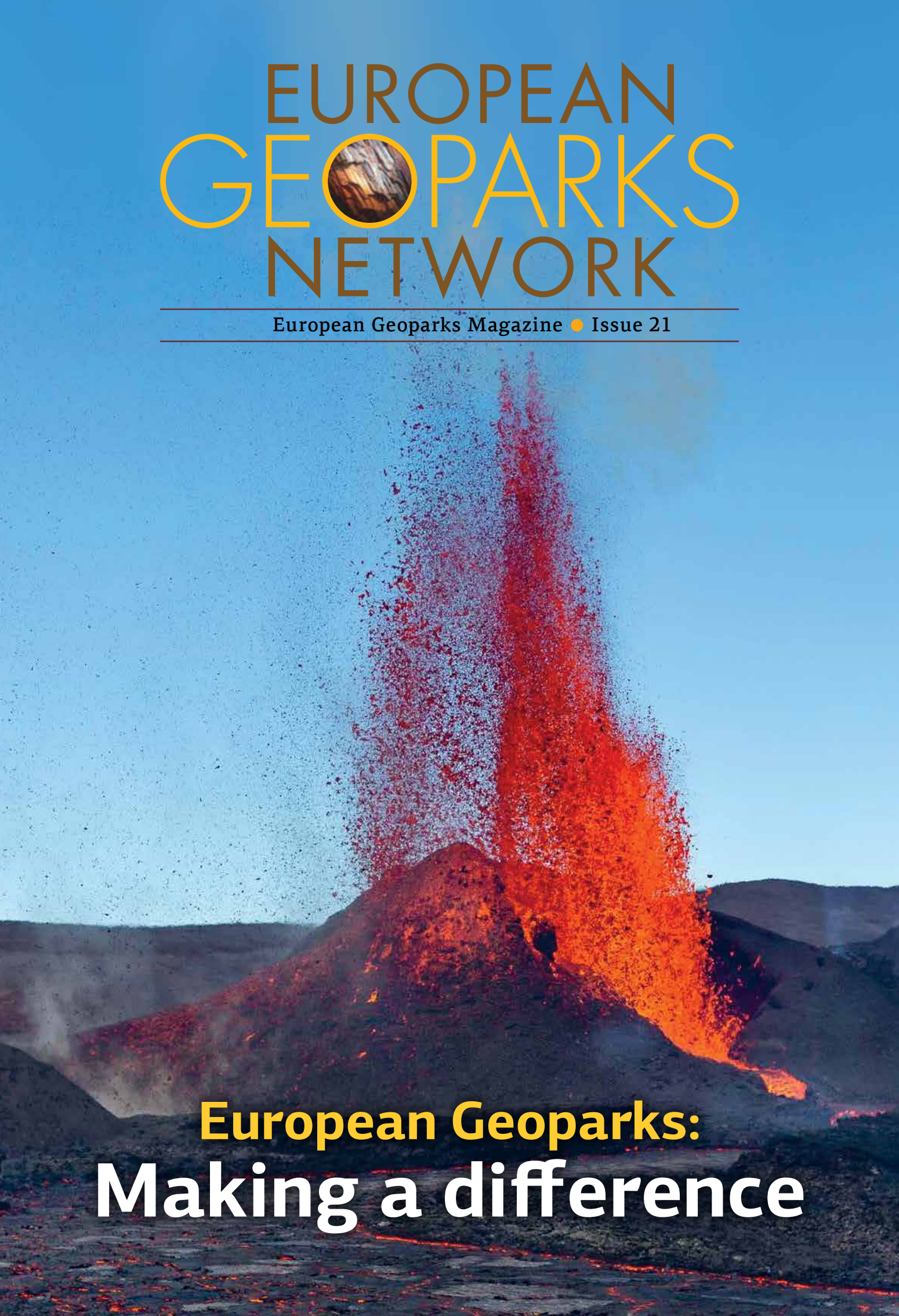


EUROPEAN GEOPARKS NETWORK

European Geoparks Magazine ● Issue 21



European Geoparks:
Making a difference

THE EUROPEAN GEOPARKS NETWORK

www.europeangeoparks.org

EGN Calendar

2024

- 5-9 March 2024:** 49th European Geoparks Network Coordination Committee Meeting, Kula - Salihli UNESCO Global Geopark, Turkey
- 22 March 2024:** World Water Day
- 22 April 2024:** International Mother Earth Day 2024
- 18 May 2024:** International Museum Day
- 18 May - 2 June 2024:** EGN Week
- 27 May - 3 June 2024:** International Course on UNESCO Global Geoparks “UNESCO Global Geoparks and Sustainable Management”, Lesvos Island UNESCO Global Geopark, Greece
- 5 June 2024:** World Environment Day
- 8 June 2024:** World Oceans Day
- 9 August 2024:** International Day of the World’s Indigenous Peoples
- 17 September 2024:** World Cleanup Day
- 18-19 September 2024:** 50th EGN CC meeting (online)
- 27 September 2024:** International Tourism Day
- 2-4 October 2024:** 17th European Geoparks Conference, Reykjanes UNESCO Global Geopark, Iceland
- 6 October 2024:** International Geodiversity Day
- 13 October 2024:** International Day for Disaster Risk Reduction
- 5 December 2024:** World Soil Day
- 11 December 2024:** International Mountain Day

2025

- 22-26 January 2025:** International Tourism Fair FITUR in Madrid
- 5-6 March 2025:** 51st European Geoparks Network Coordination Committee Meeting, Paris
- 22 March 2025:** World Water Day
- 22 April 2025:** International Mother Earth Day 2025
- 18 May 2025:** International Museum Day
- May - June 2025:** EGN Week
- 5 June 2025:** World Environment Day
- 8 June 2025:** World Oceans Day
- 20-29 June 2025:** International Course on UNESCO Global Geoparks “UNESCO Global Geoparks and Sustainable Development”, Lesvos Island UNESCO Global Geopark, Greece
- 8-12 September 2025:** 11th International Conference on UNESCO Global Geoparks, Kütralkura UNESCO Global Geopark, Chile



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Geoparks: “Making a difference”

The European Geoparks Network (EGN) is one of three regional networks designated as UNESCO Global Geoparks (UGGps)

The activities highlighted in the 21st Issue of the EGN Magazine show how the European Geoparks are “Making a Difference” in their territories. The physical EGN Coordination Committee Spring Meeting, hosted by Hateg County UGGp, Romania, in March 2023, was followed in September by the first EGN digital Coordination Committee Meeting. With the designation of four new Global Geoparks, EGN affiliation increased to 98 members in 28 countries.

In 2023 Idrija and Ore of the Alps UGGps marked their tenth anniversaries as members of the EGN. The Harz Braunschweiger Land UGGp celebrated the definition of the internationally significant reference point (a golden spike), within its territory, marking the boundary between the Cretaceous Turonian and Coniacian Stages.

Promoting geotourism contributes to sustainable economic development. Adamello Brenta highlights its programme for making mountain trails available to people with motor or visual impairments. Burren and Cliffs of Moher UGGp’s Geopark Code of Practice monitoring system will receive national recognition under the new All Ireland Sustainable Tourism Assurance Programme. Causses du Quercy UGGp promotes geotourism and palaeontology with sculptures of extinct animals sited along two cycle routes. Kula and Salihli UGGp affirms its role as a major force in tourism-related socioeconomic and cultural development. VIGEOCULT, a research project in Origenes UGGp, aims to produce the least impact on the territory, minimize the number of invasive infrastructures, and reduce maintenance costs. Saimaa UGGp highlights the importance of digital tourism services as a more sustainable operations model for the tourism industry. A regional beer with locally grown malting barley, contributes to sustainable development in Mellerdall UGGp . Troodos UGGp created the 4.7 km long “Pikrovrisi tis Merikas” nature trail and TERRAvita UGGp introduces its new nature and geopath “Secrets of the Big Mountain”.

Apuan Alps and Maestrazgo UGGps protect their geoheritage by limiting access to ornamental stones and promoting responsible geoclimbing respectively.

All UGGps engage in formal and informal education. The Municipal Museum in Arouca UGGp is a mediator for establishing a closer relationship with schools. Eisenwurzen, Idrija, Odsherred and Magma UGGPs investigate, with the Erasmus+ project «Young European GeoExplorer», what is needed for good geology and science teaching. Katla UGGp’s Geoschool’s “ten peak hikes” encourages student interest in healthy lifestyles, and the nature and geology of the area. Massif des Bauges’s educational tarpaulin can be used in the field or displayed on the walls of a museum. Lauhanvuori – Hämeenkanigas UGGp’s environmental education team take education outside the classroom. The «With Dirt to prosperity» exhibition focuses on the industrial history and geology

of the Muskauer Faltenbogen / Łuk Mużakowa UGGp. Riess UGGp’s Geopark Ries Schools promote regional identity and sustainable development to young people of all ages. The Geocentros (Geocentres) recovery of legends in Villuercas-Ibores-Jara UGGp involves collaboration between parents, grandparents and schoolchildren. The Vikos-Aoos UGGp showcased its regional geological heritage in the exhibition “The rocks of the Vikos-Aoos UNESCO Global Geopark Under the Microscope”.

UNESCO Global Geoparks engage with global climate change, the biodiversity crisis, and bioconservation. The South Devon University Centre, a core partner of the English Riviera UGGp, created the new Foundation Science Degree Global Change, Sustainability and Society. Beigua UGGp is involved with Wolf management, a topic regulated by European and national laws, to ensure their conservation. Chablais UGGp highlights extending stakeholders’ understanding of nature for the improved management of the region’s natural heritage. In Chelmos-Vouraikos UGGp informative sessions play an important role in environmental protection. Implementing protection measures at its geosites safeguards rare endemic plants in Lesvos Island UGGp. Participating in a working group and multiple feedback sessions developed guidelines for fire-smart landscape planning in Luberon UGGp. The microbiological heritage is a focus in the Maiella and Pollino UGGps. Psilotheris UGGp participated in the «Epimenides II- On the Nature of Things» with the theme “The Climate Crisis”. The Fellfoot Forward Landscape Partnership Scheme involved the conservation, enhancement and celebration of the natural and cultural heritage in the North Pennines AONB Geopark. Sitia UGGp is a part of the project «LIFE – AgrOasis: Regenerative approaches for implementing climate change resilience in EU agricultural regions prone to desertification” Beach cleaning and coastal protection are highlighted by Gea Norvegica, Trollfjell and Mourne Gullion Strangford UGGps.

UGGps are also a focus for scientific research. Famenne Ardenne UGGp describes the use of 3D LIDAR acquisition in a show cave. A prototype robot for autonomous mining was successfully tested within the framework of the Horizon2020 project ROBOMINERS in Karawanken / Karavanke UGGp.

The Ore of the Alps UGGps celebration of 12 years of partnership with its partners highlights the importance and success of networking.

In “Making a Difference” European Geoparks have strengthened the ways in which they engage with their communities, with visitors and with each other. Through their involvement with the environment, and in addressing the climate and biodiversity crises geoparks demonstrate that their bottom-up approach can make a significant difference both now and in the future.

Tony Ramsay,
Publication Editor

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Hațeg Country UNESCO Global Geopark, Romania The European Geoparks Network spring meeting 2023



Delegates participate in the discussion for developing a common operational strategy.

The European Geoparks Network Meeting, held in the city of Hațeg, Romania, brought together representatives from UNESCO-recognized geopark territories from 28 countries.

This was the first time that Romania hosted such a large UNESCO event in the country's and Eastern Europe's first UNESCO Global Geopark – the Hațeg Country Geopark.

Between March 27-30, Hațeg hosted meetings of the governing bodies of the European Geoparks: the Advisory Committee and the Coordination Committee. Participants at the meeting voted that the EGN spring meeting in 2024 was to be hosted by the Kula-Salihli Geopark in Turkey. Additionally, that in 2024 the European Geoparks Network Conference, which takes place every two years, will be held in the Reykjanes Geopark in Iceland. The event in Hațeg was also significant in making progress for developing a common operational strategy and defining the EGN's financial governance. The final part of the event included field visits. Participants chose from three routes: one followed in the footsteps of palaeontologist Franz Nopcsa and the dwarf dinosaurs, the



second focused on the legacy of volcanoes in Densuș and the Romans in Ulpia Traiana Sarmizegetusa, and the third introduced international guests to Hunedoara Castle and Deva Citadel, promoting the county's heritage.

What distinguishes the Hațeg Country Geopark within the EGN is its administration by the University of Bucharest. It is also the only European Geopark that creates a bridge between academia and the local community.

«The University invests money, time, and energy in the Geopark, which is far removed from Bucharest. Firstly because one of our missions is to develop communities, and to give back to society and local communities. Secondly, because we believe that education should happen not only in lecture halls and libraries but also in the field, where things are happening. That is why the University of Bucharest has supported and will continue to support such projects. We are also involved, together with our colleagues, in Romania's second UNESCO Global Geopark, the Buzău Land Geopark, and we will support future applications for other geoparks as well,» said Prof. Marian Preda, Rector of the University of Bucharest.



Delegates and Hațeg Country Geopark volunteers at the spring meeting 2023.

«As a team from the University of Bucharest, we have shown that the University is a partner of the local community. Everyone was involved in organising this event, from the County Council to the local municipalities, local partners, volunteers, and community members. In fact, the Geopark is about partnership, and now we had the opportunity to show our European Geoparks Network colleagues that we have this capacity, that Hațeg Country is a real geopark, a Geopark for the people. In essence,

the Geopark is like an open-air university,» said Dr. Alexandru Andrașanu, Director of the Hațeg Country UNESCO Global Geopark.

«Only in places like this, with the awareness that you're doing something useful for the community, coming from the side that has acquired more knowledge, can we truly achieve our goal – the growth of this wonderful region that has all the conditions to be at the forefront. In the case of geoparks, hierarchy does not matter, but it is crucial

to make the most of their potential,» said Prof. Dan Grigorescu, the first director of the Hațeg Country UNESCO Global Geopark.

Referring to the connection the Geopark makes between the local and academic communities, a new element of this EGN meeting was the organisation of an open session. Participants had the opportunity to meet Geopark partners, from local to university level, to learn about the projects taking place in Hațeg Country, and to explore new ways of collaboration through joint international projects.

«Interaction with local communities with universities, is a distinctive feature of the UNESCO Global Geopark concept. I believe Hațeg Country Geopark is an exceptional example in this regard. We see a very close cooperation with the host community, where people are making efforts to support the Geopark, and with the University of Bucharest. It is truly a unique relationship, and we hope it will inspire other geoparks,» said Kristof Vandenberghe, Head of the Earth Sciences and Geohazard Risk Reduction Section and Secretary of the UNESCO Geosciences and Geoparks Programme.

Participants at the 47th EGN meeting were very pleased to discover the Hațeg Country Geopark and a part of Romania. They also appreciated the team's collaborative efforts, the Geopark volunteers, and partners' contributions to organising the event.

«I would like to convey my warm thanks, and I believe I speak for all EGN members on the Coordination Committee who had the privilege of visiting your Geopark and experiencing the hospitality, warmth, and friendship extended by the people

here. Such gatherings add value to the EGN and help us move forward through volunteerism and synergy towards a better future for our communities and cooperation within the Network. The willingness of all participants to overcome obstacles and be present in this wonderful Geopark, to discuss, to meet face-to-face, and to shape our shared future is the strongest indicator that the dark times of COVID might be over, finding us stronger than before,» was the message from Dr. Charalampos Fassoulas, EGN Vice-Coordinator, following the Hațeg meeting.

The European Geoparks Network meeting was organised by the University of Bucharest in partnership with the Hunedoara County Council, the City Hall of Hațeg, and the Hațeg Country Inter-communal Association, with support from the Romanian National Commission for UNESCO. Event partners included Țara Hațegului Ecotourism Destination, SC Adaconi srl, Banca Transilvania, DIGI, Hoha Events, Hunedoara Castle, the Museum of Dacian and Roman Civilization in Deva, Dinosaurs World Transylvania, the Association of Women from Sântămăria – Orlea, Drag de Hațeg Association, «I.C. Brătianu» High School, LuciAna Local Gastronomic Point, Hațeg Village Museum, and Ritmuri Hațegane Folk Ensemble. Media partners included Radio Romania International, Radio Romania Cultural, Agerpres, Antena 3 Deva, Hunedoara 1 TV, Replica – Info HD TV, BIG FM, Accent Media, Hunedoara Liberă, Cronica Văii Jiului, and Ziarul Exclusiv.

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Kristof Vandenberghe, Head of the Earth Sciences and Geohazard Risk Reduction Section and Secretary of the UNESCO Geosciences and Geoparks Programme updates the delegates on recent developments in UNESCO.



The European Geo parks Week 2023



ADAMELLO BRENTA UGGP ITALY



BEIGUA UGGP ITALY



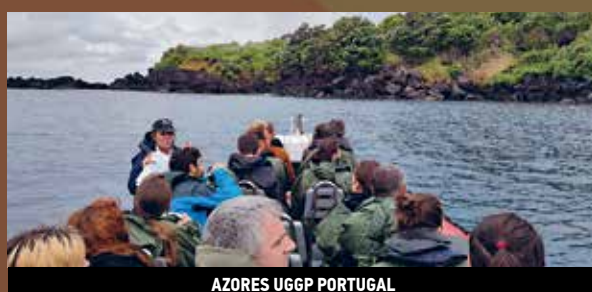
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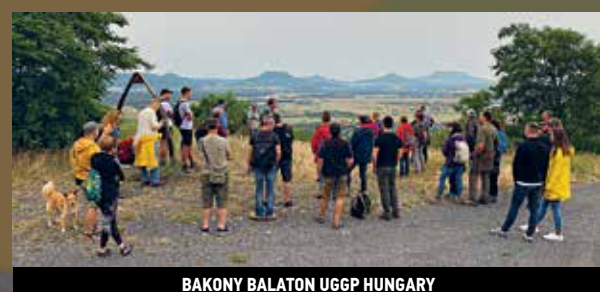
CHABLAIS UGGP FRANCE



COUREL MOUNTAINS UGGP SPAIN



AZORES UGGP PORTUGAL



BAKONY BALATON UGGP HUNGARY



CAUSSES DU QUERCY UGGP FRANCE



CUILCAGH LAKELANDS UGGP



BASQUE COAST UGGP SPAIN



BERGSTRASSE-ODENWALD UGGP GERMANY



COPPER COAST UGGP REPUBLIC OF IRELAND



CATALUNYA CENTRAL UGGP SPAIN



BOHEMIAN PARADISE UGGP CZECH REPUBLIC



BUZAU LAND UGGP ROMANIA

The European Geoparks Week, often called the Geoparks Festival, held between late May and early June, is a major item in the annual calendar of events for all European Geoparks. This European-wide festival aims to raise public awareness about Geoparks, their role in conserving the geological heritage, educational activities and how they endeavour to provide economic benefit for local people by promoting geotourism. It also shows geopark communities that they are part of a wider European Network and Global Network.

Events in the 2023 European Geoparks' programmes involved a variety of activities which, by highlighting the links between the geology, landscape, natural and, cultural heritage informs local communities and the wider public about the holistic

nature and aims of the Geopark concept.

During EGN Week 2023, 93 European Geoparks organized 1,060 activities attracting 209,750 visitors, and 77 activities with 92,696 participants. Nowadays on-line promotion of the Geoparks on the web and social media plays an increasingly important role. In addition, 560 press releases, 139,639 programme flyers and 391 printed articles were published.

Guided tours provided an opportunity to showcase landscapes and geology along established way-marked trails, introduced new trails and emphasised the need for environmental conservation. The Azores UGGp celebrated geoparks and their contribution to sustainable development with a boat trip around Terceira Island. Basque Coast UGGp held an interpreted guided tour of the Valley



FAMENNE-ARDENNE UGGP BELGIUM



ESTRELA UGGP PORTUGAL



DJERDAP UGGP SERBIA



ENGLISH RIVIERA UGGP ENGLAND



GREVENA-KOZANI UGGP GREECE



GRANADA UGGP SPAIN



GEOMÔN UGGP WALES



HARZ.BRAUNSCHWEIGER LAND . OSTFALEN UGGP GERMANY

of Prehistory. During the walk participants viewed replicas of archaeological and palaeontological artifacts, and illustrations of prehistoric life. Four speakers talked about a range of geology-related topics in Beaujolais UGGp's third floating conference. Participants made a «journey inside the Earth», to examine outcrops of rocks found in the Earth's mantle in Beigua UGGp. In Bohemian Paradise UGGp visitors experienced an all-day event at Trosky Castle consisting of two volcanic cones with the ruins of a castle on each of them. Geopark Assistant Development Officer Ben chauffeured a very enthusiastic group around Cuilcagh Mountain in the Cuilcagh Lakelands UGGp. In Famenne-Ardenne UGGp three guided walks focused on geology, biodiversity and architectural heritage. Fforest Fawr UGGp teamed up with the local rural arts organisation, 'Peak Cymru' to take a group of ar-

tistic curators on a 'timewalk' through the local landscape, fulfilling the Geopark's commitment to understanding the landscape through contrasting lenses. A visit to Llanddwyn Island, the most iconic site in GeoMôn UGGp, introduced participant to the famous Precambrian mélange and pillow lavas. Granada UGGp organized a guided visit to the Baza Fault, and a Geo-route to the Mirador del Jabalcón, one of the most spectacular viewpoints in the Geopark. A guided cycling tour introduced 20 cyclists to the new GeoBike mountain bike trail in Lauhanvuori - Hämeen kangas UGGp. In Lesvos Island UGGp participants visited the geosites in the centre of the Island during the the "Green Paths" hiking tour. In Luberon UGGp participants discovered the ancient agricultural practices and the geological history of sedimentary rocks along a centuries-old trail on the Claparèdes Plateau.



HAUTE PROVENCE UGGP FRANCE



HOLY CROSS MOUNTAINS UGGP POLAND



IDRIJA UGGP SLOVENIA



HATEG COUNTRY UGGP ROMANIA



KULA ZALIHILI UGGP TURKIYE



KATLA UGGP, ICELAND



LANZAROTE AND CHINIJO ISLANDS UGGP SPAIN



LAS LORAS UGGP-SPAIN

Massif des Bauges UGGp held its third geology and climbing day during Geoparks Week. Guided hikes and bike tours focused on the geological, natural, cultural and intangible heritage in Möllerdall UGGp. Walks led by the Geopark's new guides showcased the Site of Special Scientific Interest at Knockan Crag in the North West Highlands UGGp. Riess UGGp highlights Amerdingen quarry, a geotope characterized by the impact rock Suevite. Rokua UGGp opened a new geosite. Guided tours focusing on environmental interpretation were popular in Rocca di Cerere UGGp. Saimaa UGGp introduced its new "Näkkinie mi Nature Trail" with local schools as the principal target group. The opening of a newly marked nature trail was among the popular events

in Salpausselkä UGGp. Visitors enjoyed a tour of the caves in Sierra Morena de Sevilla UGGp. "Geocaching: hidden treasures" was enjoyed by participants in an innovative activity which had many participants in Sierras Subbéticas UGGp. Walks, book presentations, and music are established events in the "Festival, Places of Time" in the Tuscan Mining Park UGGp. The "Brenz Adventure Day" was the highlight in the Swabian Alb UGGp. In Terras de Cavaleiros UGGp the environmental march raised awareness of the importance of preserving the environment. Vulkaneifel UGGp organized a tour of the Obereher Heide "Nature Reserve" with biotope supervisor Dipl. Ing agr Gerd Ostermann. Engaging with children, students and visitors are



LESVOS ISLAND UGGP GREECE



LAUHANVUORI -HAMEENKANGAS UGGP FINLAND



ROKUA UGGP FINLAND



MADONIE UGGP ITALY



MAIELLA UGGP ITALY



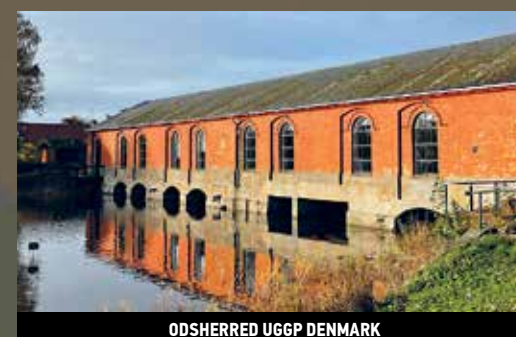
NATURTEJO UGGP PORTUGAL

regular educational activities during EGN Week. Bakony-Balaton UGGp launched the innovative "Geopark Outdoor Open University" where "geo-fans" can meet natural and social scientists at one of the Geopark's iconic geosites. The Geopark Academy provided a full day of multi-disciplinary presentations on recent research from national institutions and universities in the Burren and Cliffs of Moher UGGp. The temporary exhibition about the geodiversity of the Geopark was the most successful event in Catalunya Central UGGp. Geodiversity and biodiversity were highlighted in nine nature events in Chablais UGGp. Courel Mountains UGGp used a webinar to promote «caves and karst: a journey through the Spanish geoparks». Teachers and children, with the cooperation of the preschool institution, «Ecology Festival», participated in a play about ecology in Djerdap UGGp. Fifteen teachers participated in the seminar «Introduction to Volcanology» in El Hierro UGGp. In Grevena-Kozani UGGp, students at the 6th Kindergarten of Grevena

learned how soils support life on Earth. Schoolchildren learned about the background of drinking water and wastewater supply in a hands-on project in Harz. Braunschweiger Land. Ostfalen UGGp. The book "The last dinosaurs", describing the dwarf and giant dinosaurs that inhabited Hateg Country Park UGGp, was launched during EGN Week. Holy Cross Mountains UGGp focused on geological/ecological education and network cooperation with the Madonie and Kula geoparks as part of the international project «Geoeducation for everyone». Numerous workshops and fieldtrips focused on the annual Geopark topic in the school year 2022/2023, i. e. "FOREIGN SPECIES - enemies or friends" in Karawanken/Karavanke UGGp. Katla UGGp held a daily vote on Facebook on which rock type should become the rock type for Katla Geopark. Madonie UGGp's project "Let's colour our future": Naturalistic excursions «Monumental Trees» and «Royal Eagle» paths included a guided tour of the historic centre of Petralia Soprana. Eighteen students from



MOURNE GULLION STRANGFORD UGGP UK



ODSHERRED UGGP DENMARK



KARAWANKEN - KARAWANKE UGGP AUSTRIA - SLOVENIA



CABO DE GATA NIJAR UGGP SPAIN

the Rural Grouped Schools and the CEIP Virgen de la Hoz of the Molina-Alto Tajo UGGp focused on important concepts in the natural and geological environment in the landscapes of río Gallo Gorge geosite. In Kula-Salihli UGGp the students of The Jeopark (Geopark) Secondary School were provided with training about the Geopark and the importance of nature conservation. The twelfth edition of «What is a Geopark for you?» reaches out to schoolchildren in Maestrazgo UGGp. In Maiella UGGp special attention was given to children from 6 to 13 years



ORE OF THE ALPS UGGP AUSTRIA



ORIGENS UGGP SPAIN



EL HIERRO UGGP SPAIN

old, who were involved in educational workshops on the geology of the Geopark. Staff from the North Pennines AONB UGGp visited two local primary schools to watch videos made by children in UNESCO Global Geoparks across Europe. Visitors using virtual reality goggles, had virtual experiences of dinosaurs in two museums in Origenes UGGp. Papuk UGGp prepared three new workshops for primary and secondary school students. In Sitia UGGp the "World Environment Day" was celebrated with teachers and pupils from elementary schools in the



MASSIF DES BAUGES UGGP FRANCE



NOVOHRAD-NOGRAD UGGP HUNGARY



PAPUK UGGP CROATIA



PLATÅBERGENS UGGP SWEDEN



PSILORITIS UGGP GREECE



TERRAVITA UGGP GERMANY



OUTLOOK-EIN BILD MELLERDAL UGGP LUXENBURG

Geopark. Thirty students, between the ages of 12 to 15, from Leka School focused on teamwork and practical outdoor knowledge in Trollfjell UGGP. The interactive photographic exhibition with the title: "The Rocks of the VIKOS-AOOS UNESCO Global Geopark under the microscope" introduced participants to the spectacular world of rocks through the eyes of a geologist and the microscope.

European Geoparks Week provides an opportunity for a variety of activities associated with the artistic culinary and cultural aspects of geoparks. The Apuan Alps UGGP organized the traditional event of wild food foraging ("Andà per erbi bóni") at Bosa Geopark Farm. The "Wine Hiking Day" was a popular event in Bergstrasse-Odenwald UGGP. Vis-

itors were treated to a "Food and Experience Walk" on Mt Kinnekulle in Platåbergens UGGP. In TERRA. vita UGGP participants from 17 different nations provided culinary delicacies from their homeland. Aspromante UGGP held the 45th national assembly « Places, cultural heritages, communities of values for sustainable development ». "Rock Resonances", an artistic and scientific adventure which plunges us into the space of the painted caves is an exciting activity in Causses du Quercy UGGP. In the De Hondsrug UGGP, visitors were able to meet prehistoric people in person in the settlements of the prehistoric park of the Hunebedcentrum. The Kents Cavern coastal foraging workshop and cave tour revealed how ancient occupants of the cave



SIERRA SUBBETICAS UGGP SPAIN



TERRAS DE CAVALEROS UGGP PORTUGAL



SITIA UGGP GREECE



SOBRARBE-PIRENEOS SPAIN



SALPAUSSELKÄ UGGP FINLAND



STYRIAN EISENWURZEN UGGP AUSTRIA



THURINGIA_INSELBERG-DREI_GLEICHEN UGGP GERMANY



SIERRA MORENA DE SEVILLA UGGP SPAIN

would have foraged for foods still available today in the English Riviera UGGP. In Lavreotiki UGGP, "Once upon a time, there was a worker" during which nursery and primary school students followed the daily life of a miner in the French mining company in Lavrion was one of the most successful events. Visitors were given the opportunity to understand the intimate links between geological resources and cultural heritage in an outdoor exhibition in Haute-Provence UGGP. In Novohrad-Nógrád UGGP several stakeholders participated in events in the Bükk National Park Directorate, Hollokö WHS or the Holly Well Pilgrimage Centre. Odsherred UGGP

celebrated the 150th anniversary for the reclamation of the the ford system in the Lammefjord area. Psiloritis UGGP shared an evening of joint activities with its partner, the Palaeontological Museum of Rethymnon (one of the main cities near the territory's borders). The workshop "The field notebook of Eduardo Martínez de Pisón" was one of the most celebrated activities ever organized by the Sobrarbe-Pirineos UGGP in which the highly respected emeritus professor gave an inspiring demonstration of the cultural appreciation of the mountains. «Poetry in feminine», a recital of verses by great women poets, celebrated International



TROODOS UGGP CYPRUS



TUSCAN MINING PARK UGGP ITALY



VILLUERCAS_IBORES_JARA UGGP



VIS ARCHIPELAGO UGGP



VIKOS-AODS UGGP GREECE



VULCANEIFEL UGGP



SWABIAN ALB UGGP GERMANY

Book Day in Villuercas-Ibores-Jara UGGp. A six day photographic workshop combined art and geological heritage in the Vis Archipelago UGGp.

Activities during EGN Week 2023 also focused on climate change and risk assessment. Adamello Brenta UGGp held the second meeting of the Glacier Days Cycle, promoted by the steering committee for protected areas and glaciers. EGN Week events in Buzău Land UGGp focused on raising awareness about the Geopark's geohazards and

mitigation strategies. "The lies of climate change" showing how the media disseminates untruthful news about climate change was the most successful activity in Cabo de Gata – Níjar UGGp. Copper Coast UGGp's "Kilfarrasy Erosion Workshop" about climate change and its impact on a local beach was featured as a podcast on a local radio station. Organizing "A weekend without a car in Upper Idrija Landscape Park" encouraged visitor access by sustainable transport in a free public bus in Idrija



MAESTRAZGO UGGP SPAIN



ASPRONTE UGGP ITALY



BEAUJOLAIS-UGGP FRANCE



MOLINA-ALTO TAJO GEOPARK UGGP SPAIN

UGGp. Styrian Eisenwurzen UGGp's temporary exhibition in the village of Weissenbach introduced 6 to 14 year old children to climate change and to the challenges we are facing.

EGN Week 2023 also provided an opportunity for group activities and for promoting geoparks and the geopark concept. All the Portuguese geoparks met in Estrela UGGp to share their experiences and to showcase the everyday work of their territories among their communities. In Ore of the Alps UGGp the highlight of EGN Week 2023 involved combining ten years of cooperating between the German Geoparks Porphyryland and Thüringen Inselsberg-Drei Gleichen UGGp and the Austrian Geopark Fora with celebrating the Geopark's 10th anniversary. The UNESCO World Heritage Market in Weimar on 3 and 4 June provided Thüringen Inselsberg-Drei Gleichen UGGp with the opportunity to present itself together with thirteen other German UNESCO World Heritage Sites.

Geoparks also access the media to promote their territories and introduce viewers and listeners to the role of geoparks. Naturtejo UGGp's Landscape Festival was presented on national public television. Carlos Neto de Carvalho was invited to pres-

ent the European Geoparks Week programme live from the studios in Castelo Branco, in the heart of the Geopark.

Geoparks offer an opportunity for promoting health and well being. Lanzarote and Chinijo Islands UGGp highlight their cooperation with «El cribo», a mental health association, from which a group of people participated in the screen printing workshop with «cochineal», an insect from which natural dye is extracted.

Engaging with young people is a significant developing movement within European Geoparks. Las Loras UGGp showcases the "Geoparqueando" activities and the first meeting of the Geopark's Youth Forum. "Geoparqueando" is a field trip that was initiated in all Spanish Geoparks in EGN Week 2022.

The range and response to the activities delivered during EGN Week 2023 is testimony to the success and inventiveness of geoparks in engaging with visitors and the local communities. We look forward to building on these achievements in EGN Week 2024.

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Orígens UNESCO Global Geopark, Spain Virtual Reality Experiences to make a difference, the VIGEOCULT Project Example

VIGEOCULT is a multidisciplinary research project that aims to create a unique open natural museum within the Orígens UNESCO Global Geopark (UGGp) territory. By taking advantage of the rich local geological, palaeontological, and cultural heritage, the main goal of the project is to develop high-quality virtual and augmented reality experiences that allow visitors to understand how our planet and its inhabitants have evolved and changed over time. All audio-visual materials are produced with the highest scientific rigor and the most advanced technological support, resulting in outstanding immersive experiences that will attract visitors, experts or not, interested in understanding Earth's evolution and its preservation. Beyond being visually spectacular, the elaborated contents have indisputable educational values with a clear dissemination purpose.

From the Pyrenees formation to the last Ice Age, from the time of Pangea to the last days of dinosaurs, visitors will be able to acquire the basic concepts to understand the processes that have shaped the landscape and life on Earth, but particularly those present within the Orígens UGGp territory. It is expected that the virtual experiences illustrating climate change events and mass extinctions from the past will impact the public and will help to promote a sustainability consciousness to the Geopark visitors. Furthermore, the reconstruction of the possible future scenarios we are facing with the present climate trends will make us aware of their potential impact and the need for a global attitude to mitigate climate change and adapt our lifestyle to the new conditions.

In terms of implementation, the distribution of digital experiences throughout the Geopark has been planned to produce the least impact on the territory, minimize the number of invasive infrastructures, and reduce maintenance costs. In this sense, structural elements will only be installed when safety or preservation reasons make it compulsory, always using durable materials and looking for low environmental impact. In addition, VIGEOCULT considers the use of high-end information technology in the management of VR experiences, which will allow visitors to plan their trips more effectively and prevent unnecessary car journeys. In this way, the CO2 footprint will be reduced making the visits to the Orígens UGGp more sustainable.

The aforementioned ideas lead us to conclude that the use of virtual and augmented reality tools is a fundamental and promising resource to contribute to



3D model of the Orígens UGGp geological heritage 80,000 years ago rendered and textured by high-end software tools.

developing our world in a more sustainable way, minimizing environmental impact, raising awareness about the importance of taking care of the natural heritage and make geoparks go greener.

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Low impact infrastructure designed to allow virtual and augmented reality experiences for understanding the formation of the Abella anticline, an internationally recognized geological feature in the Orígens UGGp.



Low impact infrastructure designed to allow virtual and augmented reality experiences for understanding the formation of the Abella anticline, an internationally recognized geological feature in the Orígens UGGp.



Adamello Brenta UNESCO Global Geopark, Italy Adamello Brenta UNESCO Global Geopark: A protected area accessible to everyone



Trail accessible to everyone Patascoss - Lago Nambino.

Promoting the "Boundless Park Project".



One of the challenges that the Adamello Brenta UGGp has faced in recent years has been to become as inclusive as possible, accessible to everyone, including visitors who might find it difficult to walk along a mountain trail or to reach a high-altitude refuge. This includes people with motor disabilities or visual impairments, as well as families with small children in strollers, for whom reaching even relatively «easy» areas could prove to be a very complex task.

Certainly, for a high-mountain protected area, which covers 625 square kilometres and includes some of the most important peaks and glaciers in the entire Alpine region, it is unthinkable to make every destination easily accessible. The effort that was made was therefore twofold. Firstly, it involved removing barriers and simultaneously equipping a series of particularly significant trails to make them accessible to the widest possible number of people, without significantly altering their natural appearance. For example, from the path leading from Patascoss to Lake Nambino, made accessible even to wheelchairs, to the Nudole trail in Val Daone, where it is possible to have unique sensory experiences involving senses other than sight, such as touch or hearing.

All of this was achieved through continuous dialogue with other territorial partners, such as the Park's Municipalities, local tourist boards, the Autonomous Province of Trento, associations dealing with disabilities (Anffas, Prodigio), Family Districts, and others. In total, about ten paths were created to make the experience of visiting the Geopark truly fulfilling for everyone.

Recently, the protected area has also explored a second way to access its extraordinary natural heritage, based on virtual reality. Together with a specialized company, Medialab, a system was developed using next-generation visors, that allow wearers to «transport» themselves



Testing the virtual visors.

to 32 different locations within the protected area, by a waterfall, along a stream, in the middle of a forest, or in a high-altitude refuge. The application is becoming very popular, for instance, in retirement homes, enabling users who cannot move physically to experience paths, where boulders and other natural obstacles have been removed, and safety enhanced with the addition of guardrails and fences. The «immersive» experience in the Geopark's landscapes is accompanied by a voice guide that, in a simple manner (even to overcome potential cognitive limitations), allows for a closer understanding of the Park's various environments.

The Adamello Brenta UGGp is therefore truly a park for everyone. For the mountaineer or experienced hiker, but also for those who, despite limitations or disabilities, should be enabled to enjoy the beauty of nature and the beneficial effects it can generate in anyone.

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Apuan Alps UNESCO Global Geopark, Italy

The way to “limited” and “precious” marble. A Sustainable prospective for quarrying in the Apuan Alps Geopark

Fragment of ceiling lacunar in Carrara Marble from Luni (1st century BC – 5th century AD). La Spezia, Museo civico archaeological museum «Ubaldo Formentini».



Tomb of Michelangelo Buonarroti with sarcophagus in “Mischio di Seravezza” marble (Giorgio Vasari, Santa Croce Basilica, Florence).

In the framework of the social and economic challenges to be addressed in the territory of the Apuan Alps Geopark in Italy, the issue linked to the quarrying activities of its world-renowned ornamental rocks, including marble, is crucial.

Over approximately twenty-seven centuries of quarrying, the Apuan marbles have always been famous and appreciated for their aesthetic value. However, the current economic phase is characterized by the progressive decrease in the complete processing of marble on site and, in parallel, by the increasing exploitation of quarries to support the export of marble as a raw material.

The Apuan Alps Geopark authority has identified, as the only way to reverse this trend, is by subjecting the extraction of marble to a contingency plan in order to favour its use in high-profile and high-value creations such as those that are now significant monuments in art history. For this reason, the Geopark has started to develop a proposal aiming to limit access to the natural resources in order to preserve them and increase their value in terms of price/profit, by seeking

greater quality in handcrafted marble manufacturing. Consequently the future enhancement of the marbles moves towards becoming “limited” and “precious”.

Such a complex and sensitive issue cannot be separated from careful scientific research aimed at emphasizing the historical and cultural identity of the Apuan ornamental stones. As a first outcome, an inventory has been developed containing descriptive cards for 36 varieties of ornamental stones from the Apuan Alps of historical-cultural value and therefore worthy of conservation and/or sustainable use.

The main varieties of ornamental stones, including 36 marbles, were identified based on three selective requirements: ancient use, clear recognition and limited availability.

The inventory card consists of six text fields with information for each marble from the Apuan Alps: taxonomy, other denominations, geological unit and age, lithological and petrographic description, starting age for quarrying, typical quarrying localities.

Intense bibliographic research, beginning with the manuscript “Istoria delle pietre” by Agostino del Riccio dated ca. 1597, combined with an in-depth knowledge of geology, made it possible to highlight the historical-territorial evolution of Apuan marbles. It also distinguishes the main commercial varieties that have a specific geological origin, from the countless commercial names created mainly to boost their distinctive characteristics within the ornamental stone market.

The inventory emphasizes the historical and cultural identity of the Apuan marbles with the necessary scientific background to develop awareness that the promotion of marbles starts with the appreciation of the artistic value for which they were chosen in the past and for which they should be used in the present, following the route of the “limited” and “precious”.

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Arouca UNESCO Global Geopark, Portugal

Arouca Municipal Museum: The best starting point for discovering the Arouca Geopark



Arouca Municipal Museum building.

In the heart of the Arouca UNESCO Global Geopark (Portugal), the Municipal Museum is the best starting point for discovering the territory. From its four thematic centres – ‘The Territory’, ‘The Human beings’, ‘Living in the Mountains’ and ‘Living in the Valley’, it is possible to travel back millions of years, discover several traces of the human presence in Arouca and understand how the mountains and valleys shaped the way of life of its inhabitants.

The wealth of artifacts combined with numerous sound experience memories, make the permanent exhibition an excellent foundation for visitors to learn about the history and identity of the territory.

‘Birthing stones’ and giant trilobites can be admired in the museum and serve as an invitation to discover more of the territory’s geological richness in situ.

The ‘flint arrowheads’ (6th-5rd millennium BP) found in ‘mamoa’ 1 of Portela da Anta, the ‘ceramics with rosettes’ (4th century) found in the Castro de S. João de Valinhas and the ‘cossoiros’ (9th – 12th century) found in the Arouca Castle, allow us to understand the evolution of the human presence in this territory.

Permanent exhibition: “The Human” and “Living in the Mountains” thematic centres.



The ‘touço’ used to make butter and the coats made from wool and ‘burel’ attest to the self-sufficiency of the mountain communities. The countless agricultural tools artifacts transport us to the prolific valleys where agricultural practices predominated.

Testimonies of past practices and wisdom, such as prayers and remedies to solve health problems, can also be found.

With the aim of establishing a closer relationship with schools and local communities, the Municipal Museum often acts as a mediator. Within the scope of its educational function, the museum recognizes heritage – material and immaterial – as a privileged resource. A good example of this are the projects ‘One Object, One Story’ and ‘Botar Cantas na Escola’.

‘One object, One Story’ is dedicated to kindergarten students and takes place once a month in the museum. In each session, there is an object serving as a centerpiece for initiating a conversation, and the group explores its functionality and related stories. At an age of great curiosity, and in an engaging way, students discover the ways of living of the generations that preceded them.

On the other hand, ‘Botar Cantas na Escola’ is dedicated to the valorization of polyphonic popular singing and promotes the presence of local communities in primary schools. Groups of women, who are guardians of this heritage, visit the schools once a week to sing together with the students.

The polyphonic popular singing, known in Arouca as ‘cantas’, is disappearing due to the fact that its traditional spontaneous verbal transmission is no longer possible. With this project, the school becomes a new context for the verbal transmission of a heritage that has the ambition to be classified as Intangible Cultural Heritage.

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Community concert with the participation of the “Botar Cantas na Escola” project.



Basque Coast, Las Loras and Villuercas-Ibores Jara UNESCO Global Geoparks, Spain

Sharing and learning together: Familiarization trip with companies and town councils from three Spanish Geoparks



Group photo in Pico villuercas.



Group photo with the students and teachers in Canamero school.

Last November, delegations from Villuercas-Ibores-Jara, Las Loras and Basque Coast geoparks held a three-day meeting in the town of Guadalupe, (Spain). A large group of people representing town councils, collaborating organisations, tourism technicians and LEADER Groups accompanied by the directors of the Castilian Leonese and Basque Geoparks travelled to Villuercas-Ibores-Jara for a work meeting. The objectives of the meeting were, on the one hand, to learn in situ about the reality of the Extremadura Geopark and at the same time to promote a climate for exchanging experiences between the different participants.

Managers of Villuercas-Ibores-Jara Geopark and a varied representation of local and provincial authorities welcomed the group officially at the Guadalupe's House of Culture. During the three days of this exchange, participants had the opportunity to learn about various aspects concerning the Villuercas-Ibores-Jara governance and internal management. The participation in the local development strategy or different actions and projects developed in the territory were also some of the topics addressed during this visit.

In addition, representatives of the Basque Coast and Las Loras partner companies were able to learn from the president of the Geovilluercas Companies Association, an association member of the Villuercas-Ibores-Jara Executive Board, the magnificent work carried out by this organisation and the different activities that they

carry out throughout the year, together with the Geopark. The agenda included visits to Pico Villuercas, at 1,595 metres, the highest point in the Geopark; the Costanaza mine and its interpretation centre in Logrosán; a Primary School (as part of the Geocentre educational project) and the Visitor Reception Centre in the locality of Cañamero, as well as the Cabañas Castle.

We understand that carrying out this kind of exchange activities, where different actors (businesspersons, mayors, councilors, and technicians) from different geoparks interact, contributes to the learning and exchange of knowledge. They also contribute to the promotion of collaboration and cooperation among the Geopark's partners, as public and private organisations, developing an effective expansion of the transversal network so that the geoparks networks (national fora, EGN, GGN) are able to produce a new inspirational networking procedure, extending beyond their official representatives and reaching their local partners. In addition, it provides a huge injection of extra motivation for all of us who participate in these meetings. For that, we are sure that we will repeat this experience.

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Welcome session.



Parco del Beigua UNESCO Global Geopark, Italy

Men and wolves: Respect is the key to coexistence



Grazing goats.



A positioned wildlife camera.

A wolf explores its territory in a snow covered landscape.



Wolf management is a topic regulated by European and national laws to ensure their conservation. For some time now, this predator has returned to our mountains, migrating from central and southern Italy and occupying territories that had become unaccustomed to their presence.

From an ecological point of view it is a positive result, but creates issues of coexistence with livestock farms, which at first were not prepared to protect their animals from the predator's attacks.

The project promoted by the Beigua UNESCO Global Geopark was initiated by the urgency to improve knowledge about the presence of the wolf in our territory. We positioned 31 wildlife cameras, operating 24/7, throughout the Geopark area. The huge amount of data helped us to count the packs and their distribution.

At the same time, we analysed how local people,

including residents, tourists or livestock breeders, perceive the presence of the wolf in their territory. With the latter, the Geopark has established a long and rewarding collaboration, educating them on how to prevent predation. The Geopark provided breeders with electrified fences and instructions for their correct use, effectively zeroing predation.

This positive management model has become the focal point of the information campaign and the dissemination activities, in order to favour coexistence. The pastures are safe but at the same time we protect the wolf's fundamental role as a regulator of ecosystems. Once coexistence is established, we could think of developing the wolf as a touristic asset.

The Beigua Geopark addressed dissemination also to the population and tourists. By their nature, wolves are elusive and avoid contact with humans, but a more consistent presence or confidence on their part can increase the chances of an encounter. Therefore, it is essential to educate people to respect wildlife and its habitat: no food should be left available, pets should not be left to run free and no attempt should be made to approach the wolf. It could be necessary to adopt strict regulations to avoid interactions and possible consequences.

The project took into consideration the role of the media, which is responsible for spreading unverified news or sensationalistic headlines that feed arguments between those in favour or against the presence of the wolf.

The Geopark contributed to tourist-dedicated newsletters explaining the wolf's biology, its habits and how to behave in case of an encounter. Also, a video and a digital guide were produced, providing biological and ethological knowledge of the species and its prey, as well as demonstrative monitoring activities and information on how to use prevention systems.

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Burren and Cliffs of Moher UNESCO Global Geopark, Ireland

Making a difference: The Geopark's influence on the development of Sustainable Tourism in the region



Tourism
Businesses
within the
BCOM UGGP
and Clare
County Council
officials
and public
representatives
at the Geopark
Code of Practice
Awards Event
2022.

The Burren and Cliffs of Moher UNESCO Global Geopark has long been a leader in promoting sustainable tourism for businesses with its innovative Geopark Code of Practice monitoring system. This Code supports many of UNESCO's 17 Sustainable Development Goals, in particular SDG 3 (Good health and wellbeing), SDG 12 (Responsible consumption and production), SDG 13 (Climate action), SDG 14 (Life below water) and SDG 15 (Life on land).

Over 110 tourism businesses, from large visitor centres and hotels to small food businesses and single person activity guides, have engaged with our Code of Practice. It monitors and measures:

- consumption,
- CO2 emissions,
- contributions to local communities,
- purchases of local goods and services,
- knowledge of natural and cultural heritage,
- support for conservation,
- networking and collaboration,
- engagement with Leave no Trace.

The Geopark Code is about to receive national recognition as a credible sustainable tourism programme under the new All Ireland Sustainable Tourism Assur-

ance Programme endorsed by the national tourism organisations of Ireland and Northern Ireland.

The effect and impact of the Geopark Code has been the key influencer in the decision of Clare County Council, our managing authority, to seek Global Sustainable Tourism Council (GSTC) Destination Certification for the entire county of Clare. We will be the first County in Ireland to achieve this global standard, accredited by EarthCheck. This ambition has led to the creation of a county wide Green Team of agency, business and community representatives working together on measuring, monitoring, and managing the environmental, social, and economic impacts of tourism.

We have partnered with the Atlantic Sustainable Tourism Observatory, a member of the UNWTO International Network of Sustainable Tourism Observatories (INSTO). This partnership brings international experience and guidance from other destinations undertaking this complex and challenging journey. Our own journey in Clare will increase collaboration, awareness, and implementation of sustainable standards across many sectors and will support our county wide Tourism Strategy, Rural Development Strategy, Climate Action Plan, Biodiversity and Heritage Plans, County Development Plan and our national Sustainable Development Goal Champions Programme 2023-2024.

Part of this programme is to extend the Geopark Code of Practice for Sustainable Tourism Businesses countywide. In the coming weeks, months, and years we will be bringing our Geopark's sustainable tourism practice to a wider audience beyond the boundary of the Geopark, and we have directly influenced a significant change in approach to the management and promotion of tourism within the wider area of County Clare managed by the regional Local Authority, Clare County Council.

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Cabo Ortegal UNESCO Global Geopark, Spain

A journey to the Interior of The Earth



Herbeira Cliffs.

With a total area of 799 km², the UGGP Cabo Ortegal with its different geological formations forms part of one of the most complete allochthonous terrains of the Variscan Orogeny in Europe. This territory includes a total land area with seven municipalities: Cariño, Cedeira, Cerdido, Moeche, Ortigueira, San Sadurniño and Valdoviño (631 km²) as well as a sea section of the influence area, including natural protected spaces (168,72 km²) in the northwest of Spain.

The geological significance of this area is based on the presence of rocks that millions of years ago were in the Earth's upper mantle, at a depth of more than 70 km. Throughout the territory there is a rich cultural and architectural heritage from the Middle Ages onwards, including castles, monasteries, churches, and tombs. Here are also examples of the use of resources linked to the land and the sea: water and wind mills, ports, farmhouses, etc. The culture of the whole area is also expressed through its own gastronomy related to local products of the highest quality, fish, seafood, meat, vegetables, dairy products, honey, and more. Complementing this heritage is a wide range of events and festivals that connect directly with traditional practices or new initiatives: the International Festival of the Celtic World of Ortigueira, the Festival Irmandiño

Festival of the
Celtic World in
Ortigueira.



and the rural fairs in Moeche and San Sadurniño, the maritime processions of the seafaring towns Cariño, Cedeira and Ortigueira-, the recovery of the Samaín festivity in Cedeira and the "mallas" (cereal threshing) in Cerdido, the International surfing event at the Pantín Classic of Valdoviño. This is a place where the living culture is enthusiastically celebrated by the community and enjoyed by everyone.

The project management organisation is the "Asociación para a Xestión do Xeoparque do Cabo Ortegal", a non-profit association in which these seven municipalities are integrated.

The Executive Committee of the Geopark consists of the mayors and mayoresses of the promoting town councils, and the representative positions of the organisation rotate on an annual basis. On the other hand, the Geopark's management body currently has two technical experts to promote the project, a scientific director, and a local economic development professional in charge of the technical and administrative coordination of the project. In addition, there are technical staff and elected officials from the promoting town councils and the Provincial

Council of A Coruña, a body with which the town councils have also established an Inter-municipal Commission for the promotion and coordination of the project.

The UGGP Cabo Ortegal has a series of geological, environmental and cultural values that make it a truly unique territory. At present, there is no Geopark in Spain with sites of geological interest of international relevance in this context. The declaration of Cabo Ortegal Geopark, due to its uniqueness and recognition at national and international level, is a significant boost to the Spanish Geoparks Network for the conservation and enhancement of geological heritage, as well as promoting the sustainable development of this rural environment.

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Loiba Coast.



Causses du Quercy UNESCO Global Geopark, France

My village, my fossil



The Vaylatsia sculpture in the village of Vaylats

The Causses of Quercy UGGp is rich in geological curiosities. With its outstanding palaeontological heritage, the phosphate caves of Quercy, also known as Phosphatières, are the crown jewel of the Geopark.

The phosphatières are ancient caves carved into the limestone plateau, between 50 and 20 million years ago. These open chasms acted as veritable traps for animals. Filled with phosphate-rich clays, the phosphatières were quickly filled in, within a few tens of thousands of years at most.

Discovered at the end of the 19th century, the phosphate caves were excavated in the 1870s. The miners extracted not only phosphate but also fossils! Phosphate mining stopped at the beginning of the 20th century, but scientific research continued. Today, the phosphate caves of the Quercy region are regularly excavated by palaeontologists in search of the fossils they contain. More than 700 fossil species have been identified, ranging from rhinoceroses and tiny wasps to primates and giant snakes: the 300 phosphatières in Quercy have recorded 30 million years of life history!

In order to promote its fossils and inform local residents and tourists of the existence of these now extinct animals, the Geopark, in partnership with the Lot Nation-

al Geological Reserve, has created sculptures representing them. The animals chosen are those named after the commune in which they were discovered. For example, *Bachitherium* is a 30-million-year-old herbivore named after the town of Bach. The same goes for *Vaylatsia*, a species of bat discovered in a phosphate cave in the commune of Vaylats. In all, seven metal sculptures were created and installed in the villages. They were made by Patrick Médéric, a sculptor based in the Geopark.

To discover these sculptures, there are two cycling routes: an easy 18km route that will take you to four of the sculptures, and a 40km sportive route to discover all seven sculptures.

This €80,000 project has received a European LEADER grant.

Two other sculptures are planned.

Easy route, 18km : <https://www.parc-causses-du-quercy.fr/fiche-tourisme/a-velo-pour-nos-fossiles-boucle-sportive/>

Sportive route, 40km: <https://www.parc-causses-du-quercy.fr/fiche-tourisme/a-velo-pour-nos-fossiles-boucle-familiale/>

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Children meet *Peratherium lavergnense* in the hamlet of Lavergne in the village of Concots



The sculpture of *Bachitherium* at Patrick Médéric's workshop



Chablais UNESCO Global Geopark, France

What is Nature? Geodiversity and Biodiversity for the Public, Decision Makers, Partners and Schools



The communication tool developed by the Chablais UGGp for presenting the key concepts of geodiversity linked to the local region © SIAC

Responsible, long term sustainable development is contingent upon a rounded understanding of the Earth and all its integrated processes. The Chablais UNESCO Global Geopark (UGGp) has been working around the sustainable development goals 14 (Life below water) and 15 (Life on land) to improve stakeholder understanding of nature for improved management of the region's natural heritage.

Although integrated notions of nature have long been shared by prominent scientists, our society today is steadily constraining the holistic notions behind this term. The non-living, abiotic component often is disregarded in favour of plants, animals, and other living organisms. Interestingly the term "biodiversity", despite being a technical term, is now common in the vocabulary of the general public.

The Chablais UGGp chose to work on the notion of geodiversity to highlight the mineral part of the ecosystem and therefore to facilitate a broader conversation around nature. Daily decisions are being made around protected areas, resource use, infrastructure development etc. and frequently these do not consider the contribution of geodiversity. It

can be argued that these decisions could be longer lasting and have greater impact if they were based on an appreciation of all aspects of nature.

To start from basics the Chablais UGGp team developed a simple communication tool that distilled the elements of geodiversity (geological, geomorphological and soil features) using examples from our area. We showed how geodiversity links with fauna, flora, climate and human activity. We highlighted that, although poorly known geodiversity in fact is enshrined in the Environment Law of the French state.

To start the conversation we chose, as a first step, to work on the links between biodiversity and geodiversity – highlighting how the two are interdependent. We shared the concept with local decision makers and the local population in briefs and articles, provided training to our 40 official Chablais UGGp guides, used it as the theme of EGN Week, developed workshops for schools and used it to structure our participation in the National Science Week.

We found that the public were interested to learn about geodiversity and that they had not appreciated its contribution to their daily lives, nor the environment around them. The links between geodiversity and biodiversity generated many questions and much surprise. Technical partners appreciated the extra dimension that geodiversity considerations brought to the table and the rational it could contribute, for example to defining the limits of protected areas.

The success of the Chablais UGGp work was built on the diversity of different approaches used, tailored to the different Geopark audiences: schools, public, decision makers, partners. The Geopark will continue to move forward this essential work to continue to build a dialogue around all-nature, to explore geodiversity and to use a multi-year, multi-tool approach to support long term sustainable development in the Chablais region and beyond.

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A public fieldtrip learning about the unique habitat of the Baie de Coudrée, its geodiversity and biodiversity

© D. Dalencon

Official Geopark guides being trained about the topic of nature, geodiversity and biodiversity

© L. Canet



Chelmos- Vouraikos UNESCO Global Geopark, Greece Education on Climate Change and Natural Disasters - Empowering the Future in the Hands of Youth



Presentation on climate change and natural disasters at the Geopark of Chelmos Vouraikos, in the Physics laboratory of Arsakeio High School in Patras.

Climate change and natural disasters pose significant challenges that require strategic actions for public awareness and education. Geoparks emerge as valuable allies in this endeavor, providing a framework for educational information on environmental issues.

The Chelmos-Vouraikos UNESCO Global Geopark stands as a place that possesses unique geodiversity and biodiversity but also represents a vulnerable world. Threats of climate change, such as an increased risk of wildfires, floods, and landslides, jeopardize the rich ecosystems of the region. The protection of this environment requires more than simple awareness. It demands education, and this is precisely the role that informative sessions, such as the one organised at Arsakeio High School, play. Through carefully designed programmes, students gain a profound understanding of the challenges faced by the Geopark. The context of this session consists of part of the actions of the Sustainable School. The community of Arsakeio High School in Patras recognizes the importance of sustainability and provides its students with the opportunity to contribute to environmental protection. Educa-

tion is the most powerful tool in addressing the challenges posed by climate change and natural disasters. Understanding the factors contributing to these threats allows the community to develop effective protection strategies.

In conclusion, education entrusts youth with the responsibility for the planet's future. Through awareness and knowledge gained, they are empowered to act as agents of change and guardians of the environment. In an era where nature faces challenges, education emerges as the path towards a more sustainable future. The students of Arsakeio High School in Patras take steps towards this direction, with the Chelmos-Vouraikos UNESCO Global Geopark being their first destination on this educational journey.

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Eisenwurzen UNESCO Global Geopark, Austria Eisenwurzen, Idrija, Odsherred and Magma Geoparks work together on an Erasmus+ project about the further development of good and practical geology lessons



The GeoExplorer Toolkit prototype, available for schools and other educational purposes.

Photo © UGGP.

Who can still remember their own science, biology or geography lessons? You learn a lot about humans, animals, plants, and micro-organisms, about countries, politics, and economics, but one topic that appears in all of these subjects but too often remains as marginal is geology.

With the Erasmus+ project «Young European GeoExplorer», the four Geoparks set the goal of tackling this problem from the bottom up. Together with partner schools from Austria, Norway, Denmark and Slovenia, the project has so far investigated what is needed for good geology and science teaching and how the topic can also



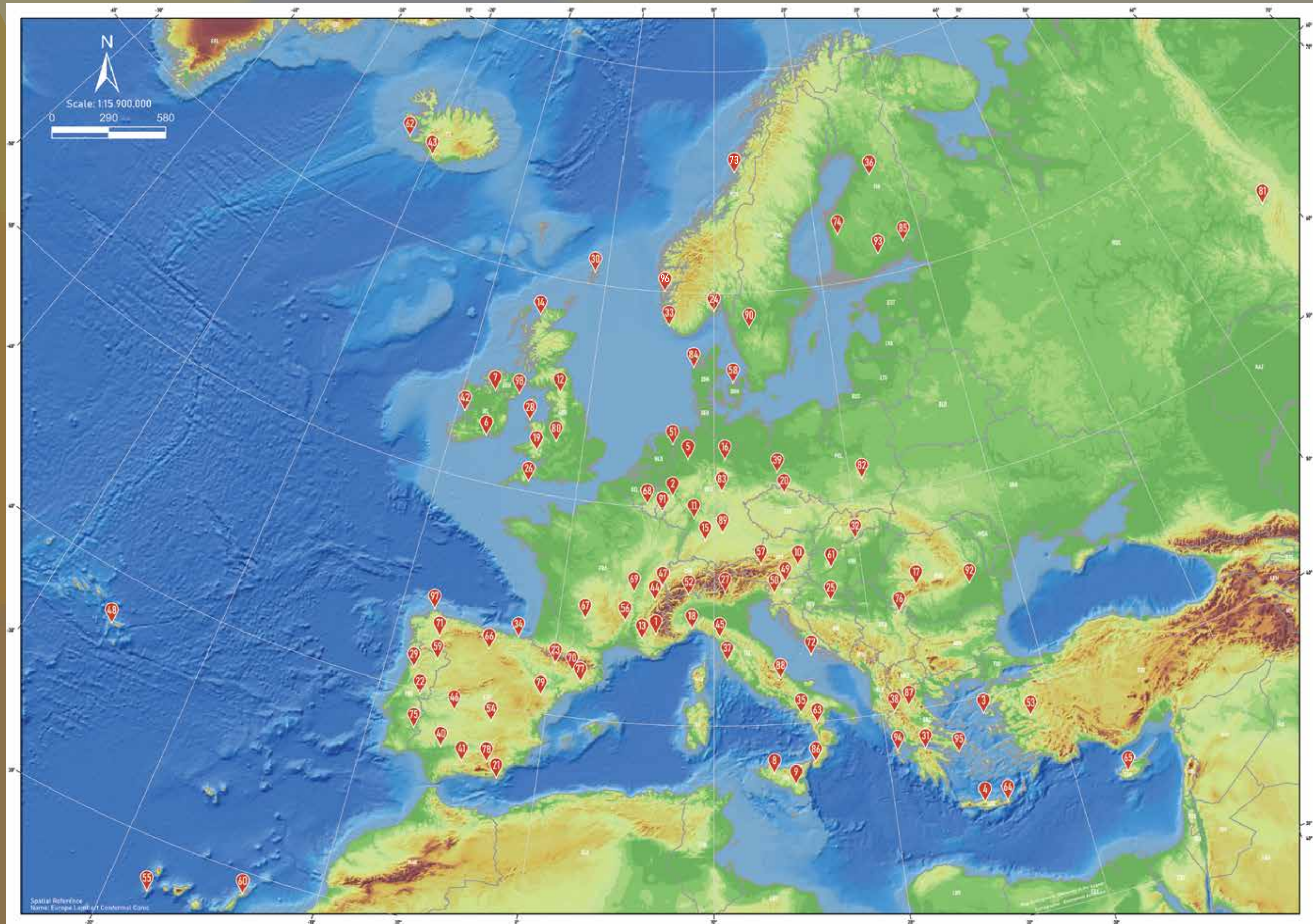
be incorporated into foreign language teaching. It was found that, for example, the weather is a main factor that prevents teachers from holding lessons outdoors and that there is often a lack of material for practical geology lessons. In addition, the equipment teachers and nature teachers would like to have for a successful lesson was addressed. As a result, a «GeoExplorer Toolkit» is currently being developed, which will contain all the essential tools and illustrative materials for both outdoor and classroom teaching. From now on the toolkits are tested with teachers and pupils and are available from for borrowing from the corresponding Geoparks.

Contact: Gabriel Kirchmair- g.kirchmair@eisenwurzen.com UNESCO Global Geopark Styrian Eisenwurzen, Austria (lead partner), <https://www.eisenwurzen.com/en/mein-natur-und-geopark/young-europeangeoexplorer/> This project is Co-Funded by the European Union.

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The Project logo.

The European Geoparks Network today



The Network consists of 98 Geoparks in 28 European countries
www.europeangeoparks.org



No. Geopark	Country	Year
1 Haute-Provence Geopark	France	2004
2 Vulkaneifel Geopark	Germany	2004
3 Lesvos Island Geopark	Greece	2004
4 Psiloritis Natural Park Geopark	Greece	2004
5 Terra vita Geopark	Germany	2004
6 Copper Coast Geopark	R.Ireland	2004
7 Cuilcagh Lakelands Geopark	N.Ireland & R.Ireland	2004
8 Madonie Natural Park Geopark	Italy	2004
9 Rocca Di Cerere Geopark	Italy	2004
10 Styrian Eisenwurzen Geopark	Austria	2004
11 Bergstrasse-Odenwald Geopark	Germany	2004
12 North Pennines AONB Geopark	England UK	2004
13 Luberon Geopark	France	2005
14 North West Highlands Geopark	Scotland UK	2005
15 Swabian Albs Geopark	Germany	2005
16 Harz Braunschweiger Land Geopark	Germany	2005
17 Hateg Country Dinosaur Geopark	Romania	2005
18 Beigua Geopark	Italy	2005
19 Fforest Fawr Geopark	Wales UK	2005
20 Bohemian Paradise Geopark	Czech Republic	2005
21 Cabo de Gata Geopark	Spain	2006
22 Naturtejo Geopark	Portugal	2006
23 Sobrarbe-Pirineos Geopark	Spain	2006
24 Gea-Norvegica Geopark	Norway	2006
25 Papuk Geopark Geopark	Croatia	2007
26 English Riviera Geopark	England UK	2007
27 Adamello Brenta Geopark	Italy	2008
28 Geo Mon Geopark	Wales UK	2009
29 Arouca Geopark	Portugal	2009
30 Shetland Geopark	Scotland UK	2009
31 Chelmos-Vouraikos Geopark	Greece	2009
32 Novohrad-Nograd Geopark	Hungary & Slovakia	2010
33 Magma Geopark	Norway	2010
34 Basque Coast Geopark	Spain	2010
35 Cilento, Vallo di Diano e Alburni Geopark	Italy	2010
36 Rokua Geopark	Finland	2010
37 Tuscan Mining Park Geopark	Italy	2010
38 Vikos-Aoos Geopark	Greece	2010
39 Muskau Faltenbogen / Łuk Mużakowa Geopark	Germany & Poland	2011
40 Sierra Norte de Sevilla Natural Park Geopark	Spain	2011
41 Sierras Subéticas Geopark	Spain	2006
42 Burren and Cliffs of Moher Geopark	R.Ireland	2011
43 Katla Geopark	Iceland	2011
44 Massif des Bauges Geopark	France	2011
45 Alpi Apuani Geopark	Italy	2011
46 Villuercas Ibores Jara Geopark	Spain	2011
47 Chablais Geopark	France	2012
48 Azores Geopark	Portugal	2013
49 Karavanke/Karawanken Geopark	Slovenia & Austria	2013

No. Geopark	Country	Year
50 Idrija Geopark	Slovenia	2013
51 De Hondsrug Geopark	Netherlands	2013
52 Sesia-Val Grande Geopark	Italy	2013
53 Kula-Salihli Geopark	Turkey	2013
54 Molina and Alto Tajo Geopark	Spain	2014
55 El Hierro Global Geopark	Spain	2014
56 Monts d'Ardeche Geopark	France	2014
57 Ore of the Alps Geopark	Austria	2014
58 Odsherred Geopark	Denmark	2014
59 Terras de Cavaleiros Geopark	Portugal	2014
60 Lanzarote and Chinijo Islands Geopark	Spain	2015
61 Bakony-Balaton Geopark	Hungary	2012
62 Reykjanes Geopark	Iceland	2015
63 Pollino Geopark	Italy	2015
64 Sitia Geopark	Greece	2015
65 Troodos Geopark	Cyprus	2015
66 Las Loras Geopark	Spain	2017
67 Causse du Quercy Geopark	France	2017
68 Famenne-Ardenne Geopark	Belgium	2018
69 Beaujolais Geopark	France	2018
70 Origens Geopark	Spain	2018
71 Courel Mountain Geopark	Spain	2019
72 Vis Archipelago Geopark	Croatia	2019
73 Trollfjell Geopark	Norway	2019
74 Lauhanvuori-Hämeen kangas Geopark	Finland	2020
75 Estrela Geopark	Portugal	2020
76 Djerdap Geopark	Serbia	2020
77 Central Catalonia Geopark	Spain	2012
78 Granada Geopark	Spain	2020
79 Maestrazgo Geopark	Spain	2020
80 Black Country Geopark	England UK	2020
81 Yangan-Tau Geopark	Russian Federation	2020
82 Holy Cross Mountains Geopark	Poland	2021
83 Thuringia Inselberg-Drei Gleichen Geopark	Germany	2021
84 Vestjylland Geopark	Denmark	2021
85 Saimaa Geopark	Finland	2021
86 Aspromonte Geopark	Italy	2021
87 Grevena Kozani Geopark	Greece	2021
88 Maiella Geopark	Italy	2021
89 Ries Geopark	Germany	2022
90 Platåbergens Geopark	Sweden	2022
91 Möllerdall Geopark	Luxemburg	2022
92 Buzău Land Geopark	Romania	2022
93 Salpausselkä Geopark	Finland	2022
94 Kefalonia-Ithaca Geopark	Greece	2022
95 Lavreotiki Geopark	Greece	2023
96 Sunnhordland Geopark	Norway	2023
97 Cabo Ortegal Geopark	Spain	2023
98 Mourne Gullion Strangford Geopark	UK & N.Ireland	2023



Maestrazgo UNESCO Global Geopark, Spain

Responsible geoclimbing

The calcareous sharp subvertical «knives» of Las hoces del Guadalope Geosite offers a wonderful scenario for geoclimbing.

Photo: © Alberto Sánchez



In autumn 2023, the I Climbers Meeting in the Maestrazgo took place in Villarluengo, a geological epicentre of the Maestrazgo UNESCO Global Geopark (UGGp). These two days involving a meeting of almost 100 participants represents an important milestone for the history of climbing in the territory where geology and traditional climbing went hand in hand. Responsible geoclimbing, in balance and respect for nature was promoted, encouraging future climbers and the local population to get to know their environment in a different way.

The landscape identity and the most important reliefs within the Maestrazgo UGGp, located in the Iberian Mountain Range, are part of the Mesozoic succession deposited during the Late Cretaceous (Cenomanian-Turonian) in shallow marine environments. These outcrops have a calcareous lithology mainly dominated by the presence of limestones and dolomites. Thanks to the cohesion of its minerals, the calcareous material's mechanical resistance to erosion gives rise to the steep reliefs of the Geopark. To a lesser extent we also find significant reliefs linked to the Early Cretaceous (Aptian) and Late Jurassic limestones, and even Cenozoic con-

glomerates that are also of great interest for the climbers.

Geoscience allows us to recreate the extraordinary historical narrative that transformed these Late Cretaceous marine sediments deposited horizontally c.90 million years ago into folded strata perched on mountain ranges as a consequence of the convergence and collision between the Eurasian plate and the Iberian microplate during the Alpine Orogeny. Giving a geological context to this reality, some walls with classic climbing routes of more than 200 metres high in an almost vertical position associated with the limb of a synclinal fold in the Órganos de Montoro Natural Monument, an iconic landscape of the Maestrazgo Geopark, were climbed.

The climbing guidebook «Escaladas insólitas del Maestrazgo de Teruel» [Unusual climbs of the Maestrazgo of Teruel] (Magallón, J., 2023) was presented during the meeting. The guide collects and reviews climbing routes opened since 1970 and presents other new routes that were developed revealing a potential of 220 climbing routes along - and above - 37 kilometers in the Maestrazgo Geopark.

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During the I Climbers Meeting in the Maestrazgo was presented the climbing guidebook «Unusual climbs of the Maestrazgo de Teruel»

Photo: © Editorial Desnivel.



Photo winner of the International Mountain Day 2022 contest organized by the Maestrazgo UGGp: Cumbre del Cimborrio [The dome's summit] (Villarluengo, Maestrazgo UGGp).

Photo: © Pilar Catalán

University
Centre part of
South Devon
College a Core
Partner of
ERUGp since
2019.

Richard
Stratford, Head
of Projects and
Partnerships
and Matt
Green, Head
of Commercial
Services and
Sustainability
share
information of
the integration
of the SDG's and
Geopark across
all aspects of
college life
including the
new degree
scheme.

English Riviera UNESCO Global Geopark, UK Forging a path to support future socio-environmental change in one of Earth's extraordinary places and beyond



Laura Roberts,
a University
Centre South
Devon graduate
who focused on
the impact of
marine vessels
on harbour
porpoise.



and apprenticeship where place-based experiences are at the heart of the teaching practice.

Making a difference through teaching global environmental change and sustainability through a holistic and integrated approach is at the foundation of this new programme. By covering a wide range of subjects including environmental justice, rewilding, protected areas, social changes, planetary citizenship, sustainable development, eco-psychology and environmental policy, students will gain a comprehensive study of our socio-ecological systems. Students will learn about sustainability and the three overlapping issues of sustainable development – environmental, social, and economic. To this end, the United Nations' sustainable development goals (SDGs) will be explored as an overarching theme within the delivery (United Nations (UN) 2015).

In a world that is increasingly affected by global social and environmental change, the new degree will allow students to understand pressing challenges at a range of scales, from local up to global, so they can become key actors to build and empower resilient communities. After completion, students will be able to work effectively within a diverse range of careers including environmental policy and reform, sustainable business, transformative education, consultancy, humanitarian response, corporate responsibility, civil service, NGOs, or charities. The foundation degree would offer preparation for these roles, as well as offering preparation for sustainable practitioners' roles through the apprenticeship. By focusing on supporting sustainable communities through transformative education, this new programme at UCSD aims to contribute to sustainable development and reshape human's relationships with the planet to build resilient futures for all.

Building on its collaboration with the Geopark, and integration of the UNESCO Sustainable Development Goals into everyday practice, South Devon College, and UCSD commit to continuously improve their sustainability approach, through the promotion of environmental awareness and responsibility, and embedding sustainability principles in their teaching. This new foundation degree and apprenticeship intends to develop student's knowledge and understanding of all aspects of Global Change, Sustainability and Society. This degree is also closely linked with the ambitions of the UNESCO Geoparks to raise awareness and develop an understanding of the key issues our societies are facing. Situated within the English Riviera UNESCO Global Geopark, UCSD will be at the forefront of teaching sustainability through this new foundation degree

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South Devon college students.



Famenne-Ardenne UNESCO Global Geopark, Belgium Use of LIDAR scans as a source of research and scientific mediation in karstic sites – the example of Hotton cave

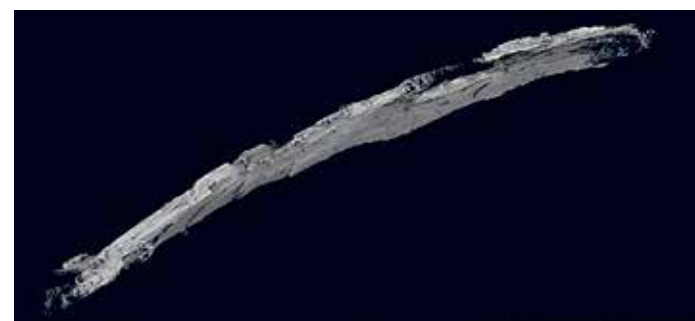


The cave's
underground
river.

Photo by G. Rochez.

Point cloud
restitution after
the first survey
session. The
image clearly
shows the high,
narrow shape of
the conduit, but
also a certain
curvature
that has not
been well
documented
until now

(Guy Van Retergem,
2023)



The use of 3D LIDAR acquisition is on the increase in karst environments, and not just for heritage reasons in 'archaeological' caves. Indeed, 3D imagery offers a wide range of possibilities: geo-heritage archives, geological, archaeological and geomechanical studies, scientific dissemination, facsimile production, virtual reality (VR), etc.

One of the Geopark's three show caves offers visitors a view of a remarkable underground passageway just a few metres wide, over 35 m high and 170 m long, giving the impression of a formidable underground canyon. Due to a lack of perspective, visitors have only a limited understanding of this morphology.

A survey campaign using a Faro lidar has just begun in the Hotton cave, a fitting way to celebrate the 65th anniversary of its discovery.

The operation is the result of close collaboration



installation of the Faro lidar
scanner.

Photo by S. Delaby.

between Belgian speleologists and topographers, the site operators, the geology department of the Université Libre de Bruxelles (ULB) and the UNESCO Global Geopark Famenne Ardenne. In this project, the LIDAR acquisition carried out by Guy Van Retergem has a threefold aim.

- Firstly, to obtain a detailed 3D map of the canyon and the tourist section of the cave. This archive is a survey of the site at the present time, which can be used for conservation purposes, to map submergence areas (during major floods) or for stability studies (quantification of gravity or neotectonic movements, ...).

- Secondly, it will be used to produce a geological and structural map of the cave (Master thesis in geology, at ULB).

- Finally, this scan should enable the underground canyon to be better rendered for visitors. This aspect is of great interest to both the Geopark and the operator, as it offers new ways of disseminating scientific information to highlight this geosite: online, in the reception building, and perhaps in the form of a mini facsimile or by virtual reality.

The project is due to come to an end in 2024, but it is already showing great potential (fig. 03) and will no doubt be extended to other karstic sites in the Geopark at a later date.

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Gea Norvegica UNESCO Global Geopark, Norway

Defeating plastic pollution and restoring coastal beauty



Beach cleaners Ståle and Bjorn loading the workboat with the "catch of the day".

The ocean is the planet's largest ecosystem, holding the keys to an equitable and sustainable future for our planet, but only if we take care of it and protect it. That is why we are currently engaged in the United Nations Decade of Ocean Science for Sustainable Development (2021 – 2030).

Norway has one of the world's longest coastlines, and Gea Norvegica UGGp is situated along its south-eastern part. Since 2018 our Geopark has worked continuously on reducing the degree of plastic pollution and pollution in general along our shoreline, by facilitating countless beach cleaning days for our local school students, giving them the possibility to learn, take action, and together make a difference.

In 2021 the Norwegian Retailers' Environment fund established Norway's first national coastal cleanup programme, Clean-up Norway (Rydd Norge). Through the programme, 40 percent of the outer shores of Norway and Svalbard would be cleared of macroplastics (larger than 2,5 cm in size) by the end of 2023. An historic initiative and to this day the largest of its kind. The programme was divided into ten regional

projects, in which Gea Norvegica UGGp was selected to carry out the programme within one of them. Our professional coastal clean-up programme kicked off in March 2022, with a crew of four dedicated fulltime employees, a 17 feet long workboat and an audacious goal to remove 30,000 kg of marine litter from a 104 km coastline. Through fifteen months of hard work the project was finished in June 2023, resulting in the removal of more than 40,000 kg of marine litter, and a total of 172 km of coastline cleared of waste.

This was the first 40 percent of our outer shores, and from 2024 to 2026 an additional 30 percent will be cleaned. We are proud of what we are achieving and grateful to have the possibility to make a difference. By clearing our coastline of plastic pollution, we are contributing to protect both life below water and life on land (UN Sustainable Development Goals 14 and 15), as well as restoring and preserving our heritage.

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Plastic fibres from disintegrated ropes seen as building material in a bird nest.



Thirtyseven years of roaming the seas has come to an end.



Harz • Braunschweiger Land • Ostfalen

UNESCO Global Geopark, Germany

Geoparks: Individuality through unique geosites (geotopes)



The Golden Spike is hammered into the Salder quarry during the award ceremony. Award event at the Salzgitte Salder quarry.

©LBEG_Eike Bruns

The basis of life for everything: Stromatolites on the Heeseberg-Heeseberg Quarry

©Geopark HBLO_Henning Zellmer

In 2023, the Geopark Harz . Braunschweiger Land . Ostfalen received a special honour. In the area of the world's second largest UNESCO Global Geopark, there is now an internationally significant reference point marking the boundary between the two Cretaceous Turonian and Coniacian Stages. The International Union of Geological Sciences has determined that nowhere else can this time boundary be better identified than in the quarry near Salzgitte-Salder in Lower Saxony, Germany, and has awarded the Global Stratotype Section and Point (GSSP). The so-called «Golden Spike» was awarded in a festive ceremony. The testing process is very complex. Numerous qualitative criteria are required to identify such layer transitions. The scientific investigation found out that at this site the shell of the Inoceramus species *Cremnoceramus deformis erectus* appeared for the first time. Additional markers are further occurrences of bivalves and microfossils and a characteristic change in carbon isotopes. Besides Schöneck-Wetteldorf (Prümer Mulde, Rheinland-Pfalz), Salzgitte-Salder is the second GSSP in Germany. Worldwide there are 73 reference points.

The quarry here exemplifies what can be discovered from geotopes. It is only one of many in the Geopark Harz . Braunschweiger Land . Ostfalen. Other

geotopes, like the Kellwasser outcrop, where the late Devonian extinction was first described, or the stromatolites of Heeseberg quarry are of scientific importance in the Geopark. Therefore, geoparks must serve the task of geotope protection to conserve important sites for future generations. Geotope protection does not only include maintenance. Rather, geotopes serve as a basis for scientific research. They are examples of the transformation from the extractive use of geological resources. Some are purposefully exposed under a sustainable infrastructure and designed as extracurricular learning sites and serve to teach Education for Sustainable Development (ESD). Decommissioned geotopes can create new habitats for animals and plants. High importance was also attributed to the definition of geotopes

«Geotopes are Earth-historical formations of inanimate nature that provide insights into the development of the Earth and life. They include outcrops of rocks, soils, minerals and fossils as well as individual natural creations and natural parts of the landscape. Geotopes are worthy of protection if they are characterized by their special geological significance, rarity, peculiarity or beauty. For science, research and teaching as well as for nature and local history they are documents of special value. They may require legal protection especially if they are endangered and comparable geotopes are not available to compensate.» (Ad-hoc-AG Geotopschutz, 1996)

With geotopes, we geoparks possess a unique basis, which distinguishes us from other institutions and environmental organisations, and provides a direct experience of geology. It is the basis for our ecosystem, our nature as well as our cultural and economic history. The Geoparks use this special feature and thus contribute their part in an ESD programme.

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©Geopark HBLO_RVH

The late Devonian extinction was first described at the Kellwasser outcrop. Kellwasser outcrop



Idrija UNESCO Global Geopark, Slovenia Idrija Geopark – 10 years in the excellent company of UNESCO Global Geoparks from around the world



In 2023, Idrija Geopark celebrated its tenth anniversary with a press conference held on November 21, 2023. During the conference, Geopark representatives showcased the Geopark's development, outlined its activities, and discussed future operational goals. Following the conference, a celebration event took place at the Idrija Film Theatre. Distinguished speakers, including Valerija Božič, the director of Geopark Idrija, Tomaž Vencelj, the Mayor of the municipality of Idrija, and Gašper Hrastelj, the Director of the Office for UNESCO and Secretary-General of the Slovenian National Commission for UNESCO, reflected on the beginnings and the development of Idrija Geopark.

The event also focused on the Idrija Selected collective trademark. During the event, the certificates for 2023 were awarded by Ilona Stermecki, representative of the Academy »Authentic from Slovenia«. Idrija Selected trademark welcomed 34 new products, which were submitted by 17 providers.

As part of the celebration, the Idrija Geopark, in collaboration with a local provider, Pivovarna Zajc (Zajc Brewery), introduced a special beer named »Bant«. The name, derived from the local dialect, signifies »stone« and eloquently represents the Geopark's geological heritage. Attendees of the celebration had the opportunity to taste the unique beer and other local delicacies during the banquet that concluded the celebration.

Beyond its UNESCO Global Geoparks Network membership, Idrija Geopark achieved several milestones in the past decade. The Geopark's staff actively participated in numerous conferences and meetings, published professional papers, and engaged in various international projects. Notable accomplishments included the opening of the Geopark's Visitor Centre with the exhibition Written in Rocks and the establishment of the »Idrija Selected« collective trademark. Idrija Selected currently encompasses 45 providers with 82 handicraft products, 86 food items, 9 catered dishes, 4



experiences, and 1 event, fostering connections among local stakeholders.

Idrija Geopark also organised numerous events during its ten-year journey. The annual Network of Schools, workshops, and other children's activities engaged over 3500 children and youngsters. Additionally, the Geopark orchestrated over 100 events as part of the European Geoparks Week, attracting more than 6000 participants. Numerous workshops, presentations, hikes, guided tours, and similar events were also organised on other occasions, attracting thousand of additional visitors, further enriching the Geopark's vibrant history.

In just over ten years, the concept of a geopark has given birth to the Idrija Geopark as we know it today. Linked with various stakeholders - the Geopark partners - it is responsible for the protection, education, and popularization of the geological and other natural and cultural heritage and the sustainable development of the Idrija region. With our joint efforts and commitment, we have created a rich 10 years of activity and are already planning for the future.

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Guests at the celebration event.

»Bant« - special edition beer from Zajc Brewery.

Providers, awarded the Idrija selected certificate.



Karawanken / Karavanke UNESCO Global Geopark, Austria/Slovenia

European Union-Funded Mining Robot Achieves Remarkable Success in Slovenia Field Trials

Highlights from the mining robot testing in Mežica.

Photo by Urosh Grabner.



In October 2023, a prototype robot for autonomous mining was successfully tested in Slovenia, in the area of Karavanke UNESCO Global Geopark (former underground mines of lead and zinc Mežica and Žerjav) within the framework of the Horizon2020 project ROBOMINERS. The aim of the project was to develop a technology that would enable fully autonomous mining in the future in environments that are unsuitable for humans, e.g. deep in the Earth's crust, under the surface of the sea, or on extraterrestrial bodies. Testing in the former mines represented a key milestone in the project, as it was the first time that certain components of the robot were tested outside the laboratory, in the real environment of an underground mine.

The main objective of the ROBOMINERS project, which started in June 2019, was to radically change the way raw materials are extracted, including strategic and critical raw materials that are key to the European Union's planned green transition. The EU is heavily dependent on imports for many raw materials and wants to increase its domestic supply. A consortium of 14 partners from 11 European countries has been developing state-of-the-art autonomous robotic mining technology for mineral deposits that are unsuitable for conventional mining methods. Developments in automation, sensors and artificial intelligence have played a key role.

The prototype RM-1 robot developed in the project boasts a wide range of functions, including navigation, sensing, excavation, material transport and real-time material analysis. Testing of this prototype in real-world environments has provided key information for further development and improvements in the future.

The field experiments carried out in the underground lead and zinc mines in Mežica and Žerjav focused mainly on testing various sensors that allow the robot to detect

Highlights from the mining robot testing in Mežica.
Photo by Urosh Grabner.

Photo: Urosh Grabner



Highlights from the mining robot testing in Mežica.

Photo by Urosh Grabner.

its surroundings, which is necessary for autonomous decisions. Through testing and demonstrations, the ROBOMINERS project team has obtained reliable data to assess the success of the project and the next steps on the road to developing a fully autonomous and automated mining system.

According to Project coordinator Claudio Rossi, from the Universidad Politécnica de Madrid, »After four years of dedicated work, numerous pieces have seamlessly converged, culminating in successful real-world testing that validates our earlier laboratory findings and focused field tests. Throughout 2022, our efforts were predominantly concentrated in the lab, where we fine-tuned the production tool, honed navigation and geological modeling, and conducted field trials in a Belgian mine to assess geophysical sensors and the RM3 robotic platform's touch-based sensors for 3D mapping and navigation. Furthermore, we rigorously tested real-time slurry analysis mineralogical sensors in a controlled experimental setup at K-UTEC, employing a slurry circulation system equipped with LIBS sensors. In the recent field trials, we had the opportunity to showcase a multitude of the RM1 mining robot's functionalities and engage in vital dissemination activities.«

The results of the ROBOMINERS project will contribute to reducing the European Union's dependence on imports of many mineral raw materials, as it will be possible to restart the production of raw materials within the European Union in a way that minimises the impact of mining on the environment and on people.

The main organiser of the equipment tests at the Mežica and Žerjav mines was the project partner, the Geological Survey of Slovenia from Ljubljana. Employees of Podzemlje Pece d. o. o. and Gradbeni materiali d. o. o. from Žerjav participated in the testing, facilitating the testing in their mines and supporting the team with their extensive knowledge of mining.

More information: www.robominers.eu
Social media: @ROBOMINERS

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Katla UNESCO Global Geopark, Iceland

Mountain hiking in Hvolsskóli Geoschool, Katla Geopark



Kula Salihli UNESCO Global Geopark, Türkiye

Kula and Salihli are changing with the Geopark



The new visitor centre in Kula Divlit Volcanic Park.

Shows the four hiking groups from Hvolsvöllur elementary school in the fall of 2023.

The 1st grade (upper left) hiked Mt. Stóra-Dímon, 2nd-4th grade (upper right) hiked mt. Vatnsdalsfjall, 5th-7th grade (lower left) hiked Mt. Þórólfsfell, and the 8th-10th grade (lower right) hiked Mt. Þríhyrningur.

Hvolsskóli school (grades 1-10), a Geoschool of Katla Geopark, has for the last 11 years had the school programme “tíu tinda ganga”, or the “ten peak hikes”. The programme involves all students at the school and consists of students hiking one mountain each school year. The school itself is in the town of Hvolsvöllur in the municipality of Rangárþing eystra, in the western part of Katla Geopark, and each mountain they hike is within the municipality. The hikes occur during one day in the fall, and by the end of their 10 years at the school, each student will have hiked ten different mountains. The fall of 2023 marked the 11th year of the project, with last year’s graduating students being the first students having hiked all of the ten mountains. For the hiking, the students are split into four groups depending on which grade they are in. The 1st grade hikes Mt. Stóra-Dímon each year, 2nd-4th grade hikes the mountains of Lambafell, Háamúli and Vatnsdalsfjall, 5th-7th grade hikes Fagradell, Hrótkollur and Þórólfsfell, and finally the 8th-10th grade hike Drangshlíðartindur, Einhyrningur and Þríhyrningur. A few years ago, the kindergarten in Hvolsvöllur decided to join the programme and now the oldest children at the kindergarten hike up Mt. Hvolfsfjall, on the same day as the students hike their mountains. Teachers from the school lead the hikes with the students, and

parents and other family members can also join.

The aim of the project is to get students interested in healthy lifestyles, the outdoors and the nature and geology of the area. Last year, an agreement between Hvolsskóli and Katla Geopark was made, where the Geopark will produce an information guide on each of the mountains that the school hikes. Each guide will explain how the mountain was formed and explain the main geological formations that can be seen near the hiking trail on the mountains. The guide is for the teachers at the school, so they can explain the geology to the students during the hikes. The mountains are all relatively young formations, being younger than 780,000 years and most of them much younger than that. They are all part of the Móberg formation (the Palagonite Formation) in Iceland, having formed in volcanic eruptions underneath the ice age glaciers where the erupting magma interacted with the meltwater from the ice. The students learn therefore about lava and ice interactions, tuya and tindar formations, how pillow lava, palagonite and basalt columns are formed, and about the three volcanic systems that formed these mountains, the systems of Tindfjallajökull, Eyjafjallajökull and Katla.

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Kula Geopark became a Global Geopark in 2013 and it expanded its territory, evolving into the Kula Salihli Global Geopark in 2019. In fact, the region’s UNESCO Global Geopark designation affirms not only its geological value but also its role as a major force behind tourism-related socioeconomic and cultural development. Before its designation as a Geopark, Kula was a small Anatolian town with few tourism connections, whereas Salihli largely engaged in tourism activities related to archaeological sites.

The Geopark was critical in differentiating the region. It primarily promoted awareness among the local population about tourism as an alternative economic activity. Local goods continued to be promoted to tourists, and the number of visitors to the Geopark expanded dramatically over time (The number of visitors after the pandemic is around 100,000).

The Kula Divlit Volcanic Park, which attracts a huge number of visitors each year, is one of the Geopark’s main attractions. Therefore, a Visitor Centre in this area was established. The visitor centre comprises a cafeteria, souvenir shops, a seminar hall, and a Geopark Information Centre. The construction and furnishing of the visitor centre, which are substantially completed, are expected to add a new dimension to tourism activities within the Geopark in the future.

The Kula Salihli Geopark also contributes significantly to the socio-cultural development of both the local pop-

ulation and visitors through educational activities. The Geopark provides digital content, informative signs, and brochures to educate people about the Geopark. Furthermore, its ongoing education programme offers regular training sessions to middle and high school students on topics such as geoprotection, geoparks, sustainable development, natural disasters, natural resources, and their sustainable use, as well as clean energy sources. Additionally, special educational events are organized on important days to contribute to changing the perspectives of the local population on various issues.

The Geopark places particular importance on the education of children aged 6-8 in its educational activities. Within this context, six different storybooks have been prepared to entertain and educate these children on various topics. Following the philosophy of ‘bend the tree while it’s young,’ these books indirectly convey information about natural disasters such as volcanism, earthquakes, floods, forest fires, and cultural heritage elements. In this way, efforts are made to cultivate a generation that is more sensitive to the preservation of natural and cultural values.

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The story books for children from the ages of 6-8.



Educational activity covering the promotion of the Geopark to university students. - tuncerdemir20@hotmail.com

Lauhanvuori - Hämeen kangas UNESCO Global Geopark, Finland

Improving environmental education through network collaboration



Mari Fabig, mari.fabig@kankaanpaa.fi (principal of the Kankaanpää upper secondary school)

"A thin mist hovers over the mire, covering the tussocks and the bog holes. Hardly anything in the landscape is reminiscent of a prehistoric mountain range." The Lauhanvuori-Hämeen kangas Geopark's environmental education team had identified common development themes as guidelines for educational projects. The goal was to increase local knowledge regarding the geological, natural, and cultural heritage, and to increase the commitment and the desire to protect the environment through concrete actions. The key focus was to develop pupils' connection with nature by taking education outside the classroom.

"The mist is starting to clear. The sun rises slowly, a group of young people stop at the edge of the mire and talk about its history. From high fold mountains before the ice ages," six Geopark municipalities joined the project network that was managed by the town of Kankaanpää and that also operated internationally as part of the Naturenet network. Experiences and ideas were brought back from visits to the partner Geoparks in Germany and Austria, and some were also tested locally during the project. For example, students from the Kankaanpää Upper Secondary School participated in a Climate conference in Germany. Later, they held a science adventure day for primary school pupils.

"The others listen quietly to the students' story.

The words evoke images of the past, a time never to return." In the project network, models for nature trips to Geopark sites have been developed for pupils of different ages. For the youngest, gaining experiences of nature have been most important. The trips have been valuable learning experiences as well, where the youth have also participated in carrying things out.

"The landscape that seemed meaningless at the beginning of the journey gradually comes to life. The eye recognises ancient shores, dried glacial riverbeds, and salt ponds, combined with an understanding of water as a life-sustaining force." The project enabled schools in the Geopark area to conduct a long-term study on local water, as a dedicated research portal was developed. It is a follow-up study where fifth-grade students conduct structured water research annually in their chosen local waterways. Children gain the experience of generating real knowledge and learn to understand where researched information comes from.

"Elsewhere, small hands gently lift a sapling from its pot and place it in the hole in the ground. On an adjacent patch, two children sow seeds of meadow plants." The measures taken in the project also had direct environmental impacts. With the nature site adoption by Honkajoki schools, alternative habitats are shaped for species that have become rare in sunlit environments. Long-term nature site adoption provides an opportunity to personally contribute to the diversity of nature, thereby strengthening the confidence of children in the future.

"The students return to the bus. On the way back home, there is a stop to see the meadow patches planted years ago in the previously barren land and admire the abundance of flowers with many butterflies fluttering. This place will be returned to many times over the coming years." The project network enabled collaborative development for schools in the region, which would not otherwise have been possible. The project strengthened the involvement and environmental agency of both the school staff and the pupils who participated in the project activities.

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Students taking samples in Lauhanvuori - Hämeen kangas UGGp, Finland. Photo by Simo Tolvanen.



Lesvos Island UNESCO Global Geopark, Greece Biodiversity protection in the Lesvos Petrified Forest Parks



Wild Flora of the Lesvos Petrified Forest Park at thesis "Mpali Alonia".

Photo by Vasiliki Kakampoura).

The Lesvos Petrified Forest protected area includes several Petrified Forest Parks with facilities aiming to protect the fossil sites and their geodiversity as well as ensuring their accessibility to visitors. Apart of the impressive fossils sites hosting standing and recumbant fossil trees they also host a unique modern ecosystem with more than 400 plant species identified including rare and endemic species of wild orchids. The Lesvos Petrified Forest Parks provide rare habitats for orchids, and a natural treasure for native species, which create an ideal area for the observation and identification of the wild flora of western Lesvos.

The Lesvos Petrified Parks at "Mpali Alonia", is a major site hosting endemic wild orchids. In the spring the largest number of different flowering species, can be observed proving that the Lesvos Petrified Park is a unique global monument, that during spring is adorned with a colourful palate, making the open-air park of the Petrified Forest an enchanting landscape

for visitors, who are able to observe the protected species, due to their management of the Natural History Museum of Lesvos Petrified Forest.

The Natural History Museum of Lesvos Petrified Forest, having the responsibility for the operation of the Lesvos Petrified Forest Parks, has made the observation of the fossil sites a safe experience, due to the especially designed paved paths leading to the fossils sites and the implementation of protection measures, such as the fencing of the entire park and each fossil site, in order to prevent grazing and trampling of endemic and rare plants in the Park area, ensuring the sustainability of this rare habitat.

The Petrified Park's fence, which was recently replaced, separates the protected area from the surrounding pastures, protecting the wild flora and especially the largest and most important habi-

tat of the orchid *Ophrys lesbis* in Lesvos Island, which is one of the most characteristic species of orchids in Greece.

The Petrified Forest Park at the-sis "Mpali Alonia" has 15 different plant taxa of the Orchids family such as the species *Ophrys tenthredinifera*, *Ophrys tenthredinifera* ssp. *vilosa*, *Ophrys umbilicata*, *Ophrys papilionaceae* ssp. *heroica*, *Ophrys mammosa*, *Anacamptis collina*, *Anacamptis papilionacea* ssp. *aegaea*, *Anacamptis collina* var. *leucoglossa*, and also the species *Anacamptis sancta*. In the Park there are several species of *Serapias* such as *Serapias vomeracea* and *Serapias orientalis*, this one with two subspecies: the *Serapias orientalis* ssp. *carica* and the *Serapias orientalis* ssp. *sennii*.

The special habitat of the Petrified Forest Park of Lesvos can be an opportunity for research and education, as well as an ideal place for observing nature.

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Wild orchis at the Lesvos Petrified Forest Park at thesis "Mpali Alonia"

1. (*Ophrys lesbis*).
2. (*Anacamptis collina*).
3. (*Anacamptis papilionacea* ssp. *aegaea*).
4. (*Ophrys mammosa*).



Maiella UNESCO Global Geopark, Italy

Vola Volè: Viticulture, Microbiodiversity And Geodiversity



Intensive monoculture drastically reduces soil fertility and impoverishes the genetic diversity of plants, making crops more vulnerable. In viticulture the problem is not only monoculture, but also the deterioration of the soil due to bad cultivation techniques (intensive viticultural monoculture) with strong consequences on biodiversity and soil geodiversity. Instead, the Italian mountainous areas located right in the centre of the Mediterranean basin, such as the Maiella massif, are one of the areas in the world identified as «hot spots» for the diversity of life.

From these considerations the collaboration project between the winery Cantina Orsogna and the Maiella UNESCO Global Geopark focused on the yeasts was born. Most of the world's wines are obtained with the use of selected industrial yeasts and this generates a standardization in taste, instead, in this collaborative project, the selection of yeasts is carried out on the Maiella flora (fruits, berries and flowers) at different altitudes.

Altitude conditions and temperature determines a gradual change in the flora, fauna and even microbial life in mountain environments. Yeasts in nature are almost everywhere, on flowers and fruit. During the winter they survive inside the digestive system of hornets, bees, wasps, and other pollinating insects. The harvesting of fruits, berries and flower pollen is a journey into the biodiversity of the Maiella, a journey consisting of technical meetings, field research, laboratory evaluation and fermentation tests. The steps for selecting yeasts are as follows:

1 - Collection of pollen, fruits, and berries at different altitudes. The collection is entrusted to technicians from the Maiella Park and microbiologists.

2- The pollen, fruits and berries are macerated in a sterile must suitable for the development of yeasts.
3- The fermentation begins from the inoculated must.

4- The selected yeast is sown on a plate and multiplies and is produced in the form of an aqueous solution to be used in fermentations in the Orsogna winery.

5- Every year the selected yeast is stored in a stock library managed by the Cantina Orsogna and the Maiella Park with the aim of preserving the microbiological heritage for the year and the territory. The



yeasts are free from commercial patents and are available to everyone (private individuals and businesses) at the Maiella Seed Bank laboratory's stock library.

The result is an organic wine without added sulphites, fermented with local Maiella yeasts, the return to natural fermentation by autochthonous yeasts is a fundamental condition for creating a vintage of wine capable of restoring the authentic aromas and flavors of a territory.

Cantina Orsogna with the "Vola Volè Maiella National Park" project supports research on the progenitors of cultivated plants and the conservation activity of the agronomic biodiversity of the Germplasm Bank of the Maiella National Park. Vola Volè Makes a Difference!

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Harvesting berries for selecting yeasts that convert sugar into alcohol and CO₂.

Delivery of the selected yeast in Maiella UGGp.



Vola Volè Wine fermented with local Maiella yeasts.



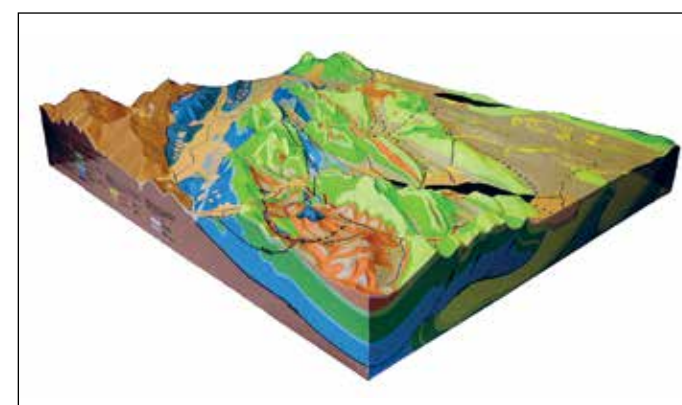
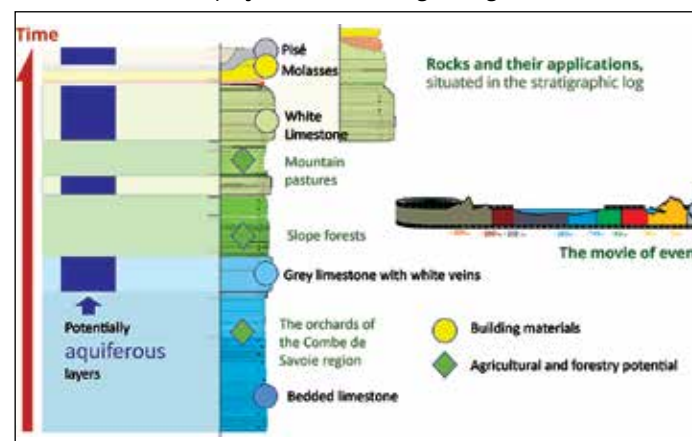
Massif des Bauges UNESCO Global Geopark, France

The whole Geopark in your rucksack! A foldable tarpaulin with all the resources you need to explain the Massif des Bauges



The Foldable tarpaulin, open and folded (140 x 140 cm).

Detail of the stratigraphic log with examples of applied geology.



The geological 3D model, available in several sites.

be stowed away in a rucksack or proudly displayed on the walls of a museum or gîte. Its graphic charter is consistent with that of the other tools, models, booklets, and interpretation panels on the sites. It uses the same colours and key figures and covers all the subjects related to geological heritage. It is rich in illustrations, photos, and diagrams, all of which serve as pretexts for discussion.

Four non-hierarchical themes are used to explore the content and make the link with the main visual component, the a geological model of the massif on which it is easy to locate oneself, draw on one's knowledge and find points of interest. The four themes are:

What is geological heritage? Examples are presented through objects (fossils), geosites and geological structures.

Resources used / usable: These are divided into two categories - mineral resources and their uses (past or present) - implications of the nature of the subsoil for agriculture and forestry.

Exposure to natural hazards illustrates the link between geological characteristics and the types of hazard in the area.

A fourth and important chapter is devoted to geological history, with different representations. Original diagrams are used to make this history easier to understand. We have tried to make it as understandable as possible, by making the link in the stratigraphic column with the uses of the rocks, or to connect these partial sedimentary records with the entire history of our region.

Eighteen copies of the tarpaulin were produced, most of which were sold to members of our two partner networks: a network of environmental educators and a network of socio-professionals in contact with the public.

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Mëllerdall UNESCO Global Geopark, Luxembourg Cultivation of malting barley - a contribution to the active protection of drinking water



**Partners
Drinking Water
Protection:**
regional
and national
stakeholders
work together
to protect the
region's drinking
water.

The Mëllerdall is known for its impressive rock formations and steep valleys, which are carved out by streams and rivers. The Luxembourg Sandstone forms one of the most impressive sandstone landscapes in Western Europe. One of the region's most important resources is found underground, our groundwater. Unnoticed, it makes its way through the pores and fissures of the Luxembourg Sandstone, which is up to 100 metres thick. The infiltrating water accumulates on the marly layer underneath the sandstone and flows towards the valleys on the gently inclined strata, where it returns to the surface as a spring. A number of these springs have been tapped by man and this water reaches the region's households as drinking water, the best controlled foodstuff. The region is self-sufficient in its drinking water supply: these springs are owned by the individual member municipalities of the Natur- & Geopark, which are responsible for the drinking water supply of their inhabitants.

The zones in which drinking water newly derived from precipitation are divided into drinking water protection zones. Zone I corresponds to the catchment, Zone II to the area from which the infiltrating water takes less than 50 days to reach the spring and Zone III to the area from which the infiltrating water reaches the spring



**Source_
drinking water:**
Groundwater
from the
Luxembourg
Sandstone make
the region self-
sufficient in
drinking water.

after more than 50 days. In these areas, measures are required by law to maintain the long-term quality of the drinking water. Since 2019, the Mëllerdall Natur- & Geopark, municipalities, farmers, agricultural advisors, authorities, and ministries have been working together to protect the drinking water. This gave rise to the idea of producing a regional beer, as malting barley, an essential raw material for brewing, grows in the fields. As an extensive crop that can cope with the sandy soils of the Mëllerdall and requires little fertiliser, malting barley is ideal for actively protecting the drinking water.

In 2022 a farmer from the agricultural cooperative Mëllerdall cultivated 1 ha of malting barley. The seed came from the Luxembourg Seed Growers' Co-operative, which also cleaned and stored the harvest. The brewing potential of the barley was tested and confirmed by the Technical University of Munich. The barley was then malted, i.e. germinated in a controlled manner to make the starch and proteins contained in the grain processable. The brewing was carried out by the Echternach brewery. «De Fläschgeescht - e Béier mat 100% Mëllerdaller Geescht», a Luxembourgish play on words was born: "Fläschgeescht" = "genie in a bottle", "Geescht" = "spirit" as well as "barley".

As this is a pilot project, the «Fläschgeescht» is mainly used to raise awareness at events organised by the Mëllerdall Natur- & Geopark and is not available on the market.

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Bottles of beer:
Cultivating
malting barley
contributes
to active
drinking water
protection and
the creation of
a new regional
product.



**Dedicated local
community
volunteers
involved in the
cultivation and
planting of
dune grasses.**

Mourne Gullion Strangford UNESCO Global Geopark Nature Based Solutions for Mourne Gullion Strangford Geopark's Dune Erosion



Mourne Gullion Strangford Geopark in Northern Ireland is inhabited by 182,074 people. Situated on the eastern coast of the UNESCO Global Geopark is the Murlough Special Area of Conservation (SAC), featuring a mosaic of dune systems. The Geopark spans over 1,931 km², with 1,637 km² on land and 294 km² in the marine environment. The Geoparks geological history can be accessed in <https://mournegullionstrangfordgeopark.com/about-our-geopark/our-geopark/>. The natural history, cultural heritage and industrial heritage can be accessed in <https://mournegullionstrangfordgeopark.com/about-our-geopark/our-biodiversity/>; <https://mournegullionstrangfordgeopark.com/about-our-geopark/our-people-and-culture/> respectively. The Geopark's Management and governance is described in <https://mournegullionstrangfordgeopark.com/about-us/our-governance/>.

The significance of the interplay between terrestrial and marine ecosystems along our coastline is increasingly apparent due to the impacts of climate change and rising sea levels. Elevated flooding, intensified weather events, and sea level rise are accelerating coastal processes, making geohazards more pronounced.

Tyrella beach, a vast expanse at the heart of the SAC, is a favoured destination within the Geopark for both locals and visitors. The 25-hectare sand dune system behind the upper shore is experiencing the impacts of coastal erosion. Mourne Gullion Strangford Geopark is employing nature-based solutions to address coastal erosion's severe impacts at a crucial point along our coastline.

While the dunes serve as a vital habitat for numerous plant and animal species, they also play a

key role in safeguarding the coastline from climate change impacts, especially coastal erosion. On the east coast of Ireland, with its soft, sedimentary coastline and local wave regime, coastal erosion is a recurring issue, causing damage to infrastructure, property, and agricultural land loss. The dunes act as a natural buffer between the land and the sea.

Traditional solutions like coastal armouring often result in unintended consequences, such as the loss of beach width and exacerbation of erosion along the coast. In anticipation of increased rates and extents of coastal erosion due to rising sea levels and more frequent storms caused by climate change, UNESCO Global Geoparks like ours must work to mitigate natural disasters, including coastal erosion. By employing environmentally friendly or nature-based defence options, we aim to restore natural resilience to our coast.

At Tyrella in Murlough SAC, sand fences, complemented by the planting of dune grasses supplied by the local seed conservation charity, True Harvest Seeds, and cultivated and planted by dedicated local community volunteers, serve to stabilize the sands in the dune. Acknowledging that the natural coastline stands as our most effective defence, we are committed to collaborating with nature to safeguard our coastline and mitigate the impacts of heightened storms, flooding, and erosion events.

In alignment with Sustainable Development Goal 13, which calls for urgent action against climate change and the building of knowledge and capacity to address it, our efforts at Tyrella exemplify a proactive approach. UNESCO Global Geoparks preserve records of past climate change within their rocks, concurrently acting as educators on current climate issues. By means of educational initiatives and awareness campaigns, we empower individuals with the understanding necessary to both mitigate and adapt to the effects of climate change.

Since the implementation of this nature-based solution, the dune has grown, and, more importantly, it has withstood three significant storms. The Geopark continues to monitor and evaluate the intervention. Follow the project's progress by visiting <https://mournegullionstrangfordgeopark.com/>

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**Recent erosion
along Mourne
Gullion
Strangford
Geopark
coastline.**



**Paths weaving
through the
Tyrella Dune
system.**

Muskau Faltenbogen / Łuk Mużakowa UNESCO Global Geopark, Germany and Poland

New Geopark exhibition «With dirt to prosperity» - Raw materials and industrial history in the Muskau Arch



The old
brickyard in
Klein Kölzig is
the Head Office
and Visitor
Centre of the
Geopark.

The Muskau Arch is a 20 x 22 km large terminal moraine that was formed by the 'Muskau Glacier' during the Ice Age. During its formation process, the Tertiary Period loose sediment layers were deformed by the weight of the ice, i.e. the force acted vertically on the Earth's surface and then pushed the sediment layers into the horseshoe-shaped terminal moraine arc that exists today. In the process, the Miocene layers of the subsurface, which previously lay horizontally at depth, were deformed by glacial tectonics, and tilted in the form of scales. This way, the raw material-bearing layers of alum clay, clays, lignite, and glass sand cropped out at the surface, usually in close proximity to each other. These circumstances allowed the early extraction and industrial utilisation of the various raw materials. The period from 1840 to 1970 saw the fast-paced development of industry in the Muskau Arch region based on raw materials and location.

The industrial history of the region and its special geological feature is presented for the first time in the permanent Geopark exhibition «With dirt to prosperity» in the Geopark's head office in the historic Klein Kölzig Brickworks. It was achieved with funding from the Brandenburg Ministry of Economic Affairs, Labour and Energy through the cooperation between the municipality of Neiße-Malxetal, the European Grouping for Territorial Cooperation (EGTC) Ltd., German-Polish

Geopark Muskau Arch and the Muskauer Faltenbogen Association. A particular challenge in the realisation was the design of the exhibition in the rooms of this industrial monument while at the same time preserving its structural characteristics, such as the low ceiling, large beam constructions and un-plastered brick walls. For this reason, the wall surfaces were primarily used for the presentation of the content with large-scale infographics and specifically supplemented with stand-up display cases.

Thematically, the exhibition is divided into five chapters and takes the visitor on a journey from the formation of the Muskau Arch during the ice age, through the climatic development of the Earth's recent history, to the thematic core, the historical extraction and processing of raw materials. Lignites, various clays and glass sands and the resulting products play a prominent role here. Emphasis was placed on the selection of authentic exhibits, such as briquettes, ceramics, glassware, tools, and other items and objects such as a true-to-scale geological profile were specifically produced.

The exhibition opened in March 2023 and is open for visitors from Monday to Friday from 9 a.m. to 4 p.m.

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**View of the
exhibition
area and the
historic building
structure.**

Photo by Andreas
Matthes - www.
kocmoc-exhibitions.de



NORTH PENNINES
Area of Outstanding Natural Beauty

North Pennines National Landscape and UNESCO Global Geopark, England, UK

Fellfoot Forward in the North Pennines



**Long Meg and
her Daughters
stone circle.**

The Fellfoot Forward Landscape Partnership Scheme was a four-year programme, 2020-2024, led by the North Pennines National Landscape team and funded mainly by the National Lottery Heritage Fund. It was a major project to conserve, enhance, and celebrate the natural and cultural heritage of a special part of England, in the northwest corner of the North Pennines National Landscape and UNESCO Global Geopark and reaching communities beyond the boundary.

Through widespread community support the scheme delivered 16 projects across natural and cultural heritage that engaged community, built capacity, and supported a deeper sense of place. Projects highlighted the foundations of this landscape and connected people with the rocks beneath their feet.

Schools and the wider community took part in sound art projects: listening to the stones on sound walks; playing river pebbles; and creating lithophones from the local geology. Fellfoot Radio has supported people to tune in from around the world to listen to voices, sounds and crafted pieces

**Sound
workshop with
artists Jeremy
Bradfield and
Jayne Dent.**



from across the scheme area.

Long Meg and her Daughters stone circle is a key Neolithic site and the most visible representative of this sacred prehistoric landscape. The scheme supported people to research and capture its stories and take part in archaeological digs. The Cumberland Geological Society and volunteers carried out a geological survey of the 50+ daughter stones. The final report will be the most up to date assessment of these varied volcanic glacially deposited erratic rocks. The geologists believe they have also identified the very site in the riverbed where the large sandstone monolith or Long Meg was cleaved and carried to the circle.

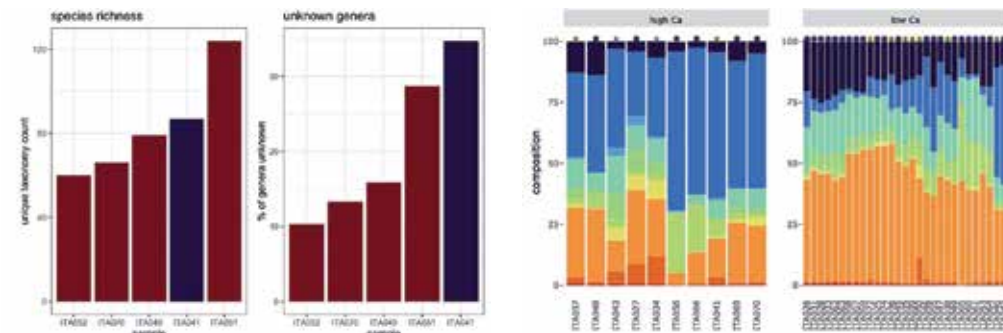
Farming at this time is in flux. Nature recovery and soil health, supporting carbon sequestration, are key drivers for change. Environment grants and a sustainability thread running through the scheme supported farmers to grow their understanding around farm carbon and its management to capture and hold carbon in the soil and pasture, and increase their use of renewable energy. This work will continue through various partnerships supporting the farming community.

The scheme worked to engage as diverse an audience as possible and to strengthen the connections within and between communities. As well as those already described, Fellfoot Forward has made a difference in many areas of sustainable development, involving elements of natural flood management, species recovery work, citizen science, development of 'slow trails' walking and cycling routes, and supporting local tourism businesses. While the scheme itself ended in April 2024, the partners and partnerships forged through it will continue to support activity in this part of the Geopark and beyond.

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Pollino UNESCO Global Geopark, Italy

Exploring nature's hidden biodiversity with Basecamp Research in Pollino Geopark



In April 2022 a team from the Basecamp Research, a company based in London (UK), in collaboration with Pollino UNESCO Global Geopark conducted a study of the microbial communities that exist in the ecosystem of the park area to discover sustainable biology-based solutions in the biotechnology sector and to promote understanding and conservation of Earth's wild places.

Basecamp Research collected 50 environmental samples (e.g. soil, water, sludge, sediment etc) from a range of different habitats from inside Pollino UGp. This allowed us to obtain a full picture of the interactions between the microbial communities of each habitat.

Sample site locations were determined by the presence of high levels of biodiversity and high habitat heterogeneity. Scientists used non-invasive methods to collect samples from the environments they visited. Approximately 100 mL of sample is collected from each sample site and is placed into a sterile, sealed plastic container to maintain good biosecurity practices. The samples are collected on foot and scientists take care to not disturb the surrounding flora and fauna.

After sample collection, the field researchers extract the DNA from microorganisms in each sample using a portable DNA laboratory. Following DNA extraction, the DNA is cleaned and concentrated to be ready for sequencing. DNA is the genetic code of life and contains instructions for building and operating an organism. Therefore, sequencing the DNA allows us to identify the information a cell needs to assemble proteins. Subsequently, this method gives us access to vast amounts of novel, fully annotated and ethically sourced protein

sequences from nature. These proteins can be used for sustainable applications in all sectors of the bioeconomy, from agriculture and nutrition to materials and pharmaceuticals. If genes, pathways, or proteins with potential industrial relevance are discovered, Basecamp Research will aim to commercialise these with collaborators in the biotechnology industry. In parallel, the samples are analyzed for sample metadata on the chemical composition, moisture content, pH, total dissolved solids, electrical conductivity & salts.

In results concerning biodiversity, one measure of biodiversity is species richness, or the abundance of unique species present in a site. Another measure is the evenness of those species' populations (is there total population dominated by one particular species, or is there a relatively even representation of all of the species present). Both higher richness and evenness are generally associated with more biodiverse environments. For example, ITA041 is highlighted as the one freshwater sample taken along with the larger number of terrestrial soil samples. This sample had a large number of unique taxa identified, and also the highest percentage of unknown genera. Unlike all of the other terrestrial samples, this sample had a significant portion of bacteria of the phyla Chloroflexi, which are frequently water-associated filamentous bacteria that are also found in high abundance in unique environments such as hot springs.

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Taking samples in the Geopark.



Taking samples in the Geopark.



Psiloritis UNESCO Global Geopark, Greece

A modern pilgrimage for the climate crisis at Idaion Andro



The Geopark's info-point with informative material, hands-on activities and story-boxes on local myths.

Photo by Androidus.

Local dancers performing at the entrance of Idaion Andro.

Photo by Androidus.



short talk on the climate crisis and natural disasters, connecting the theme of this event with the wildfires that spread across mainland Greece at this time. He also highlighted the responsibility of individuals and institutions concerning this issue. The Geopark's staff also developed two different hands-on activities for adults, aiming to raise awareness among visitors that our diet together with the production of food waste contributes to the carbon footprint (greenhouse gases) generated by our actions. The first included cubes of different weight, representing the carbon footprint of food products from localities within or far away from the Geopark (based on material already developed for educational cards produced during an earlier INTERREG project on the climate crisis, GEO-IN). The second activity included flip cards revealing the amount of water wasted and CO2 produced, through the unnecessary waste of multiple everyday food products (coffee, milk, vegetables etc.). Both activities seemed to engage the visitors and led to some interesting conversations. The highlight of the Geopark's info-point, however, were the two story-boxes concerning local myths of the area (the shepherdess of Idaion Andro cave and the beast of the nearby Mygia's Gorge) that caught the attention of young and older visitors, leading to discussions on how past communities perceived geological structures and incorporated them in the local oral tradition.

The event focused on SDG 12 (Responsible consumption and production) and SDG13 (Climate action).

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Clay figurines made by the visitors with the assistance of Kerameion Ceramics workshop.

Photo by Androidus.

Ries UNESCO Global Geopark, Germany “Making a Difference” through Geopark Ries Schools and educational programmes



The Geopark Ries brings a message of regional identity and sustainable development to young people of all ages and educational levels through Geopark Ries Schools.

Since its founding in 2004, the Geopark Ries has prioritized education and participated in continuing education for teachers. Collaboration with Augsburg University produced teaching aids for geotopes and an in-classroom learning module fulfilling the criteria for education for sustainable development for fifth-grade classes. In 2019 the Geopark Ries finalized its comprehensive concept for Geopark Ries Schools.

The Alemannenschule (primary school) in Kirchheim am Ries began the 2022-2023 schoolyear as the first Geopark Ries School. The Alemannenschule promotes the pupils' relationship to and understanding of the origin and present state of their very special home region, emphasizing sustainability and identity.

The Mönchsdeggingen Grundschule (Primary School) celebrated its Geopark Ries School status in July 2023 with a “Crater to Crater” Summer Fest featuring children's performances. Teaching pupils about their home and contributing to a sustainable future, this Geopark Ries School looks beyond the Ries Crater rim: The Summer Fest collected donations for school construction in Sanjan, Tanzania, located close to the world-famous Ngorongoro Crater, also part of the UNESCO Global Geopark Network.

In 2023 the Staatliche Wirtschaftsschule Nördlingen became the first “middle” Geopark Ries School. This business-education school has addressed Geopark-related topics for years, for example, in the subjects “Economic Geography” and “People, Environment, Technology.” Education concerning values and environmental protection are of great importance at the Wirtschaftsschule and meaningful requirements for a Geopark Ries School.

Three academic-focused Gymnasium secondary schools (grades 5-13) joined the Geopark Ries School network in 2023: Theodor-Heuss-Gymnasium in Nördlingen, Albrecht-Ernst-Gymnasium in Oettingen and Ostalb-Gymnasium in Bopfingen. Students benefit from the collaboration's holistic approach. Questions like «How did our landscape come about, and what affect does the Ries impact have on us, our lives, our economy and our future?» are considered from a variety of perspectives, inspiring more



intensive engagement with geological history and sustainability.

Additional Geopark Ries Schools will be named shortly.

Involvement in the Geopark Ries School network is also possible beyond the Geopark borders: The North Swabian 2023-2024 Gifted Programme for secondary schools offers a “Performative Excursions in the UNESCO Global Geopark Ries” course by the Theodor-Heuss-Gymnasium in Nördlingen.

The Geopark Ries continues its outreach to the next generations with Children's Info-Points, Kids' Trails with accompanying handbooks, guided tours for school groups, seating in Geotopes for outdoor classroom activities, continuing-education programmes for teachers and even in-school programmes with 3D models of Geopark Ries Geotopes.

As an educational partner, the Geopark Ries e.V. wants to bring the UNESCO Global Geopark message to young people. The networking of the UNESCO Global Geopark Ries and schools is a win-win situation for everyone.

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Kids' Trail, Adventure Geotope Lindle: Named for the impact rock Suevite and the mineral Riesite, the Geopark mascots, Suevie and Riesie, narrate the info panels on the Kids' Trails and the accompanying handbooks.



Saimaa UNESCO Global Geopark, Finland Possibilities of virtual tourism



Virtual platform start page.

© Saimaa Geopark.

Virtual tourism and especially nature tourism are growing trends in the world and nowadays more people are interested in nature and the preservation of geological heritage. Digitally combined with nature and tourism brings a lot of new things and numerous opportunities for the industry. By offering digital access to the Geopark, locals and visitors will be able to visit the Geopark from the comfort of their own homes. The development of digital tourism services is very important in order to develop a more sustainable operations model for the tourism industry.

Saimaa Geopark has developed a virtual platform that presents all the geosites in the member municipality of Saimaa Geopark, Lappeenranta. The purpose of the virtual platform is to increase the knowledge of regional nature sites, develop tourism in the region to be more versatile and inspire visitors to visit the Saimaa Geopark sites. Saimaa Geopark operates in nine municipalities and in the future the same virtual platform will be used for other municipalities as well. The virtual platform has been published on the Wonda VR and is composed of 360-degree images. The platform allows the viewer to visit the unique geosites of the Saimaa Geopark while learning about their history and geology. The platform is freely accessible to all, and the video can be viewed with or without VR glasses.

You can explore the virtual platform here: <https://wvr.li/hu0gq1>

At a time when environmental protection is increasingly important, it is vital to identify ways in which technological innovations such as virtual reality tour-



Saimaa Geopark geosite, Rakuunamäki.

© Saimaa Geopark

ism can contribute to sustainable behaviour.

Environmental protection has emerged as a key issue worldwide and is becoming increasingly important. Technological developments offer new opportunities to reduce environmental impacts and promote sustainable development. One such innovation is virtual reality travel, which allows people to experience travel without physically moving from one place to another.

Virtual Reality (VR) tourism allows users to explore different destinations and cultures virtually. This technology can reduce the need to travel by air, which in turn reduces carbon emissions and other environmental impacts. For example, instead of travelling to the other side of the world, we can experience the same experience from the comfort of our own home using VR glasses. VR travel can also provide educational opportunities and raise awareness of environmental protection.

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Saimaa Geopark geosite, Muukonsaari.

© Saimaa Geopark.



Mönchsdeggingen Primary School:The Mönchsdeggingen Primary School celebrated its status as a Geopark Ries School at the “Crater to Crater” Summer Fest featuring student performances. Donations were collected for school construction in Tanzania.

Sitia UNESCO Global Geopark, Crete, Greece

Initiatives to tackle desertification and protect agriculture from climate change



Endemic plants with a deep root system suitable for hedges
a *Olea europaea*
b *Quercus coccifera*
c *Pistacia lentiscus*
d *Ceratonia siliqua*

Eastern Crete, and especially the Geopark of Sitia, is the most exposed region to desertification in Europe due to the effects of climate change. The lack of rainfall and the increase in temperature have affected the production of agricultural products and especially the production of olive oil, with effects on the local economy and the abandonment of agricultural land with direct effects on rural ecosystems and the landscape. The project «LIFE – AgrOassis: Regenerative approaches for implementing climate change resilience in EU agricultural regions prone to desertification» was the initiative of Universities, Research Institutions of Greece and Cyprus and Sitia Geopark. The primary objective of Agroassis is to assist climate change adaptation in the agricultural sector of the EU's two most south easterly countries, Cyprus, and Greece.

To meet the objectives of the EU legislation and policy on climate action AgrOassis will develop, demonstrate and promote innovative techniques, best practices, methods and approaches, as well as close-to-market solutions in areas currently exposed to desertification. As a consequence of inappropriate land use and wildfires, these areas are expected to become even more vulnerable as a result of climate change. The project will also markedly contribute towards climate change mitigation, promote carbon farming and biodiversity restoration.

While regenerating ecosystem services within degraded agroecosystems, AgrOassis will also seek to identify and remove obstacles related to inappropriate governance and policies that obstruct the implementation of the EU's Green Deal Agenda and the aim of reaching climate neutrality by 2050.



Planting by volunteer groups.

The project is based on three main actions to support agriculture against the effects of climate change:

- 1. Soil improvement by Mulching and Minimum or No-tillage.**

No-tillage and minimum tillage farming prevents soil compaction and surface crusting, permitting plants to grow deeper roots assisting their survival during drought. This action aims at changing farmers' attitudes towards land management in Greece and Cyprus

2. Resilient Hedgerow Installation.

To achieve this goal, a nursery infrastructure for production of specialized planting tubes will be built. As a second step the production of seedlings preconditioned to drought stress will be established. The final step will be to implement planting of hedgerows in degraded wheat fields, margins and road sides connecting fields, and in burnt and/ or degraded orchard margins.

3. Sustainable Production of Compost.

One of the most important quality indicators for desertification is the low soil organic matter (SOM). Increasing the SOM in agricultural fields directly increases their water storage capacity, creates a healthy habitat for beneficial soil bacteria and other biodiversity, captures carbon and makes the soils more resilient to withstand climate change.

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Agriculturalist T.E, Municipality of Sitia



Hedge with the endemic *Cupressus sempervirens*.



Sobrarbe-Pirineos UNESCO Global Geopark, Spain

Making a difference: First Pyreneans, Geology and Archaeology in Sobrarbe



Discussion panel.

Photo by Sonia Sampietro.

The 15th Seminar of the Sobrarbe-Pirineos UNESCO Global Geopark, held from October 20 to 22, 2023, addressed the changes experienced in the Pyrenees over the last millennia, in relation to its climate, landscape, and human presence.

In an effort to contribute a novel interdisciplinary approach, scientists specialized in various areas such as geology, archaeology, palaeoclimatology, and geography were convened, leading to interesting conclusions.

Firstly, the collaboration between different disciplines was highlighted as fundamental for studying archaeological sites, allowing the simultaneous gathering of climatic and archaeological information. Although interdisciplinary boundaries may pose challenges, it was observed that in mountainous areas, where the research started from scratch, collaboration was intense from the beginning, proving beneficial for understanding archaeological phenomena.

A growing interest in fields such as geoarchaeology was noted, indicating an intensification of collaboration among geologists, geographers, his-

torians, and archaeologists over time. However, challenges persist, such as the need to improve precision in dating, especially for recent historical events. Despite achievements in dating sub-events, it was acknowledged that the imprecision in Carbon 14 dating remains a challenge.

In the context of Aragon, the lack of intensive studies in agricultural archaeology was emphasized, limiting the understanding of elements such as terraces and areas designated for agricultural and livestock activities. Furthermore, the importance of exploring open spaces, such as cultivated fields and forests, in search of archaeological traces, was emphasized.

It was concluded that past climatic changes have influenced human lifestyles, although the correlation is not always clear. The bidirectionality in the relationship between climate, vegetation, and human activity was emphasized, recognizing the human impact on the landscape and climate over time.

The speakers offered a vivid portrait of people and their communities over the last thousands of years, highlighting the adaptability and complex interactions with the environment. Ancestors were envisioned traversing glaciers, undertaking long journeys, and participating in the earliest agricultural and livestock activities.

Regarding the possibility of unifying scales and temporal nomenclatures in different disciplines, the idea of using the common temporal unit of years as a basis for unification was suggested.

In summary, this event made a difference by bringing together experts from areas that typically work in parallel, opening numerous discussions on fascinating topics, and promising future meetings that will delve into these interdisciplinary aspects.

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field trip to Labasar.

Photo by Sonia Sampietro.



Sunnhordland UNESCO Global Geopark, Norway Building Continents And Societies



Sunnhordland Geopark consists of 8 municipalities, 4700 km² and 65,000 inhabitants in the Sunnhordland region on the west coast of Norway. We were awarded UNESCO Global Geopark status in 2023.

The growth of continents is largely due to magmatism in connection with island arcs and continental arcs, and here two of the most important ancient growth zones on Earth are juxtaposed. The oldest zone was formed by continental arc magmatism, the younger by island arc magmatism and by arc-continent and continent-continent collisions. The variety of plutonic and volcanic rock complexes that outcrop in these contrasting areas show the types of rock that make up the crust. The geology of the Geopark is unusually diverse. In a small area, there is a wide range of igneous, metamorphic, and sedimentary rocks that provide an insight into the deep crustal and surface processes that build continents.

This geology is exceptionally well exposed in the spectacular and contrasting landscapes formed by glaciers. The eastern part consists of an alpine and partially glaciated terrain that is crosscut by deep fjords. Towards the west, the landscape transforms into an archipelago consisting of several thousand smaller and larger islands. A wide variety of rock types, landscapes and climates result in habitats ranging from the harsh environments of glaciated mountains and wave-washed archipelagos to rich boreonemoral rainforests. A national park includes the glacier and the surrounding mountains, and there are more than 70 nature reserves within the park.

This landscape was uncovered when the ice retreated rapidly around 12,000 years ago. The territory was then colonised by plant life and inhabited by humans. Stone Age settlements began to mine raw materials for tools, and the greenstone from this area became a valued commodity that was widely used along the Norwegian coast over a period of 5700 years. Later, numerous mines were established as the demand for building materials, industrial minerals and metals increased. Even today, the landscape contributes to building of societies. Fish farming is carried out in the archipelago, hydroelectric power stations and aluminium factories operate in the glaciated mountain regions. The sheltered deep



Map of Sunnhordland UNESCO Global Geopark.

fjords have enabled the construction of platforms for the offshore oil industry and now also for wind power generation. The diversity and quality of the exposures in the territory was recognised a hundred years ago as a gift for teaching and training. Several thousand geology students from the University of Bergen have since had their first eye-opening field experiences in the area. The area continues to be a key area for both undergraduate and postgraduate education, as well as for research in geology, archaeology, and botany.

The Sunnhordland Geopark is a Limited Liability Company owned by the Regional Council. The working capital is provided by the municipalities, the county, and the government. Day-to-day operations are run by a manager and a geologist, supported by the Regional Council. Three exhibition centres are qualified as visitor centres for the Geopark and the seven-member board represents geosciences, tourism, education, and politics, including member of parliament.

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A view of the Hardangerfjord,



Anouk-Letizia Firle, geologist and Brynjar Stautland, manager.



Luberon UNESCO Global Geopark, France MediterrRE3, an international cooperation project to reduce wildfire risk

Visit the dry grasslands maintained by grazing that form a fuel break on the eastern crest of the Luberon.
- E.Esposito Instituto OIKOS



According to scientists, regions under Mediterranean influence, including both the Luberon UNESCO Global Geopark (UGGp) and Luberon-Lure Biosphere Reserve, will experience a significant increase in the number of wildfires over the course of the 21st century. They estimate that the area burned will increase by 40 to 100%. This phenomenon is the consequence of several factors, including climate change (rising temperatures, longer dry spells in summer, etc.), inadequate environmental management and land use, and landscape simplification leading to the development of high-risk interfaces and the accumulation of combustible dry biomass.

The Mediterre3 project 2021-2023 (REducing vulnerability and REstoring the REsilience of Mediterranean landscapes to reduce fore-related greenhouse gas emissions), part of the Medforval network¹, proposes a range of preventive measures to make the landscape less vulnerable and more resilient through «fire-smart landscape management».

As a member and as a study area within the project with Prokletije and Komovi National Park (Montenegro) and Samaria National Park (Greece), the Luberon Regional Nature Park - UGGp participated, alongside the Oikos Institute (project coordinator), in a specialist working group and in multiple feedback sessions which developed guidelines for fire-smart landscape planning and management based on forest landscape restoration principles and best practices at a regional level. Cooperation between different regions was the key to identify common initiatives, innovative practices, and concrete ways for increasing the capacity to secure adequate long-term support through funding mechanisms addressing land degradation and climate change.

By way of example, maintaining extensive grazing at the top of the Luberon range is one of the pillars



Presentation of the restoration measures of Villeneuve' burnt areas. - C.Deshons ONF

of biomass management, reducing the risk of wildfire and, in turn, benefiting biodiversity, food sovereignty and sustainable economic activity. Similarly, maintaining a mosaic of high-quality agricultural environments, in Natura 2000 sites, is essential in the fight against wildfires, as it creates fuel breaks.

In parallel, The National Observatory of Athens (NOA), another partner in the project, has modelled the increase in fire-risk and total burnt area with different climate scenarios in each of the pilot territories, based on their current fire regimes (topography, exposure, soil, type of vegetation, etc.). According to the modelling, the total burnt area in the Luberon-Lure territory is set to increase by 32-111 % by 2070, hence the need to develop effective risk management.

Based on the guidelines and modelling, in each target landscape, a Landscape Working Group has been activated with the task of drafting a concerted Landscape Action Plan (LAP), applying locally fire-smart actions. The LAPs will identify the priority actions required to reduce the fire risk, main risky areas, potential sources of funding and all stakeholders to be involved.

1. Medforval network: international network of mediterranean forest landscapes of high ecological value, coordinated by the NGO Instituto Oikos (Italy)

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A set of photographs from the exhibition hall .



Vikos-Aoos UNESCO Global Geopark, Greece Rocks Under the Microscope: A Photographic Exploration of Vikos-Aoos Geopark

A rich geological history and a variety of rocks with their creation being related to the Tethys Ocean and the Alpine Orogeny characterize the Vikos-Aoos UNESCO Global Geopark (UGGp). Ophiolites found high up at Smolikas Mountain (2637 m), forming the highest area of the Geopark, were once part of the Tethyan oceanic crust. The captivating incision of the Vikos Gorge reveals the regional geological history through the consecutive strata of limestones, while the steep peaks of Tymfi Mountain reflect the last glacial period and the still active tectonics.

Rocks come in various shapes, sizes, and colours, due to the different minerals and formation processes associated with them. Peculiar patterns caused by mineral arrangements, weathering, or organic growth have long evoked the human admiration of rocks. The aesthetics of rocks extend beyond their physical appearance, encompassing stories, evoking emotions, and opening a window into the Earth's past. Mineral and rock education assists in developing a deeper appreciation for the planet and its resources, critical thinking skills and problem-solving abilities. The study of minerals and rocks under the microscope assists the geologist in unlocking their formation history, and unveils detailed aesthetic aspects to the rock enthusiast.

With these aims, the Development Agency of Epirus S.A., the managing entity of the Vikos-Aoos UGGp, organised the exhibition "The rocks of the Vikos-Aoos UNESCO Global Geopark under the microscope: Aspects of their microcosm" to showcase the regional geo-heritage. The exhibition was meticulously prepared by members of the School of Geology, Aristotle University of Thessaloniki, Greece and was held at the city of Ioannina between June 7 and 10, 2023. The exhibition attracted hundreds of visitors that had the opportunity to make a captivating journey into the geology of the Geopark and the intricate hidden world of its rocks through photographs taken under a petrographic microscope. Thirty three representative microphotographs printed in large dimensions covered the exhibition walls, while hands-on experience of characteristic samples of rocks and minerals was offered. A microscope was also available for those willing to explore the thin sections of the rocks; an activity especially attractive to the younger participants. Informational material and volunteers explained the mineral microcosm, while several maps and field photographs were



showcased, aiming to inspire and encourage the exploration of the Geopark. The exhibition provided a unique opportunity for visitors to discover the beauty and complexity of the geological world and be inspired by the natural heritage of the area. Following the successful organisation the administration of the Geopark plans to publish a special volume dedicated to the exhibition. In an effort to extend the exhibition's impact and to ensure that the educational content and the aesthetics captured in the photographs will continue to inspire and engage audiences.

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The banner of the exhibition.



The "Big Mountain" including the former waste dump (front) and the active quarry (back).

Photo by City of Halle.

TERRA.vita UNESCO Global Geopark, Germany Recreation and education on a former landfill site: The new nature and geopath "Secrets of the ('Big Mountain')"

Around the "Großer Berg" ("Big Mountain") in Halle-Künsebeck, in the southeastern part of the UNESCO Global Geopark TERRA.vita, visitors can learn how this landscape has developed over the past 145 million years, how it was and is used for waste disposal and limestone mining, and how nature is reclaiming its place.

What is special. The experiential trail crosses a waste dump, which was created in a former limestone quarry. From here, visitors have a beautiful view of an active quarry site and over the Münsterland region. They unravel the many mysteries of the "Big Mountain" at eight interactive stations on two loop trails, each approximately one-kilometre long.

The Rock View loop trail provides geological information about the Cretaceous Sea, the uplifting of the Teutoburg Forest, as well as the formation of the limestone and its rich fossil content. At a viewpoint of the giant quarry and its associated lime industry the trail explains how we humans use the geological raw material for the construction industry and agriculture.

The Nature View loop trail focuses on the former waste dump and – that might sound like a contradiction – its high value for nature. From the middle 1960s to 1999, waste from the Gütersloh region was stored here. Sealed and maintained to ensure that no polluting substances escape, the dump is covered by limestone from the adjacent quarry. The lime substrate provides an ecological habitat for species that cannot cope with over-fertilized soil. Therefore, the "Big Mountain" area is protected as a nature reserve and Special Area of Conservation.

A mascot, Amadeus the Ammonite, guides children using simple language at every site and in the field

The backpack for young researchers (left) can be borrowed as part of guided tours (centre) and contains tools for the field and a guidebook (right).

Photos by Anna Becker.



guidebook. The field guide is together with a hammer, chisel, safety goggles, and a magnifying glass part of a research backpack. School classes and individual young researchers can borrow these backpacks as part of a guided tour. Partners of TERRA.vita, the City of Halle a.T.W. and the local league IGKB, organise the service.

Despite all human influences, the "Big Mountain" waste dump and the adjacent limestone quarry strengthen the sustainable development of nature in the region (SDG 15 – Life on land). The waste dump also contributes to SDG 7 (Affordable and clean energy) because gas developing during the decomposition process is transported underground to a nearby power plant, replacing fossil gas.

For the residents of the small community of Künsebeck, the re-accessibility of the area and the creation of the experiential trail benefits local recreation and contributes to SDG 3 (Good health and well-being). It also contributes to sustainable tourism and supports SDG 11 (Sustainable cities and communities). The mining of the limestone for the concrete industry can be criticized, because it contributes negatively to the community's CO2 footprint. However, the lime works fulfill local needs, prohibit the transport of fossil resources from abroad, and as a well-trusted local employer contributes to SDG 8 (Decent work and economic growth).

Finally yet importantly, the nature and geopath "Secrets of the "Big Mountain" imparts knowledge in many ways and thereby contributes to SDG 4 (Quality education).

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The view of the active quarry site at the Rock View loop trail.

Photo by Anna Becker.

Ore of the Alps UNESCO Global Geopark, Austria

The power of networking – making a difference



This article intends to show the importance of networking between the individual geoparks using the Ore of the Alps UGGp as an example. At the beginning of June 2023 together with our partner geoparks in Germany, Inselberg - Drei Gleichen in Thuringia and Porphyrland in Saxony, we celebrated 10 years of the Ore of the Alps Geopark and 12 years of partnership. This partnership contributed significantly to the Ore of the Alps Geopark and Inselsberg - Drei Gleichen Geopark achieving membership of the European Geoparks Network, and Geopark Porphyry Land's recognition as a National German Geopark.

The representatives of the three geoparks met for the first time in 2011 at the Geotope Conference in what is now the Ries UGGp. There they got to know each other with the aim of jointly raising their geoparks to a higher level - i.e. by becoming members of the European and Global Geoparks Networks. In the same year, a cooperation agreement was signed between the geoparks and the corresponding LEADER regions. Since the three geoparks are located in LEADER regions they were able to apply for funding from the transnational LEADER funding programme. In the same year, the first co-operation meeting was held in Bischofshofen, in the Ore of the Alps Geopark. The first projects were discussed, which were gradually implemented over the following years.

The Ore of the Alps Geopark was able to receive funding for the complete upgrading of the Geopark, including the application for inclusion in the European and Global Geopark Networks. The Porphyryland Geopark was able to use the funding to realise its first geoportals, while the Inselsberg - Drei Gleichen Geopark was also able to implement projects such as the installation of information trails.

The first success was achieved when the Ore of the Alps Geopark was accepted into the European and Global Geopark Networks in 2014 and the Geopark Porphyryland was accepted into the German National Geopark Network. In the years that followed, a number of joint projects were realised, particularly in geotourism, as well as cooperation at university level. This was one of the reasons why the Inselsberg - Drei Gleichen Geopark achieved membership of the UNESCO Global Geoparks. Unfortunately, owing to reduced levels of cooperation during the coronavirus crisis, the European Copper Road, a major joint project, was not realised. However, it is now possible to meet physically to discuss and develop projects at the round table. The 2023 exchange meetings were all about 'Projects for the future'. The joint geopark ranger training programme, the establishment of a joint Geopark Education Academy and the manifestation of the 'Feel the History' concept in the three geoparks were the focus of discussion. The cooperation paper signed by all partners and LEADER offices allows us to look to the future together in order to continue with our successful collaboration.



First co-operation meeting 2011 in Bischofshofen, visiting the mining museum of Mühlbach.

© Horst Ibetsberger.



Co-operation meeting 2017 in Bischofshofen, in front of the Visitor Centre and the ski jump.

© Horst Ibetsberger.

fortunately, owing to reduced levels of cooperation during the coronavirus crisis, the European Copper Road, a major joint project, was not realised. However, it is now possible to meet physically to discuss and develop projects at the round table. The 2023 exchange meetings were all about 'Projects for the future'. The joint geopark ranger training programme, the establishment of a joint Geopark Education Academy and the manifestation of the 'Feel the History' concept in the three geoparks were the focus of discussion. The cooperation paper signed by all partners and LEADER offices allows us to look to the future together in order to continue with our successful collaboration.

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Co-operation meeting 2023 in Bischofshofen. Discussion of the topics for future projects.

© Horst Ibetsberger.



Trollfjell UNESCO Global Geopark, Norway

Trollfjell sustainability day – beach clean-up

Fig. 2: Around 200 pupils collected 2,5 tons of marine litter during the sustainability day. Findings included bottles from Germany and Great Britain, car tyres, a signpost from Ireland (house for sale), a plastic box from China, a can with formic acid and toothbrush.

Photo by Julie Slapo Moe, Brønnøysund high school.



During autumn 2023, a new sustainable concept was carried out in the territory of Trollfjell UNESCO Global Geopark. In collaboration with two high schools, the Geopark put marine pollution on the agenda by organising and implementing a sustainability day filled with activities to raise knowledge and attitude.

The Geopark's extensive coastline with thousands of islands and islets is naturally affected by the increased amount of marine litter, which has negative consequences for the marine environment. In the light of the UN Decade of Ocean Science for Sustainable Development, we wanted to engage local youths in this issue with a beach clean-up operation involving hands and minds, with a wider perspective on sustainability.

Two hundred pupils were involved on this day in



Students returning from the islands with litter that will be put in a container and transported to the recycling station.

Photo by Kamilla Pedersen, Trollfjell UGGp.



In Norway, the fishing and aquaculture industry and consumers are the most important sources of marine litter. Most of it originates from Norway. In addition, large amounts of plastic waste are transported by ocean currents from northern European countries and sea areas, particularly from the North Sea and the Baltic Sea.

Photo by Gjøran Engen, Brønnøysund high school.

September, kicking off with a sustainable school breakfast made from expired food donated by local grocery stores. The topic of food resources and waste was discussed in the context of SDG 12 (Responsible consumption and production). Moving on to SDG 14 (Life below water), the magnitude and impacts of ocean plastic pollution were discussed before the pupils mobilized to the clean-up action; beach clean-ups are one of the most important measures against marine litter.

As the clean-up operation took place out on the islands, we collaborated with different organisations to transport the pupils by boat including the local fire service, Campus BLÅ high school, and in "The Same Boat beach clean-up organisation", landowners and other locals all volunteered boat transport facilities. Alongside the litter clean-up, the pupils had to record the weight and type of litter as well as trying to determine its origin and age. In order to motivate and strengthen the pupils' relationships, we included a competition between the school classes. The best class picture and the best collaborative effort were awarded with sustainable prizes – teambuilding activities sourced from local suppliers.

Back at school, the clean-up findings were summarized by the pupils including making presentations to share the newly acquired knowledge with each other. The overall feedback on the sustainability day from the pupils and other people involved was great, and Brønnøysund high school used it not only to highlight curricula but also as a method to strengthen the social environment at school.

This clean-up operation is one of many operations carried out as part of a 2-year marine pollution project owned by Trollfjell UGGp. The project is funded by The Norwegian Centre against Marine Litter, a government agency under the Norwegian Ministry of Climate and Environment.

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UNESCO GLOBAL GEOPARKS

6th October
**INTERNATIONAL
GEODIVERSITY
DAY**

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