global Geopark" project to the thirty presidents of the civil communities as they are the most important link to the population.

During the second phase, informal meetings with the presidents and older members of the civil communities were arranged because it was considered that social interaction plays a fundamental role in stimulating relationships. This phase was extremely important because, through informal conversations, spokespersons for delivering the intangible heritage for each community were identified. The histories and stories were collected and recorded on audio files.

The third phase involved the compilation, transcription and organization of all the data by topics. These include tales, legends, life stories, riddles, proverbs, prayers, songs and traditional games.

The objective of the final phase of this project, which is still ongoing, is to disclose and share all this precious information with the inhabitants of each community.

Terras de Cavaleiros UNESCO Global Geopark is a territory with an vibrant cultural heritage revealed through the exploration and discovery of its people and their unique traditions. A heritage that deserves to be preserved and continued and for which we are all responsible.

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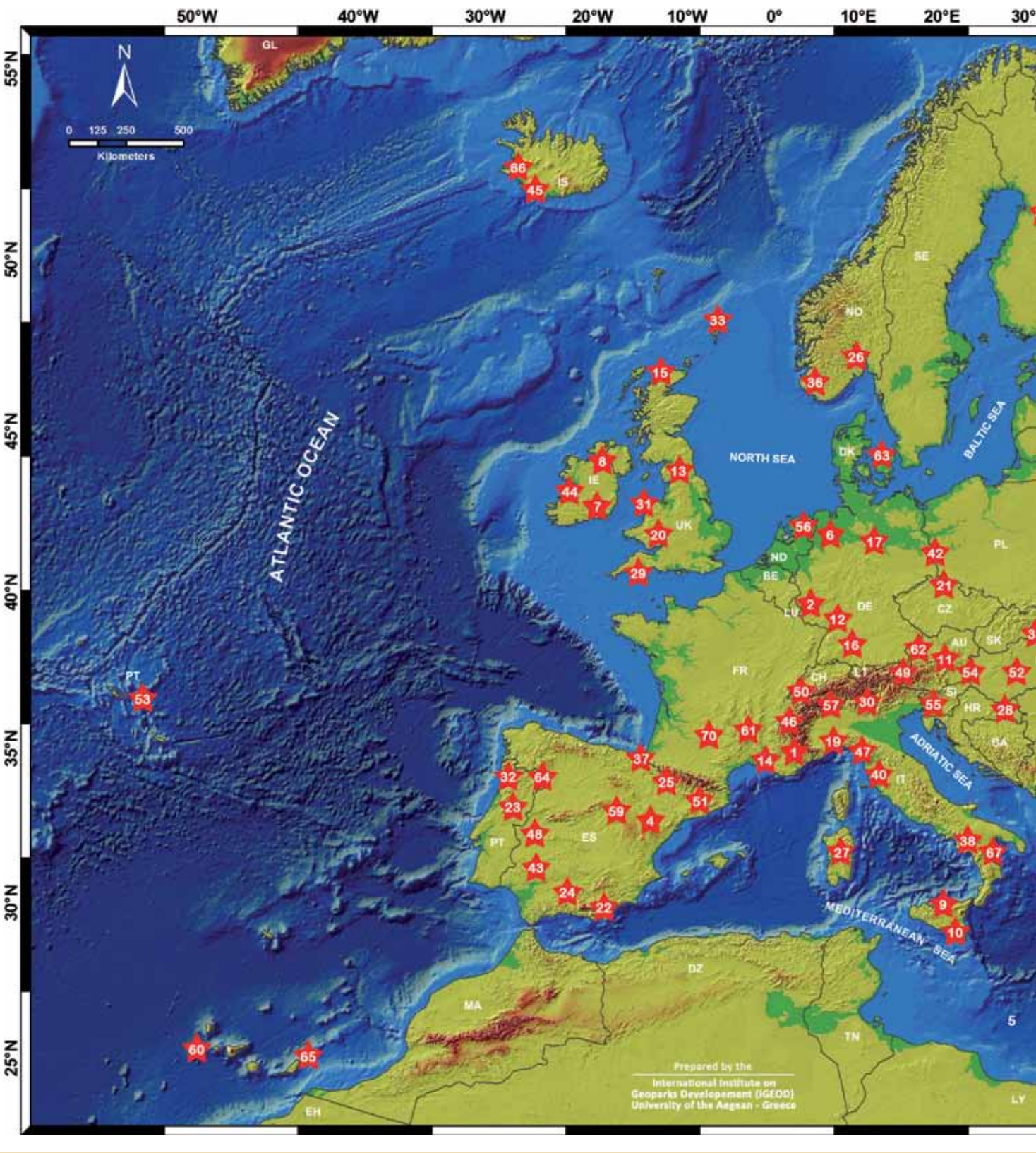
Recording the people's memories.

Power point presentation of the project.

The European Geoparks Ne



The Network consists of 70 Geoparks in 23 European c

www.europeangeoparks.org

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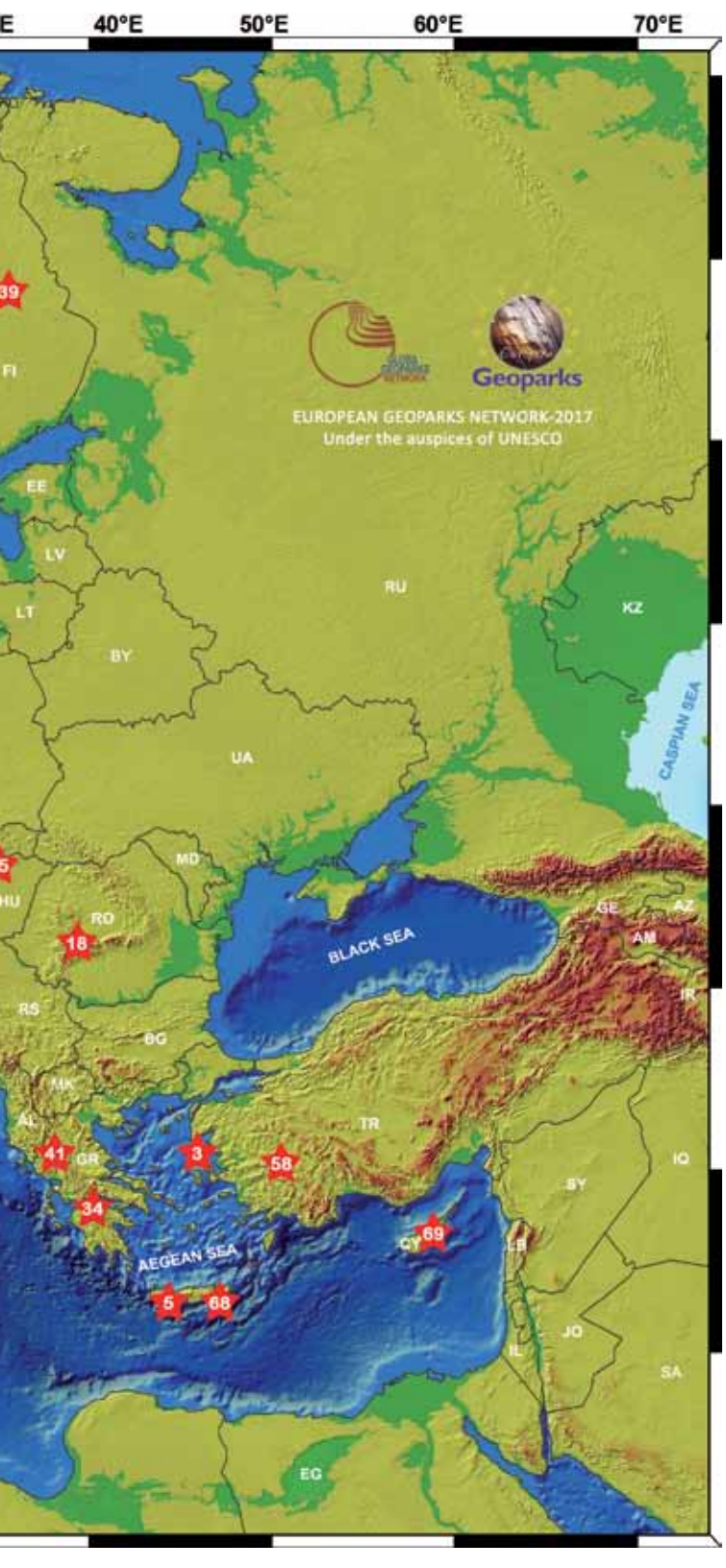

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1. Haute-Provence Geopark	FRANCE
2. Vulkaneifel Geopark	GERMANY
3. Lesvos Island Geopark	GREECE
4. Psiloritis Natural Park	GREECE
5. Natur- und Geopark TERRA.vita	GERMANY
6. Copper Coast Geopark	IRELAND
7. Marble Arch Caves Geopark	IRELAND
8. Madonie Geopark	ITALY
9. Rocca di Cerere Geopark	ITALY
10. Natur-und Geopark Steirische Eisenwurzen	AUSTRIA
11. Bergstrasse-Odenwald Geopark	GERMANY
12. North Pennines AONB Geopark	UK
13. Parc Naturel Régional du Luberon	FRANCE
14. North West Highlands Geopark	Scotland, UK
15. Swabian Albs Geopark	GERMANY
16. Geopark Harz. Braunschweiger Land. Ostfalen	GERMANY
17. Hateg Country Dinosaurs Geopark	ROMANIA
18. Parco Del Beigua	ITALY
19. Fforest Fawr Geopark	UK
20. Bohemian Paradise Geopark	CZECH REPUBLIC
21. Cabo de Gata – Nijar Natural Park	ANDALUCIA, SPAIN
22. Naturtejo Geopark	PORTUGAL
23. Subbeticas Geopark	ANDALUCIA, SPAIN
24. Sobrarbe Geopark	ARAGON, SPAIN
25. Gea Norvegica Geopark	NORWAY
26. Geological Mining Park of Sardinia	ITALY
27. Papuk Geopark	CROATIA
28. English Riviera Geopark	UK
29. Parco Naturale Adamello Brenta	ITALY
30. GeoMôn GeoPark	WALES – UK
31. Arouca Geopark	PORTUGAL
32. Geopark Shetland	SCOTLAND – UK
33. Chelmos – Vouraikos Geopark	GREECE
34. Novohrad – Nograd Geopark	HUNGARY – SLOVAKIA
35. Magma Geopark	NORWAY
36. Basque Coast Geopark	SPAIN
37. Parco Nazionale del Cilento e Vallo di Diano	ITALY
38. Rokua Geopark	FINLAND
39. Tuscan Mining Park	ITALY
40. Vikos – Aoos Geopark	GREECE
41. Muskau Arch Geopark	GERMANY/POLAND
42. Sierra Norte de Sevilla Natural Park	SPAIN
43. Burren and Cliffs of Moher Geopark	IRELAND
44. Katla Geopark	ICELAND
45. Massif des Bauges Geopark	FRANCE
46. Apuan Alps Geopark	ITALY
47. Villuercas-Ibores-Jara Geopark	SPAIN
48. Carnic Alps Geopark	AUSTRIA
49. Chablais Geopark	FRANCE
50. Central Catalunya Geopark	SPAIN
51. Bakony-Balaton Geopark	HUNGARY
52. Azores Geopark	PORTUGAL
53. Karawanke/Karavanken Geopark	SLOVENIA & AUSTRIA
54. Idrija Geopark	SLOVENIA
55. Hondsrug Geopark	NETHERLANDS
56. Sesia - Val Grande Geopark	ITALY
57. Kula Geopark	TURKEY
58. Molina and Alto Tajo Geopark	SPAIN
59. El Hierro Geopark	SPAIN
60. Monts d'Ardèche Geopark	FRANCE
61. Geopark Erz der Alpen	AUSTRIA
62. Odsherred Geopark	DENMARK
63. Terras de Cavaleiros Geopark	PORTUGAL
64. Lanzarote and Chinijo Islands Geopark	SPAIN
65. Reykjanes Geopark	ICELAND
66. Geopark of Pollino	ITALY
67. Sitia Geopark	GREECE
68. Troodos Geopark	CYPRUS
69. Causses du Quercy Geopark	FRANCE
70. Las Loras Geopark	SPAIN

Lesvos Island UNESCO Global Geopark, Greece

AEGEAN - The Birth of an Archipelago

Promotion of Earth heritage through a travelling exhibition on a world tour!

The Prime Minister of Greece Alexis Tsipras visiting the exhibition in Chicago.

Travelling exhibitions dedicated to honouring, preserving, and interpreting the history and heritage of our planet Earth can become powerful tools for promotion to the broader public and for alerting our societies of the need for the protection and rational management of our Geological Heritage. Exchanges between Geoparks and their Museums can become new opportunites for collaboration and exchange among local communities and can boost geo-tourism.

The travelling exhibition "AEGEAN The Birth of an Archipelago" of the Natural History Museum of the Lesvos Petrified Forest presented in Chicago, USA, was visited by thousands of visitors, among them the Greek Prime Minister A. Tsipras. The exhibition, following a successful two-year stay in the National Hellenic Museum in Chicago, is ready to continue its journey in the world promoting the geological heritage of the Aegean Archipelago worldwide. Since its journey began in 2014 the exhibition has been presented in Chicago, Moscow, Rome, Athens and Thessaloniki.

The exhibition invites visitors to dive beneath the surface of the Aegean Sea and rediscover its literally groundbreaking history. The story of its creation is full of geological transformations, volcanic eruptions, the formation of islands, extinct civilizations and, of course, mythical figures. The exhibits, including photographic and audiovisual displays, present the evolution of the Aegean islands and the history of the processes that created the islands, their spectacular landscapes and geosites.

The exhibition is divided into three main parts. The first "GAIA MEMORIES: from Tethys to Aegean" reveals the wealth of the geological treasures. Monuments, rock formations, fossils and specimens unravel the history of this fascinating sea. The captivating story continues with an audiovisual production featuring tectonic changes, the eternal fight between fire and water and the geological processes that shaped the beauty of the Aegean Archipelago. The second "The islands of Hephaestus and Poseidon" is a journey through the depths of time and shows how tectonic plates, earthquakes and lava gave the Aegean Sea its present form. Models of active volcanoes, impressive film footage and real volcanic rocks provide a backstage view of a volcanic eruption. The third "GAIA: from myth to science", where visitors come face to face with the impressive evolution of life in the Aegean basin. This is demonstrated by a plethora of plant and animal fossils, as well as early hominids.

Highlights of the exhibition are unique fossils and an impressive petrified tree trunk from the 20 million years old petrified forest of Lesvos, interactive games and multimedia especially designed to educate and amuse visitors of all ages, quizzes with real exhibits that show visitors how to recognize rock formations, fossilized plants and organisms and a triple-screen film footage of the Aegean Sea and its Islands as they were captured in fascinating aerial photos.

The exhibition is complemented by educational and informative activities. More information about the exhibition is available at www.aegeon.org.gr.

The exhibition "AEGEAN - The Birth of an Archipelago" in Chicago USA.

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Parco del Beigua
European & Global Geopark

Beigua UNESCO Global Geopark, Italy

Connecting geological heritage and cultural heritage

A view of the Tiglieto's Plain.

The Tiglieto's Plain is a flat area of about 30 hectares which represents one of the major superb sites in the Beigua Geopark's territory, not only because of its geomorphological features, but also because of its outstanding culture, history and monuments.

The Tiglieto's Plain houses one of the most valuable historical and cultural sites in the Geopark: the Cistercian Abbey of Santa Maria alla Croce. The monastery was founded on October 18th 1120 by a community of Cistercian monks from the Burgundy Abbey of La Ferté. The monastery is the first Cistercian foundation created outside the borders of France and Burgundy (the region in which the Order of Cistercians was founded). The monks initiated a form of land development based on a network of farmhouses which served as centres for breeding, agriculture, and forestery that were connected to the monastery through a widespread network of roads.

Based on a a comparison of the historical, geographical, geological and environmental data, it can be assumed that in the Middle Ages the Tiglieto's Plain was characterized by an extensive marshy swamp. Drilling surveys at the site were carried out before the restoration of the monastic complex (supported by the Beigua Geopark's Authority, the Liguria Region Administration and local Authorities). These investigations were supplemented by additional geological, geophysical and geomorphological studies by researchers from the University of Genoa. The stratigraphy of the area is characterized by alluvial deposits (silty-clay and gravelly-sand), with intercalated ophiolitic blocks. The predicted weathered and fractured bedrock was intercepted at a depth of about at 6 - 9 metres. The approximately upper two metres of section consist of silts and clays deposited in a low energy depositional environment. These are interpreted as the product of fluvial-lacustrine deposition resulting from the damming or partial damming of the Orba River by a landslide. This occurred on the wide slope that defines the Bric della Bandita to the east, in the western sector of the plain. The monks reclaimed the area by optimizing the water regime through the creation of a network of channels. The clays which constitute the surface layer of the plain were exploited for the production of the bricks used in building the religious complex and the surrounding houses.

The Cistercian Abbey of Santa Maria alla Croce.

The Capitular Hall.

The recent major restoration work recovered the church (basilica plan with three naves), the monks' cells, the Capitular Hall (a square room with nine equal spans and refined decoration), the Armarium (the ancient deposit for the codes and documents of the abbey) and the cloister (a quadrangular space of about 30 meters per side). It is now possible to visit the complex on a regular basis and some interpretative panels, displayed at the site, explain the connection between the geological heritage and the cultural heritage of the area.

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Fforest Fawr UNESCO Global Geopark, UK

Geological, industrial and cultural heritage as resources for geotourism

Fforest Fawr UNESCO Global Geopark is an area of outstanding natural beauty in which former industrial activity has been replaced by geo-conservation and the promotion of geo-tourism as drivers for sustainable economic development.The Geopark's approximately 480 million years of geological history and the area's industrial, cultural and social heritage provide a rich resource for geotourism and educational activities. The Industrial Revolution started in Britain sometime between 1780 and 1800. Although iron smelting in South Wales started as early as the beginning of the 17th century, metal production increased from 1750 onwards with the development of the lower Swansea Valley as a global centre for copper production and the establishment of iron works along what is now the southern boundary of the Geopark. With the advent of the Industrial Revolution the exploitation of the geological resources of Fforest Fawr fuelled the development of a burgeoning metal industry for over 200 years. Mining, quarrying, brick making and the expansion of agriculture to feed a growing population contributed to wealth creation as South Wales became a major player in the new industrial age which changed the world. Coal, the mainstay of metal production, was mined in the southern area of the Geopark. Limestone quarrying and lime burning provided lime for use in agriculture and as a flux in the metal industry. Silica used in the manufacture of refractory bricks, which were exported worldwide, was derived from sand deposits and crushed quartz rich sandstone. Rottenstone, a fine siliceous powder, derived from weathering of the topmost unit of limestone of Carboniferous age was used for polishing copper and tinplate. Transporting the raw materials to the furnaces in the industrial centres resulted in the development one of the earliest examples of an integrated transport system involving networks of tramways, canals and later railways.

During several years of economic decline the quarries, mines, brickworks and elements of the transport system were abandoned. However, all of these monuments of the industrial age are now an important contributor to geotourism in the Geopark. Disused tramways now provide access to weathered, overgrown and sometimes restored relics of Fforest Fawr's industrial heritage serving as destinations for walkers, educational groups and providing recreational sites. The Limestone quarry at Craig y Dinas provides an ideal site for climbers of all abilities and is used almost on a daily basis. Silica mines in the steeply wooded Sychryd Valley are now enjoyed by cavers. A tramway, with its still intact stone sleeper-blocks in the Nedd Fechan Valley, provides access to the beautiful Sqwd Gwladus Waterfall. The pool of the lower weir of the gunpowder works on the River Mellte is the final destination of an exciting gorge scramble. Geotrails developed by the Fforest Fawr UNESCO Global Geopark, which are significant components of its geotourism provision, provide information and guide visitors to these sites within the Geopark's beautiful and diverse dramatic landscapes.

Tony Ramsay School of Earth and Ocean Sciences, Cardiff University & Fforest Fawr Geopak

Gorge scrambling on a winters day in Fforest Fawr Geopark.

A former tramway with stone sleepers leads to Sgwd Gwladus.

Sgwd Gwladus a destination for families and hikers in the Fforest Fawr Geopark.

Chablais UNESCO Global Geopark, France

On Your Skis!

Innovating Geoheritage Communication and Sustainable Development

One of the treasure hunt beacons and Geopark question panels. © SIAC.

Tourism has been well developed in the Chablais since the 19th century when thermal spa resorts were established in the towns of Thonon-les-Bains and Evian-les-Bains. It remains a highly visited region today; in 2016 the territory recorded almost 4.5 million summer tourist nights, with visitors attracted by both Lake Geneva as well as sports activities in the Alps. Most tourists visit in the winter with almost 7 million tourist nights recorded in the seven French resorts of the Portes du Soleil, one of the world's largest ski domains. Despite the dominance of winter visitors, until 2017 all the activities of the Geopark were scheduled for the summer months.

A formal partnership exists between the Geopark and the Portes du Soleil, the French-Swiss association that manages the ski/bike/hike area. With experience of working together in the summer, it was agreed to test a winter Geopark event.

The winter event created challenges for the Geopark. Firstly, because the international ski domain covers 650 km of pistes and 12 different village resorts, the modestly staffed Geopark Chablais team could not provide a strong presence in every resort. The second challenge was the tourist profile: not only are skiing holidays expensive, they promote a fun sport. This is not necessarily a public that is ready to invest time and energy in a cultural offer.

With these factors in mind, Geopark Chablais and the Portes du Soleil devised the idea of hosting a 2-day treasure hunt event. Free game cards were distributed to ski participants at the ticket offices and many of the ski lifts. One orienteering beacon was placed in each ski resort area accompanied by a Geopark panel with either a "True or False" or a "Did you know" fact about the natural and cultural heritage of the area. Hidden on each panel was the answer to the question. This meant that anyone reading the panel, but not playing the game was "informed" and was not left with an unanswered question.

Players were invited to ski past as many beacons as possible, reading the panel and stamping their game cards. At the end of the day participants were invited to validate their game card by answering a Geopark quiz, and by tasting the local AOP cheese.

Around 300 people completed more than five beacons and each won a free day ski pass to the Portes du Soleil ski area. Five people managed to visit all twelve beacons and were rewarded with a week's ski pass! A further 200 people visited the Geopark quiz stand over the two-day event. The event was considered a great success and is to be repeated in 2018.

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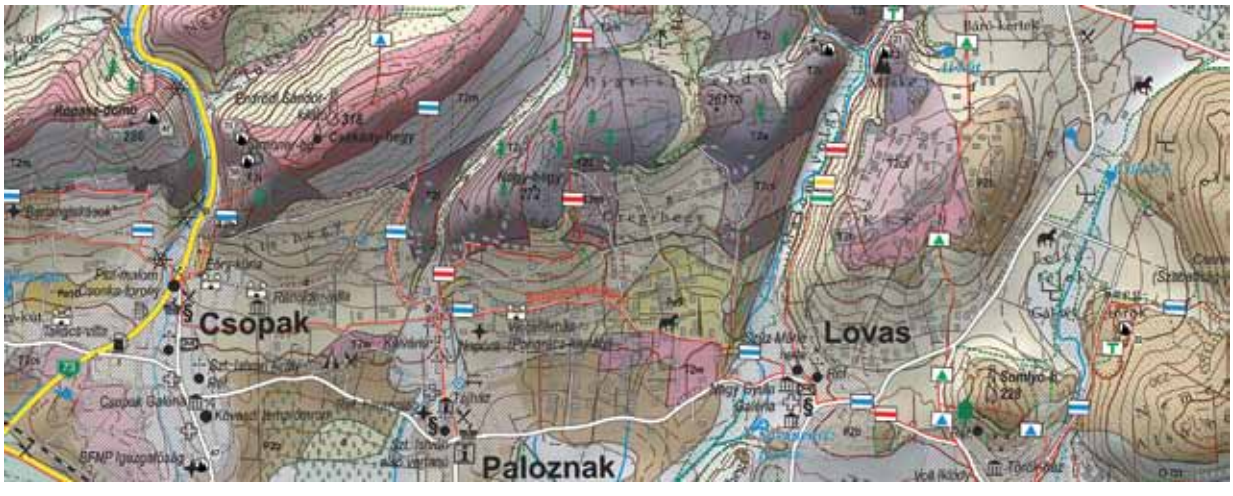
A group of happy winners. © SIAC.

The final beacon with the Geopark quiz and prizes offered by the Geopark and the Portes du Soleil. © SIAC.

Bakony–Balaton UNESCO Global Geopark, Hungary

The first geological walking map in Hungary



A detail from the map, showing the vicinity of the Geopark Headquarters. (© by Schwarcz Maps Ltd).

The Ordovician to Pleistocene sequence in Bakony–Balaton UNESCO Global Geopark contains 172 geological formations. This impressive level of geodiversity is reflected in breath-taking landscapes in which hills, the remains of ancient volcanoes, karst features, "seas of stones" and gorges are popular destinations for hikers. The Geopark contains 2,139 km of marked trails and 392 km of cycling routes: this network is an excellent basis also for geotourism.

Balaton Uplands National Park Directorate, the management organization of the Geopark, together with its partner NGOs held training courses in 10 different areas for local communities to support the expansion of outdoor activities related to geotourism. Although there are 37 nature trails (with numerous information panels) in the Geopark, guided geowalks, provided by the Geopark staff and the Geopark Partners, have become popular. Many visitors prefer learning from a dedicated guide about the geological, ecological and cultural heritage. Almost the whole area is covered by traditional walking maps but there was a need for publishing maps with geological information.

On geological maps, the geodiversity is represented as a colourful pattern, which draws people's attention and excites them because, in addition to providing scientific information, they also resemble works art. Geological walking maps with walking routes superimposed on geological and topographical information need to be carefully designed for use by non-specialists. Designing maps, providing key information, for a non-specialist audience requires a process of generalization in which a careful choice of features to be included results in an easily decipherable map.

Selecting the best geosites for inclusion in the map is a combination of geological and qualitative approaches (e.g. filtering out minor or insignificant features). The remaining landmarks have to be close to tourist facilities, but they also have to be of scenic and scientific importance.

A geological walking map was carefully compiled at a scale of 1:30,000 for the area around the Headquarters of the Geopark in Csopak Village. It is the most detailed commercial map of the Balaton Uplands with geological content depicting the results of a geosite assessment. Based on the Geopark's experiences of the popularity of the map during the tourist season it is planned to compile geological walking maps for other parts of the Geopark.

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A rock rib made up of nearly vertical beds of Triassic limestone near Felsőörs Village. (photo by Barnabás Korbély).

The Lóczy Cave in Balatonfüred. (photo by Csaba Egri).

Troodos UNESCO Global Geopark, Cyprus

The web Gis-applications are very powerful geotouristic tools for promoting the Geopark

GIS Application for the TUGG geosites.

The Troodos UNESCO Global Geopark (TUGG), located in the heart of the island of Cyprus, has been a member of the European and Global Geoparks Networks since 2015. One of the main objectives of the TUGG is to provide the visitors with adequate information and material as well as a guided tour at the Geopark's Visitor's Centre, all pertaining to the geological, mining and natural significance of the territory and its attractions. One of the comments we receive from visitors concerns the difficulties they encounter, when using a map, in locating the Geopark's designated geosites as well as the other sites of interest.

Our team decided to use technology to address this issue and guide the visitors to the geosites and the geotrails as well as to the other important elements of the TUGG area. Therefore, two ESRI ArcGIS Web Map applications were developed, one for the TUGG geosites and one for the proposed tours. In order to use these applications two geodatabases were created with spatial references, information text and images pertaining to geosites, geotrails, nature trails, UNESCO World Heritage churches, monasteries, museums, environmental centres, wineries, and more. These geodatabases were transformed in kml format (Keyhole Markup Language), which relates to the developed maps in a way that all necessary information appears on the maps in an interactive way.

The applications are run on an ESRI ArcGIS Web relief map of Cyprus. On the geosites application, the visitor can view the 62 geosites of the TUGG including the 12 abandoned copper, asbestos and chromite mines in the area. With a simple click on each point, the visitor can search for a photo and relevant information on each of the geosites in a pop-up window.

Similarly, the tours' application includes 18 choices; the visitor, with a simple click on each choice on the left side of the screen, can see details of the selected tour and simultaneously, on the right side of the screen, the route with all the stops on the map. These tours were carefully planned to connect geosites and geotrails with other significant elements of the area. By zooming in, both applications are able to display the area's satellite image in the background.

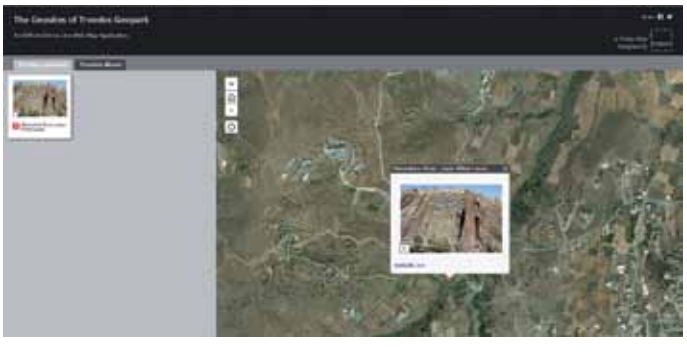
Through an interactive touch screen, both applications are available on the TUGG website as well as at the Visitor's Centre.

The above applications have proved to be very powerful geotouristic tools, giving visitors the opportunity to navigate much more easily in the area and to discover the uniqueness of the Troodos UNESCO Global Geopark.

E. Tsiolakis, Geoscientist of the TUGG

Pop up window for Geosite No3.

Satellite image of the surrounding area of Geosite No3.



Lanzarote and Chinijo Islands UNESCO Global Geopark, Spain

CACT Cognitive Challenge

The Timanfaya landscape experience. Montañas del Fuego.

Lanzarote and Chinijo Islands UNESCO Global Geopark includes Centres of Art, Culture and Tourism (CACT) within its infrastructure for tourism provision. CACT is an internationally renowned tourist model consisting of a network of sites designed to excite through art, nature and sustainability. The relationship between art and tourism on the island has supported the preservation of the landscape and has become a social, cultural and economic vector for Lanzarote. The management of these tourist centres generates employment for the local population, generates income through the sale of tickets and contributes to restoration projects as well as creating indirect employment. Approximately three million visitors enjoyed all the tourist centres during 2016. Montañas del Fuego, located in the heart of the Timanfaya National Park, was the most visited centre.

In 2016 a Cognitive Application was initiated allowing the CACT visitors to have a personal guide on their mobile phone, in their own language and adapted to their tastes or personal and professional profiles. Moreover, the Application is capable of interacting with humans, just as people do. Since it is based on cognitive technology, the application understands the national language of the visitors to the CACT, together with its richness of nuances and linguistic idioms. The App is able to answer complex questions in a few seconds, formulates hypotheses and chooses the indicated response to a question and learns from its own experience resulting from each interaction.

A moment of peace. Jameos del Agua.

Visiting a cave - the Cueva de los Verdes.

In order to improve the Application, this year we have the challenge of Geopark "CACT Cognitive Challenge Geopark" which aims to help the CACT Lanzarote (Apple Store, Google Play) application to expand its relevant information on various aspects of the Geopark, in order to improve the experience of the visitors. The challenge tries to educate, by introducing questions and answers to the Application so that visitors who use it can receive information about what they are looking for and improve their experience. The programme will be conducted in three languages: German, Spanish and English. The winning team CACT Challenge Cognitive Geopark, will receive a service contract of 100 hours in Lanzarote CACT, amounting to 2,000 € to be made over a period between four weeks and two months from the start of the contract.

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Vulkaneifel UNESCO Global Geopark, Germany

Climate change and biodiversity in focus

A Climate change manager joins the team of Vulkaneifel UNESCO Global Geopark

Representatives of the Vulkaneifel inspect an electric car as high carbon reduction investments are planned in the course of LIFE-IP ZENAPA to boost electric mobility in the UNESCO Global Geopark Vulkaneifel region.

Funding from the European LIFE-Programme allows the Nature Park and UNESCO Global Geopark Vulkaneifel to engage increasingly with the topics of climate change and biodiversity. To assist with this extensive project the office of the Nature- and Geopark Vulkaneifel GmbH created the position of a climate change manager who recently took office. The Vulkaneifel is not alone in this international project which also includes the UNESCO Biosphere Reserve Pfälzer Wald, the National Park Hunsrück-Hochwald and the municipality of Rhaunen in Rhineland-Palatinate. The project also involves large-scale protected areas from all of the eastern federal states of Germany, North Rhine-Westphalia, Saarland and from Luxembourg. The Institute for Applied Material Flow Management (IfaS), an Institute of the Trier University of Applied Sciences based at the Environmental Campus Birkenfeld is both Scientific advisor and project coordinator.

The project with the abbreviation ZENAPA (Zero Emission Nature Protection Areas) rises to the challenge to harmonise the change in generating and using energy with the different requirements of climate protection, nature- and biodiversity conservation. The Integrated Project (IP) in the LIFE sub-programme "Climate" comes with a budget of around 17 million Euros of which 8 million are funded by the EU. The rest is provided by the project partners as well as the Senate of Berlin, the KSB AG, the OIE AG and the Foundation Nature and Environment Rhineland-Palatinate. The project aims to achieve CO2 neutrality in large-scale protection areas such as national parks, geoparks, biosphere reserves, nature parks and their surrounding regions. The implementation of national and European climate targets is an integral requirement of the project.

In the coming eight years this project offers the Vulkaneifel the unique possibility to work with an international consortium to develop and implement exemplary climate change mitigation strategies. Martin Krämer is the new climate change manager and the local contact person for the project. He is based at the office of the Natur- und Geopark Vulkaneifel GmbH.

More information under zenapa.eu and www.facebook.com/ZENAPAlife

Andreas Schüller & Martin Krämer
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The successful recovery of a maar lake (Trautzberger Maar 2014), to revitalise peat growth and create a carbon sink, is planned to be repeated during the ZENAPA project.

Madonie UNESCO Global Geopark, Italy

The Sant'Otiero peak

A 230 Million year old fragment of the Tethys Ocean

The inauguration ceremony of the Sant'Otiero geological site (arrow), showing the nature of the prominent outcrop of the Madonie Geopark, along the Petralia Sottana Valley.

The mountains of the Madonie Geopark are an extraordinary archive that record the evolution of a marginal area of the Tethys Ocean during the last 220 million years. Approximately 60 geosites, the majority of which are connected by a network of 9 geological trails, document the evolution of a Bahamian-type carbonate platform and the adjacent deep-water basin from the Late Triassic and their involvement in the Maghrebian Orogeny during late Oligocene and Miocene times.

The occurrence of rocks older than the Late Triassic was the subject of debate until 2012, when the pelagic calcilutites cropping out at Pizzo di Sant'Otiero, near Petralia Sottana, were dated as Ladinian (Middle Triassic, about 230 Ma).

These strata contain rich assemblages of bivalves of the genus *Daonella*, and in particular of the species *Daonella tyrolensis* (Mojsisovics, 1874) that are typical of deep-water sediments of the Tethyan realm. In 2014 a new study based on microfossils (conodonts) has confirmed the Ladinian age of the Sant'Otiero limestones.

In Sicily the Ladinian strata are very rare since the Sant'Otiero limestone, in addition to the small outcrop of nodular limestones in the Sosio Valley near Palazzo Adriano, represents the second outcrop assigned unequivocally to this stage. The Sant'Otiero Peak (Coordinates - 37°50'12.88" 14°04' 35.44") was established as an official geosite by the Sicilian Regional Government in 2016, thanks to the endeavours of the Geosite Documentation Centre and the existence of the Madonie Geopark, the Municipality of Petralia Sottana and the Rangers of the Madonie Mountains.

The access to the geosite is via an approximately 3.5 km off-road vehicle trail that starts from the provincial road SP 54 (about 3 km north of Petralia Sottana). Interesting points to observe are the summit of the peak, where dark-grey, parallel bedded strata exhibit coquina levels made almost exclusively of *Daonella* shells. The same coquinas can also be observed on the walls of a small tool shed at the base of the peak. The limestone outcrop was exploited for the construction of the columns of the Cathedral of Petralia Sottana in 1600. The remains of columns broken during production close to the peak are a testimony to this activity.

The coquina of Daonella shells exposed close to the summit of the Sant'Otiero peak.

The Sant'Otiero limestone peak.

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North West Highlands GEOPARK
Iar-Thuath na Gàidhealtachd

North West Highlands UNESCO Global Geopark, Scotland, UK

The drive to grow a fragile economy around the geopark brand

Suilven a beautiful mountain in the North West Highlands UNESCO Global Geopark.

The yellow areas on the map show parts of the Scottish Highlands officially designated as fragile. The North West Highlands Geopark, a territory of some 2000 ^{2} kilometres and home to only 2500 people, lies entirely in this area, Fragility is defined by the distance from any urban area, with its hospitals, larger schools, retail and mainstream employment. Accordingly, the economy of our Geopark, with its stunning location, depends overwhelmingly on tourism. In common with so many other remote areas of Europe, fragility is accompanied by loss of young people and an ageing and declining population. The challenge is how to maintain our tourist economy, keep it sustainable, strengthen our communities and provide greater opportunities for young people.

Map showing the extent of fragile areas in the Scottish Highlands.

The North Coast 500 Route delivers a higher volume of tourists than we have previously experienced, though people taking the road trip do not stay very long in the Geopark. This of course does not fall within the UNESCO definition of sustainable tourism. So our challenge is to attract people to stay longer. There is not necessarily a conflict here, because business experience shows that many people who visit any beautiful location briefly will probably want to return for a longer stay.

Visitor research over the last few years tells us that people holiday here for a variety of reasons. Our geology of course, and the landscape as a whole. Outdoor activities are an attraction, for example walking, climbing, kayaking, fishing and wildlife watching. And let us not forget excellent local food and drink in high quality accommodation. None of this will come as a surprise to any fellow member of the Geoparks Network.

A UNESCO Global Geopark is privileged to have access to a brand of unique quality. Over the coming year we will be working hard with businesses in the Geopark to develop that brand, with the aim of becoming a destination of choice for those who do not yet know what a Geopark is. Our intention is to ensure that we are known, that people will understand what to expect when they arrive, and that their expectations of "slow tourism" are met.

We have decided to extend this year's highly successful October Geofestival to run throughout the 2018 tourist season, collaborating with partner businesses to promote a wide range of outdoor activities. We will be developing a Geofood network with quality producers, caterers and accommodation providers. We will also be supporting our many craft and art businesses with organized trails to help them bring their work to market. All of this building on the opportunities offered by our incredible landscape and wonderful people. Why not come and visit?

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UNESCO Global Geopark Harz Braunschweiger Land Ostfalen, Germany

Steles right in the middle of the Geopark Information for visitors and inhabitants

It is a symbol of pride for what has been achieved: the visibility of a UNESCO-Geopark. Visitors being able to spot where the area of a Geopark begins is often considered of paramount importance. For that reason, welcome signs are normally positioned along the roads and motorways that lead travellers into the Geopark area. The UNESCO Global Geopark Harz. Braunschweiger Land. Ostfalen has 1.5 million inhabitants. How will they know that their village or town is part of a Geopark? Surveys conducted within the Harz Mountains revealed that the Geopark has a high profile amongst visitors. Inhabitants, however, are often amazed when they notice reports about the Geopark in newspapers, radio and television stations. At best, they have noticed one or two Geopark information panels or joined a guided hiking tour. But is this enough for local inhabitants to identify with the UNESCO-Global Geopark?

This is why a new idea involving the placement of steles in communities is now being gradually put into practice in the UNESCO Global Geopark Harz. Braunschweiger Land. Ostfalen. Their shape is reminiscent of historical milestones or boundary stones, so-called "triangular posts". The two sides facing the road contain GEOPARK in large capitals. The lettering, easily readable by pedestrians and passing motorists, is supposed to intrigue. It is meant to motivate motorists to gather information on the aims and objectives of a Geopark. Perhaps next time they will stop and take a closer look at the stele. Each stele is mounted on a concrete base resting on a gabion, a wire cage filled with rocks characteristic of their respective location. The side facing away from the road, easily accessible for pedestrians, displays a Geopark information panel. It explains the geological foundations of its location and the rocks exhibited within the gabion. The displayed rocks were originally used for the construction of buildings in the respective location. They are often still visible in the un-rendered brickwork of buildings or city walls. The source of these rocks which has often been forgotten, is also identified in the panels. Memories of the positions of disused quarries, are recalled together with the trading connections between the region's larger cities and villages. After the first two steles were erected in 2016, the Geopark's Branch Office in Quedlinburg received numerous requests from local politicians, enquiring if it would also be possible to erect a Geopark stele in their city or community. Whenever funding is successfully secured, e. g. by making use of funding programmes such as LEADER in the state of Saxony-Anhalt or Landschaftswerte ('landscape values') in Lower Saxony, a new Geopark stele is erected. At the end of the year 2017, there were already eleven steles in place. Further steles are in the process of planning.

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The side of a Geopark stele facing the road, 21st century.

The side of a Geopark stele facing the sidewalk.

One of the sides of a boundary stone, 18th century (Brunswick Dukedom)

naturtejo GEO.PARK

Naturtejo UNESCO Global Geopark, Portugal

New interpretation of Gold Mining

Site of the Conhal do Arneiro Roman Gold Mine.

The signs of ancient mining are still evident in the landscapes of UNESCO Naturtejo Global Geopark. In this unique cultural landscape, the traces of mining activity date back to the Iron Age, creating legends and memories that survive to the present day.

Extracting gold from extensive placer mines in the alluvial deposits of the Tejo, Ponsul and Erges rivers, mainly during Roman times, led to dramatic changes in the landscape. The legally protected Conhal do Arneiro National Monument, an area of 0.7² kilometres situated in a graben, contains tailing piles, channels, mine cuts and settling ponds. The site, one of the most iconic examples of Portugal's mining heritage, is of considerable cultural value. Nowadays it is possible to observe enormous aligned conical piles of pebbles created by washing the pebble beds from the Tejo alluvial plain through complex hydraulic circuits.

The recently opened Conhal Interpretation Centre, situated within an old school building, contains a permanent exhibition dedicated to Conhal do Arneiro Gold Mine, the Portas do Ródão Natural Monument and Tejo River. It connects geodiversity and biodiversity with archaeology (artifacts from the first Palaeolithic inhabitants) and traditional communal activities including fishing and other crafts. A multimedia room, a room for temporary exhibitions, a pedagogical room for educational and playful activities and a place for complementary educational and tourist activities are also provided.

The Conhal do Arneiro geo-monument, already accessible through the 10 km walking trail "Conhal Trails", connects the main viewpoints, continues into the mining area and its most important sites, and provides an understanding of the complex Roman mining techniques. These techniques can also be seen in several mines in the Naturtejo Geopark, such as Conheira de Foz do Cobrão-Sobral Fernando, Gorroal da Veiga, Presa Mining Complex, situated on the Tejo, Erges, Ocreza and Ponsul river terraces. The river terrace deposits were exploited initially by the people during the Calcolithic (Copper Age) and then by the Romans. The ancient mining activity in the *Aurifer Tagus* region has been a part of the memories of the local inhabitants for many generations. "Panning for Gold" is now a tourist and educational activity in the Geopark in which participants experience techniques developed over thousands of years for exploiting geological resources. The Naturtejo Geopark Educational Programmes address mining heritage and geological resources at different levels in the school curricula.

The new exhibition "Gold: From the Formation of the Universe until the Conquest of Space" was opened in July as part of the celebrations for the 10th anniversary of the Centre for Living Science of the Forest. The origins of the element gold beyond the Earth, its properties, and its applications, the stories of mining in this region of the Geopark, even to its use in technology related to space exploration are all linked among real gold nuggets and the reconstructed mine shaft.

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Conhal Interpretation Centre entrance to the exhibition dedicated to Conhal do Arneiro Gold Mine.

An educational game in Conhal Interpretation Centre.

Shetland UNESCO Global Geopark, Scotland - UK

Peatland Restoration

heritage Shetland culture
Geopark Shetland

Two Cotton Grass *(Eriophorum)* species grow on Shetland's peatlands, creating a spectacular sea of white in summer. (Photo by David Gifford)

The importance of rainforests in the planet's carbon cycle is well known, but humble peat-bogs actually hold more than three times as much carbon as the rainforests, helping to protect our planet from climate change. The UK's peatlands are a huge carbon store, with an estimated 3.2 billion tonnes locked away within them. Peat is formed mostly from *Sphagnum* mosses and cotton grass (*Eriophorum*). Scotland's peat soils contain almost 25 times as much carbon as all other plant life in the UK.

Over half of Geopark Shetland's area is covered in peat. The type of peatland that cloaks our hills – blanket bog – is an internationally important wildlife habitat. In good condition, with an active growing layer of *Sphagnum* moss, it not only sequesters and stores carbon, but also regulates water flow and purifies water. Damaged peatlands, however, cannot deliver this range of benefits and will release carbon dioxide into the atmosphere.

The Scottish Government recognises the many benefits of peatland restoration and has set a target of restoring 20,000 hectares of peatland this year in Scotland. Peatland restoration in Geopark Shetland has been kick started over the last three years by funding from Scottish Natural Heritage's Peatland Action Fund, which has provided money for a Project Officer and three projects, benefitting around 150 hectares of blanket bog.

Blanket_Bog - One of the peatland restoration sites in Geopark Shetland. The darker areas are erosion gullies and patches of bare peat. Photo by Rory Gillies.

***Sphagnum* moss - the main constituent of blanket bog - which can retain 10 times its weight in water. Photo by David Gifford.**

Tackling the many hectares of erosion gullies, which remove water from the hill and dry out the bog, can be a daunting task. Large bare areas of peat get washed away throughout the winter, while peat literally blows away during brief, dry spells in the summer. The key to its restoration is to raise the water table so that bog vegetation, including the vital *Sphagnum* mosses, is able to grow again.

Transport costs of materials to Shetland, in terms of both money and the carbon footprint, are high, so we took time to explore our own locally applicable solutions for peatland restoration. As a result, we now make use of abundant waste materials from the salmon-farming industry. We have demonstrated that even highly degraded bog in exposed conditions can be restored using straightforward techniques and locally available materials.

A visit to one of our projects will reveal that erosion gullies have become chains of pools full of *Sphagnum* mosses, bare peat has been wetted and stabilised, and vegetation has started to recover. Significantly, important bird species, such as Red-throated Diver, Golden Plover, and Dunlin, have also returned to breed on sites that have been recently restored.

The peatland restoration project is building momentum; work has just commenced on another two restoration sites and three more are in the pipeline, for completion before March 2018.

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Magma UNESCO Global Geopark, Norway

TROLLpikken

Geological heritage protection

The Geopark site "Trollpikken", which translates as "the Troll´s penis", lies between Kjervall and Veshovda in Magma Geopark's - Eigersund municipality. About 110,000 to 10,000 years ago, most of Norway was covered by a large ice sheet up to several kilometres thick. At the end of the last Ice Age the ice retreated and advanced at different times. Melting water from the retreating glacier penetrated fractures in the rocks which expanded in response to the pressure exerted by the production of ice during freeze thaw cycles. Fracturing was also facilitated by the reduction in pressure resulting from unloading by removal of the ice. These two mechanisms, together with a bit of luck, created the special and unique rock formation called Trollpikken. The Trollpikken has stood erect since the end of the last Ice Age – almost 10,000 years ago and, together with the Pullpit "Prekestolen", Kjerag (the rock) and The Troll's tongue "Trolltunga," is one of the most famous rock formations in the Rogaland County. These four formations are part of the regional tourism provision for the strategic promotion of the geological heritage of Rogaland County. Trollpikken is considered to be the most amusing of the four "tourist rocks" attractions.

During the night of Saturday June 24th 2017, the rock formation fell victim to an act of vandalism. It was broken loose at its base by mechanical force and the use of tools. That same morning, the projecting stone boulder, with a weight of 12 tons, was found lying intact right below its base.

To get the formation back in place, three holes were drilled into the base and and a 10 m high and 2.2 tons framework was built up around the block to support the hoists. Subsequently, straps were attached around the collapsed Trollpikken and it was lifted into place. Three iron bars, each 4 m in length, were inserted through the holes in the block and into the base. During the final stage the fracture zone was reinforced with epoxy resin.

The Magma Geopark's job, focused on increasing the people awareness's of the unique geological heritage, instigated an immediate fundraising campaign to raise the Trollpikken. The target of 125,000 Euro was achieved, thanks to a substantial contribution from the Eigersund Municipality. On July 6th 2017, a local construction firm started the restoration and around 17:00 o´clock on the following day Trollpikken once again stood erect in the landscape - only 14 days after the vandalism! If Trollpikken wasn't known before, it certainly is known now!

People came from near and far to get a glimpse of this prominent feature in the Magma UNESCO Global Geopark.

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Rokua UNESCO Global Geopark, Finland

Develops and publishes new information products

A visitor demonstrates the Rokua Geopark's published Mobile Application.

Rokua Geopark developed a Mobile Application and published four new Trail Guides in 2017. These information products are the beginning of a new approach for the Geopark to inform and engage with the public. The mobile app and the trail guides provide detailed information about the geology, culture, services, accessibility, location and difficulty of the trails.

New trail maps for Rokua UNESCO Global Geopark.

The new trail guides have been prepared for the most popular sites and trails in the Geopark. The guides combine detailed explanations of the sites and a map that provides a good overall picture of the terrain and the location of sites of interest. The trail guides make the planning of a trip easier and more interesting for visitors. The model for these products was developed partly from the model developed by Fforest Fawr UNESCO Global Geopark,UK, Wales which one of the authors experienced during a Revalidation Mission in 2016.

Together with the new trail guides the Geopark published a Rokua Geopark 3D Mobile app in May 2017. The mobile app with interactive 3D models explains Rokua Geopark in a modern way, and makes it easier to share with visitors and residents up-to-date information on services and sites. In the mobile application visitors can explore landforms, attractions and tourism services with respect to their own locations recorded on a three dimensional map. The application presenting the Geopark and its sites can be downloaded from the Google Play and App Store. By October 2017 the application had been uploaded more than 3300 times on mobile devices.

The application and the guides were prepared together with the local communities. During the development meetings the representatives of the communities considered the best local attractions and services to be published in the guides. They also gathered old stories and legends from the nearby region. Thanks to the local inhabitants the completed guides share multidimensional information beginning from the geology of the region and ending with cultural legends and myths associated with the paths and geosites. Contributing to the preparation process and to the contents of the guides increased the Geopark's inhabitants sense of pride in their home region. The guides are now very popular with visitors, and also with the local people.

Rokua Geopark tells the history of the last Ice Age and the outstanding landforms shaped by the melting glacier. The characteristic features of the area are the glacial ridges with kettle holes and fossilized dunes. Little streams have carved their deep valleys into the soft glaciofluvial deposits with several hummocky moraines and drumlins which are surrounded by endless aapa mires, characterised by minerotrophic fen vegetation. Rokua Geopark also includes fascinating cultural sites which have a history dating as far back as 8500 years.

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PARCO NAZIONALE delle COLLINE METALLIFERE GROSSETANE
TUSCAN MINING GEOPARK

Tuscan Mining UNESCO Global Geopark, Italy

Sustainable development activities

Since becoming a member of the European Geoparks Network in 2010 the Tuscan Mining Geopark has implemented many projects concerned with sustainable development. In 2014 the Geopark joined the **European Charter for Sustainable Tourism in Protected Areas** (ECST) project with an action plan which involved implementing 46 actions over a period of five years. The plan was signed by approximately 30 public and private organizations. Seventy percent of the actions were realized within the first 3 years, and 31 new actions have been proposed by nine new public and private organizations who want to join the process. These concern the efficiency of accommodation facilities, the construction of cycle paths, the maintenance and cleaning of hiking paths by private individuals, projects to promote total accessibility and the inclusion of minorities by creating "social vegetable gardens".

Thanks to this work, the Geopark was selected by **Federparchi - Europarc Italy** to participate in an INTERREG funded MED Programme **DestiMED a** prestigeous project which aims to create preconditions for destination management.

The Geopark is now one of 13 Mediterranian territories which are engaged collectively in developing, managing and promoting ecotourism throughout the region by delivering sustainable tourism packages with a low CO2 impact. The tourism package of the Tuscan Mining Geopark, created with the help of the European Charter for Sustainable Tourism Forum, will be evaluated in autumn 2017 and in spring 2018.

As part of the activities of the European Charter Forum, the Geopark has organized the first of a series of ecodriving courses for Charter subscribers. This involves theoretical and practical training which, by using a driving simulator, develops a driving style leading to a reduction in fuel consumption and CO2 emissions of up to 20%. After an exam, a certificate was issued to 12 participants.

Sustainable tourism in the Geopark. Cyclists wait in turn for a guided tour in Gavorrano Mine.

The promotional poster for the event "Flour in your sack" concerning the use of ancient cereal crops in cooking highlighting exhibitions and workshops supported by DRAGO and the Tuscan Mining Geopark.

FREEWAT, funded by the HORIZON2020 programme involves using QGIS software, an Open Source Geographic Information System, to generate models for aquifers. These models can contribute to groundwater management and enable the simulation of the effects of prolonged drought and/or over-exploitation on groundwater supply. The Follonica Aquifer, situated in the Geopark, is one of the case studies in this project. The Geopark has supported the Tuscany Region in organizing seven Focus Groups, which were attended by many stakeholders from the area (farmers, tourism operators, industries, local authorities).

On October 6, 2017, the Geopark signed a letter of support for the Organized Rural Agricultural Gastronomic District Project (**DRAGO** meaning "drake"), which involves a network of local farms and companies in the cultivation of ancient grains for producing flour, bread, pasta, biscuits and sweets. This important economic and sustainable project will, by reclaiming the production of ancient almost completely forgotten crops, support small agricultural enterprises and contribute to the preservation of the genetic diversity of cereal crops.

Delivering the ecodriving course at the headquarters of Tuscan Mining Geopark.

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Vikos-Aoos UNESCO Global Geopark, Greece

Essential part of the forthcoming Epirus trail

A hiker crossing a bridge on the Epirus Trail.

The 370 km Epirus Trail is one of the longest hiking trails in Greece. It crosses the Northern and Central Pindos mountains and was designed by the Region of Epirus. Vikos Aoos Geopark is an essential part of the Epirus Trail since more than 50% crosses the Konitsa & Zagori municipalities within the Geopark's territory. The Epirus Trail starts from Mount Grammos, the NW point of the Vikos Aoos Geopark dividing into a northern branch which crosses Mount Smolikas and a southern branch traversing the Vikos and Aoos gorges and Mount Timfi. It then leaves the Geopark and continues SE to Mount Metsovo and Mount Tzoumerka.

THEN

These footpaths used to be the road that the "famous" benefactors of Epirus followed in order to make a journey abroad and contribute to the development of their birth place with great construction works and donations. These paths were used by the hardy sheep owners and shepherds from the mountains to drive their large flocks to the plain of Konitsa or to the the peaks of Epirus and Pindos. Thus sheep drovers carved smaller and larger roads in the landscape which were used by travellers on foot or in carriages. That's how the trails we now call "paths" were shaped.

One of the spectacular views along the Epirus Trail.

TODAY

Today, hiking in the landscape is constantly evolving, and in European countries the expansion of this activity over a long period of time has developed as an important component of the tourist industry.

The Epirus Trail Project is essentially about promoting the old road arteries along which people from Epirus, and what is now the Vikos Aoos Geopark, travelled for centuries to access mainland areas in Greece, or other countries. The areas crossed by the Epirus Trail include sites of exceptional natural beauty, unique landscapes, and an interesting man-made environment with unique cultural elements. The broader design of the Epirus Region aims to develop hiking - and, more generally, alternative tourism - as another development tool for the region. To this end, the creation and certification of the Epirus Trail is of great importance, incorporating the concept of the old paths into the modern tourist market. The trails that traverse history and culture, will raise the senses of the hikers and will enrich their souls with the knowledge acquired while using them.

The construction of the Epirus Trail, titled "The Route to culture, history and legends", is a high priority project for the Region of Epirus, which as a member of the Vikos- Aoos Geopark committee, the Epirus Development Agency S.A and the management body of the Vikos-Aoos Geopark collaborates in protecting and promoting the Geopark's values and in improving the services for the Geopark's visitors.

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Burren and Cliffs of Moher UNESCO Global Geopark, Ireland

Geopark LIFE

An EU funded LIFE programme on tourism and conservation 2012-2017

Sustainable transport initiatives

Award winning products.

The Burren and Cliffs of Moher UNESCO Global Geopark was awarded EU LIFE funding of €1.1 million in 2012. Matching grant aid was provided by the project stakeholders from the tourism, conservation and academic fields: Clare County Council, Geological Survey of Ireland, Fáilte Ireland, National Parks & Wildlife Service, National Monuments Service, Office of Public Works, Heritage Council, National University of Ireland Galway and University College Dublin.

As well as those national statutory agencies and universities, local businesses (members of the Burren Ecotourism Network), community groups (Kilnaboy, Ballyvaughan) and individuals (landowners) were significant contributors to the development of the project.

The final project conference took place in Ennistymon on 23rd November and the programme ended in December 2017, so it is timely to review the key points of the project here.

GeoparkLIFE is a tourism for conservation programme established by the Burren and Cliffs of Moher Geopark to seek a collaborative balance between the tourism interests and the conservation needs of the Geopark region.

The Objectives:

- To work with tourism businesses in developing a sustainable code of practice for their business.
- To work with tourism and conservation agencies to develop integrated management systems at sites of high conservation value.
- To work with all groups to test policy and to influence the integration of those policies.

The Approach:

- Creating platforms for collaboration between all stakeholders.
- Allowing time to build relationships.
- Creating a vision.
- Providing leadership and facilitation structures.
- Focusing on practical actions and measured outcomes.

The Outcomes:

- Increased and continuing **collaboration and understanding** between stakeholders.
- A **destination approach** to sustainable tourism.
- Award winning sustainable **tourism products.**
- **100 businesses** implementing environmental practices.
- **A Code of Practice Toolkit** that generates environmental, social and economic gains for tourism businesses.
- A model for **business-to-business networking** and referrals.
- **Monitoring and data management tools** for heritage sites and trails**.**
- **Baseline data** for visitor numbers

AfterLIFE:

LIFE programmes require future planning to support the outcomes beyond the timescale of the programme and to this end we will build on our progress and continue our integrated management approach with all stakeholders in the Geopark.

The GeoparkLIFE Laymans Report, Guideline Documents, Case Studies and other reports are available online at www.burengeopark/geopark-life.ie

The GeoparkLIFE programme was an EU funded programme. LIFE is the EU's financial instrument supporting environmental, nature conservation and climate action projects throughout the EU. For the 2014-2020 funding period, LIFE will contribute approximately €3.4 billion to the protection of the environment and climate change.

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Massif des Bauges UNESCO Global Geopark, France

"Geoborne"

A discreet and powerful tool for high definition contents broadcast in remote areas

The "Geoborne" on Prerouge Geosite (Solar/ Battery version).

The need for interpretation media in remote areas (white zones or places exposed to degradation) has been solved with the installation of two experimental "geobornes". This innovative concept of coupling a micro mysql server with a local WiFi transmitter enables the Geopark to display a comprehensive management system (CMS) to the general public by using their own display systems, tablets or smartphones. The Massif des Bauges Geopark (Savoie, France) is experimenting, at two sites, with this tool created by the French start-up company "Créatronique". The Geoborne can be powered by either a photovoltaic panel, battery pack or AC power. It broadcasts for free (without data consumption) high definition data (HD video, rich slideshows or all types of files hosted by dynamic or static websites). The visitor can connect to the local WiFI Geoborne network and surf the local web content with a web browser. The content of our presentation application (Geocorner) was customized and enriched with a presentation of the respective geosites. In addition to the basic content, we propose for each of the two equipped sites a short video to show images that usually cannot be seen; examples include caving, flood sources, drone flyovers and high line performers.

WiFI information for the public.

The entrance of the Prerouge Cave is equipped with an autonomous Geoborne (photovoltaic panel + Pb Battery). It broadcasts a virtual visit to the cave with images of cavers, underground diving or exceptional flooding. These dynamic images reinforce classic panels available on the site. All the equipment is out of reach and installed on a pre-existing pole.

The canyon of the Abime's Bridge is the second site where a Geoborne was established. The presence of AC power and risks of damage led us to choose a Geoborne connected to the electricity grid. The equipment is, in this case, totally hidden.

Visitors are invited to connect via an advert in the interpretation panels with a WiFI logo and a short introductory text.

These attractive contents allow visitors to experience our network of Geosites and encourage them to visit our website with its dynamic cartography of the whole network. Dedicated videos are also available on the Parc des Bauges website (www.parcdesbauges.com - Geosites section). These feedbacks contribute to create an attractive and comfortable environment in which to discover what the Geopark has to offer. Inventors of the Geoborne have recently received an award during a start-up competition in the city of Lyon.

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The cocealed "Geoborne" near the Abime Bridge Canyon (connected to the electricity grid).

GEOPARK KARNISCHE ALPEN
ABENTEUER ERDGESCHICHTE

Carnic Alps UNESCO Global Geopark, Austria

Cephalopods named "Orthoceras"

Travelling in deep time: Unique remains from the Silurian sea

The preparation of the *Orthoceras*-bearing rock slab outside the city hall of Kötschach-Mauthen by Gerhard Koch, Graz.

During the summer of 1987 an almost 200 kg heavily weathered limestone slab packed with fossils of marine organisms that lived in the Silurian sea of the Carnic Alps area over 400 million years ago was discovered at an altitude of some 2000 m on the southern slope of Mount Rauchkofel. It was transported by helicopter to the Gail Valley and its final destination in front of the Kötschach-Mauthen City Hall. The geologist and sculptor Gerhard Koch from the city of Graz polished the fossil bearing parts of the limestone revealing numerous specimens of the cephalopod "*Orthoceras*" with evidence of post-mortem and fossilization processes.

Orthoceras, a distant relative of the squid, is a cephalopod characterized by a cone shaped shell which is subdivided into a series of chambers. The final and largest chamber housed the tentacle-bearing head and was connected to the earlier gas filled chambers by a tube known as the siphuncle. By controlling the salinity and volume of water and gasses in the chambers, *Orthoceras* was able to regulate its buoyancy and either rise or sink through the water column. Like modern day squid, *Orthoceras* moved by jet propulsion by exhaling water through a siphon.

A study of the taphonomy, the processes that occurred between death and its recovery as a fossil, of one of the *Orthoceras* specimens suggests that the fragmentation of the walls (septae) between the latest chambers occurred after death when the shell sunk to the sea floor. The fragmentation is attributed to the implosion of the septae when the pressure inside the chambers could not equilibrate with the outside pressure. However, in contrast, it is possible that the first-formed apical septae might be intact. The depth at which implosion occurred, whether at some hundred meters or less, is open to speculation. In addition, another *Orthoceras* shell

Longitudinal section of the 65 cm long *Orthoceras* shell. The left part of the fossil shows the fragmented walls between the chambers. The rest of the chambers are intact. The specimen is overlain by another *Orthoceras* fossil.

Detail of the imploded exterior part of the shell and parts of the constricted siphuncle. Photo: H.P. Schönlaub.

can be seen lying directly on the shell with the fractured septae. It is possible that the compression of the shells during burial may have contributed to the fragmentation process. However, given the availability of only one or two specimens, this cannot be determined with any certainty.

Following the decay of the soft parts and during burial, black mud started to fill the youngest part of the shell. Slowly calcium carbonate saturated water began to penetrate the chambers and precipitated thin fibrous calcite crystals followed by large crystals of white calcite that filled the remaining empty parts of the chamber.

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Geoconservation of Fuentelsaz's Stratotype Natural Monument

The information panel next to the GSSP area.

The exceptional Lower – Middle Jurassic outcrops in the Fuentelsaz Section, located in the Castilian Branch of the Iberian Range (Guadalajara, Spain) resulted in its designation by the International Commission on Stratigraphy as the Global Boundary Stratotype Section and Point (GSSP) for the base of the Jurassic Aalenian Stage.

The sediments of the Toarcian–Aalenian transition, the boundary between the Lower and Middle Jurassic, at Fuentelsaz consist of marls with interbedded limestones in rhythmic alternation. The GSSP was designated during the International Geological Congress held in Rio de Janeiro, Brazil in 2001. The placing of the boundary was marked by a "Golden Spike Ceremony" in 2016, and in 2017 the Fuentelsaz Section was declared a Natural Monument by the Regional Government Environment Department, following the advice of the Geopark's Scientific Advisory Committee with contributions from the Geopark's Management Team and other institutions.

Geoconservation of this internationally important site involves a programme that takes into account the significance of the rock section and includes participation of the local community to ensure its future conservation and contribution to knowledge.

The affiliation of this territory within the UNESCO Global Geoparks promotes the sharing and investigation of geoconservation experiences all around the world. After analysing the special features of Fuentelsaz GSSP Stratotype, it is concluded that some actions are much more useful than erecting a physical barrier when the importance of the site is hard to understand by tourists or even local inhabitants. The actions implemented in order to accomplish an efficient management of this important site are as follows:

Signage:

Several kinds of signpost are designed in order to suit the different requirements of this geosite: Some directed at the scientific community include panels in English, ceramic tiles or the obligatory golden spike. However, others explain the nature of GGSP's through drawings and simple words making the GSSP concept understandable for local people and visitors.

Building an interpretative area:

Since it is desirable that people don´t walk over the sensitive area and don´t collect samples without permission, the Geopark and the municipality of Fuentelsaz converted an old waste dump to create an interpretative area, equipped with panels and benches, where visitors can admire this heritage from a distance.

Informative talks and guided visits:

Designed for local people and holiday visitors, and delivered by scientists. The talks and guided visits are a successful means to communicate with the local people and visitors.

Building a museum and interpretative centre:

The restoration of a sixteenth century house created an indoor space for explaining the nature of the GSSP and for exhibiting important local fossils, minerals, archaeological remains and other related materials.

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Constructing the interpretive area for the Fuentelsaz Stratotype section.

Showcases in the Fuentelsaz Museum.

Reykjanes UNESCO Global Geopark, Iceland

We have good stories to tell

Brimketill is a small pool created by marine erosion, at the lava shore edge west of the town of Grindavík. The folklore relates that the pond was regularly used as a bath by a giantess named Oddný.

In 2016 the municipalities within the Reykjanes UNESCO Global Geopark as well as local companies in the region joined to inform the Icelandic public about the Reykjanes Peninsula and inspire the inhabitants, with the aim to strengthen the image of the region, attract new people into the area, increase the number of employees and stimulate the local spirit of the community.

The unemployment rate has decreased rapidly within the last few years in the Reykjanes UNESCO Global Geopark from 14% in 2008 to 1,5% in 2016 - creating new and unexpected challenges for industries and municipalities. Instead of creating new job opportunities, the area needed more people.

Icelanders like telling stories

The results of a study of the common perception of the Reykjanes Peninsula, published in 2015, indicated that the region was considered to be the least attractive area to work and live in Iceland. The reasons were centered mainly around the general image of the area, with people highlighting previous negative impressions such as the location of the US NATO base, a high unemployment rate, a low educational level, a negative public relations image, as well as its perception as an unattractive natural environment.

The first major task of Reykjanes Geopark after becoming a member of the EGN/GGN was to challenge the negative impression of the region and change the ideas Icelanders had about the territory. A major step towards achieving this goal was a project launched in 2016 in cooperation with Visit Reykjanes, local municipalities and companies in the region, named "REYKJANES – WE HAVE GOOD STORIES TO TELL". The project focuses on telling good stories from the local community in Icelandic media and creating an awareness of the positive initiatives in the area. Icelanders are a nation of folktales. They like telling as well as hearing good stories.

Reykjanes Geopark had a positive impact

Reykjanes Geopark had a positive impact on the perception by telling good stories about the regions nature, history and people. One of these stories, for example is about a diver who collects shellfish for his parent's restaurant. Another concerns a giantess who used to take a bath in the geosite Brimketill.

At the end of 2016 a new study indicated that the project had a positive impact on the common perception of Reykjanes Peninsula. It has also strengthened the image of the region and built up the self-esteem of the local community. With this outcome from the project after only one year in operation the stakeholders decided to extend the project into 2017 and following another positive year of operation it has now been extended into 2018.

Just as we have good stories to tell, we would love our visitors to tell us their good story following an enjoyable stay.

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Pollino UNESCO Global Geopark, Italy

Receives a new UNESCO award for the ancient beech forest of Cozzo Ferriero

The primeval beech forest, *"old-growth forest" of Cozzo Ferriero*, now a UNESCO World Heritage Site.

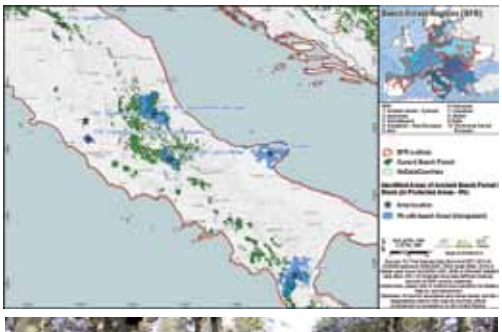
Since becoming a UNESCO Global Geopark, the Pollino National Park territory has achieved a new prestigious award: the ancient beech forest of Cozzo Ferriero in the municipality of Rotonda was included in UNESCO's list of World Heritage Sites.

On the 7th July 2017, during the 41st session of the World Heritage Commission in Crakow, Poland, the World Heritage Site - "Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany (Germany, Slovakia, Ukraine)" was extended to include the territories of 14 countries and entitled *"Primeval Beech Forests of the Carpathians and Other Regions of Europe"*.

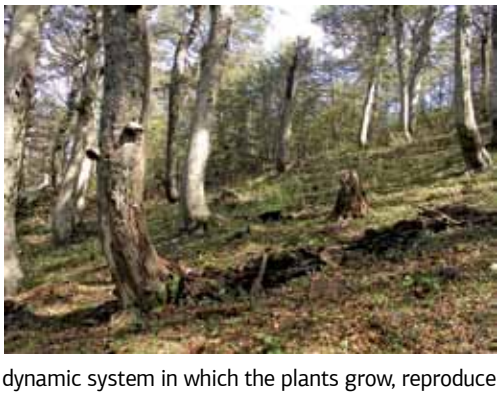
The beech forest of Cozzo Ferriero, the southernmost European site, occupies the crest and steep northwestern slopes of the Coppola di Paola Mountain in a remote area unexploited by humans for the last 80 years. The predominanly limestone bedrock and complex terrain form a ridge (1,750 -1,900 m above sea level) which separates the Basilicata and Calabria regions.

The ancient, or old-growth forest of Cozzo Ferriero, characterized by trees up to 400 years old, is situated in a glacial refugial area at the upper limit for the occurrence of beech trees. Here populations of beech trees, which persisted through the Pleistocene ice ages, represent the frost-resistant broadleaved deciduous components within a slow-colonizing contingent of nemoral species. Nowadays these are restricted to the Southern Apennines and are adapted to a climate characterized by drought, late frosts and strong winds.

The lack of human activity, mainly logging, in the ancient (or "old-growth") beech forest over several decades or even centuries has resulted in the development of almost untouched virgin forests. For beech forests, this includes trees that are significantly older than the ages of trees subjected to the usual 100 – 120 year period of logging rotation. Consequently areas of deadwood over an area of 20 m^3 have already developed and the forest is now a dynamic system in which the plants grow, reproduce and die naturally. Indeed, the Cozzo Ferriero is an example of excellent environmental quality, thanks to the presence of many flagship species indicators of old-growth status: the bat *Barbastella barbastellus*, the birds *Dryocopus martius*, *Dendrocopos medius*, *Ficedula albicollis*, typical deadwood insects like *Rosalia alpina* and *Cucujus cinnaberinus*, lichens like *Lobaria pulmonaria*, and many fungi like *Fomes fomentarius*. This forest, in addition to its scientific importance, is certainly a fascinating and new point of interest for sustainable tourism within the geopark.



The distribution of beech forests in Italy.



An example of a habitat in the "old-growth" forest of Cozzo Ferriero.

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Parc naturel régional des Causses du Quercy

Causses du Quercy UNESCO Global Geopark, France

A stony land with hidden treasures

The iconic village of Saint-Cirq Lapopie which is also a geosite that bears witness to the geological history of the "Causses". ©zmz.fr

"Causses du Quercy" are a group of Jurassic limestone plateaus which recently became the sixth French UNESCO Global Geopark. Situated between the Massif Central and the Aquitain Basin, in the southwest of France. The Causses du Quercy Geopark brings together 95 municipalities and provides many stories from its geological history that began 200 million years ago.

A "natural laboratory for evolution"

As the result of unique geological circumstances, Causses du Quercy Geopark has one of the world's five longest palaeontologically continuous continental sequences, between 52 and 20 million years, contained within different phosphorite caves. This exceptional paleokarstic heritage is of great scientific interest because of the number of fossils and the 3D quality of their extraordinary preservation. They make it possible to reconstruct the evolution of life, the climate and the terrestrial ecosystems for the upper Paleogene. Labelled as a "natural laboratory for evolution" by scientists, this exceptional geological heritage was designated as a National Nature Reserve in 2015 in order to insure its protection.

A strong "caussenard" identity

The Causses du Quercy identity is built on a long-term link between man and limestone. In this stony landscape, the whole area is shaped mainly by a network of dry stone walls, dovecotes and stone huts, many small hamlets and traditional peasant architecture, ponds cut into the rock, countless megaliths and painted caves - so many expressions of this close connection between the karstic features of the "Causses" and its inhabitants over the millennia.

With 30,000, inhabitants within 185,000 km^2, Causses du Quercy Geopark is a rural area; tourism and agriculture constitute its main economic sectors. Its development, since 1999 as a Regional Nature Park, was mainly instigated and promoted by local participants and partnerships. The project design is based on the enhancement and preservation of the natural and cultural heritage. Inevitably the Regional Natural Park was the lead partner in the Causses du Quercy Geopark project.

A geotourist destination

As a genuine "outdoor museum", Causses du Quercy are known for the beauty of their landscapes where dry habitats, forests, rare rivers intertwine and small authentic villages have been preserved. Historically, there is a local form of tourism focused on Causses du Quercy's geological curiosities at several important national tourist sites including Pech Merle prehistoric painted caves, Rocamadour pilgrimage village, the picturesque village of Saint-Cirq Lapopie, and Cloup d'Aural phosphate mines.

The Geopark has worked with its partners for a number of years to enhance the visibility of the Causses du Quercy's Geopark and to contribute to many projects involved in expanding the range of tourism provision within the territory. This involves training and support for the local tourist accommodation providers, local networking, interpretation and promotion tools, hiking and biking trails and the improvement of the provision at geosites.

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The phosphorite caves contain the famous fossil deposits; they are also the vestige of the territory's mining past. ©Lot Tourisme – P. Lasvenes

"Bachitherium" is an Oligocene mammal; it gets its name from "Bach", a little village in the south of Geopark where fossils of this animal were first discovered. ©Maeva Orliac

Las Loras

A new Spanish UNESCO Global Geopark

The Lora of Peña Ulaña.

Las Loras Geopark, in the north of Castilla and León (Spain), has an area of 950 km^2 and about 13,000 inhabitants.

The attention of visitors to the Geopark is immediately drawn to the powerful impact and natural beauty of its landscapes. Las Loras resemble enormous natural fortresses, more than 1,000 metres high, which define the extent of the Castilian Plain and lead us into an ancient territory which has been occupied since Palaeolithic times. Fertile valleys, deep canyons eroded by rivers, rock labyrinths, beech and oak forests and numerous crystalline waterfalls situated between high moorlands represent one of the most diverse environments and areas in Northern Spain.

The rocks in the Geopark tell stories about Jurassic seabeds where the only onshore oil deposits on the Iberian Peninsula were generated, about large rivers flowing through Iberia more than 100 million years ago, about amazing dinosaurs that lived in this region and about the significant development of reefs 90 million years ago. Together with the geological heritage, the territory is characterized by the extraordinary biodiversity in an environment which is ideal for watching birds or Iberian wolves and for observing over forty species of orchids representing more than a third of all the orchids described from the Iberian Peninsula.

Las Loras Geopark contains the largest concentration of Romanesque buildings in Europe. Monasteries, churches and villages, beautifully and exceptionally well preserved, which easily evoke life during medieval times. Other cultural jewels are represented by rock hermitages, the exceptional concentration of Megalithic monuments and pre-Roman forts scattered throughout the territory.

An aging population and depopulation, two major problems in the territory, are significant factors which make it difficult to start or maintain a business or to ensure the care and protection of the natural and cultural heritage. For this reason the Geopark will serve as a tool for stimulating the sustainable development of the region.

Map showing the location of Las Loras UNESCO Global Geopark.

The Geopark is led by the ARGEOL Association, together with an Executive Committee formed by representatives of municipalities, associations and foundations, rural development groups and provincial and regional administrations. These coordinate the Geopark's action plan and maximize the available resources. The structure of the organization also includes the participation of economic-social and educational-scientific councils together with contributions from voluntary groups.

More than ten years of investigation has resulted in the description and creation of an inventory of diverse sites of special interest. Developing the Geopark project involved numerous activities including the publication of informative material, developing geo-route equipment, organizing and delivering geo-days, informative talks, geo-volunteering, geo-weeks, activities with school children and universities, meetings with companies and associations, and participating in national forums, congresses, roundtables and other events.

The Geopark has three main lines of action within a programme for heritage conservation, management and comprehensive development. These are: the programme for educational dissemination and scientific research; the programme for sustainable social and economic development; a programme focused on generating employment and new opportunities for entrepreneurship by developing top-quality geotourism and ecotourism provision (geotourism) linked with the prestige of membership of the " UNESCO Global Geoparks".

The ruiniform karstic landscape of Las Tuercas and Horadada Canyon.

Karmah Salman and Jose A. Sánchez.
(geoloras@gmail.com)

Looking forward to seeing you at the GGN Conference!

ADAMELLO BRENTA GEOPARK
Madonna di Campiglio - Italy

8th INTERNATIONAL **CONFERENCE** ON **UNESCO** GLOBAL GEOPARKS

8-14 SEPTEMBER 2018

The Adamello Brenta UNESCO Global Geopark invites you to discover the uniqueness of its geodiversity: two mountain ranges facing each other with very different geological and geomorphological characteristics, glaciers, lakes, waterfalls, karstic springs, fossils, caves, magmatic, sedimentary and metamorphic rocks all in one place. A stunning territory with fir, beech and larch forests, flower-filled meadows and pastures inhabited by brown bears, chamois, deer, eagles, marmots and many other animals.

Meet the people living in these mountains, proudly following traditional activities and engaging in promoting sustainable social and economic development.

Come and visit the Adamello Brenta UNESCO Global Geopark and participate in the 8th International Conference on UNESCO Global Geoparks in September 2018 to find out the secrets of the Earth's history and live the Italian natural and cultural heritage!

WHERE

Madonna di Campiglio, Trentino, Italy.

WHEN and WHAT

8 – 10 September, 2018: pre-Conference Meetings (UGG, GGN, Regional Geoparks Network).
11–14 September, 2018: GGN Conference on "Geoparks and Sustainable Development".
11–14 September, 2018: Parallel programme for partners and families.
8–10/15–17 September, 2018: Pre/Post-Conference Tours in Italian Geoparks and cities.

PARCO NATURALE ADAMELLO BRENTA Geopark

United Nations Educational, Scientific and Cultural Organization · Adamello Brenta UNESCO Global Geopark

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FOR MORE INFORMATION: www.ggn2018.com

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MADONNA DI CAMPIGLIO PINZOLO VAL RENDENA TOP DOLOMITES

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