

EARTH SCIENCES

Building capacity in the Earth Sciences for the sound management of our planet's geological diversity in the service of society

INTERNATIONAL COOPERATION FOR RESEARCH, MONITORING, EDUCATION AND CAPACITY BUILDING IN THE EARTH SCIENCES TO BUILD A SUSTAINABLE FUTURE

UNESCO is the only United Nations Organization which deals with interdisciplinary research, training, education, and capacity-building in geology and geophysics through its programmes in the Earth sciences. This long-term UNESCO involvement in the solid Earth sciences reflects the importance of geological knowledge for sustainable development, especially for countries in transition and developing countries. Knowledge of the Earth's geodiversity and how to manage it in an environmentally sound way contributes to raising people's living standards. The Earth system determines conditions for the basis for human survival from biodiversity to a habitable climate to the provision of drinking water.

Geological knowledge allows us to identify mineral and energy resources. Changes in the Earth's climate, and the development of life on Earth, are preserved in the rock record. These past environmental changes shed light on present and future environmental challenges. The Earth's surface, including our habitable environment, is a product of, and is controlled by, deep Earth processes. Throughout history, the development of our society has been intimately linked to the natural history and the resources of our planet. Stone, bronze, iron, gold, coal and oil are but a few of a long list of geological resources that have helped shape our society, leading to the industrial revolution. The new 'silicon age' would not have been possible without geological research and its multiple applications to new technologies.

The Earth sciences not only contribute to overcoming major challenges posed by the geological surface and sub-surface conditions with respect to human development projects such as construction, road-building, tunnels, management of water and energy supplies, waste disposal, but also inform on major threats such as geohazards and climate change. This leads to improved cost effectiveness, and helps mitigate the effects of natural geological hazards, thus saving lives. Global knowledge of the Earth sciences is increasingly needed, and UNESCO plays an important role in connecting a variety of partners in the Earth sciences with decision-making communities to plan for sustainable development of the Earth and its resources.



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MAIN PROGRAMMES AND ACTIVITIES

1. International Geoscience Programme (IGCP)

With around 30 sponsored research and capacity-building cooperation projects annually, IGCP promotes interaction and networking between geoscientists and environmental and social scientists in solving fundamental geoscientific problems relevant to sustainable development. The IGCP, a partnership with the International Union of Geological Sciences, focuses on the societal importance for the sustainable use of mineral and hydrocarbon resources, the mitigation of hazards of geological origin, the study of the water cycle and the Earth's interior plus global change and the evolution of life.

2. Global Geoparks Network (GGN)

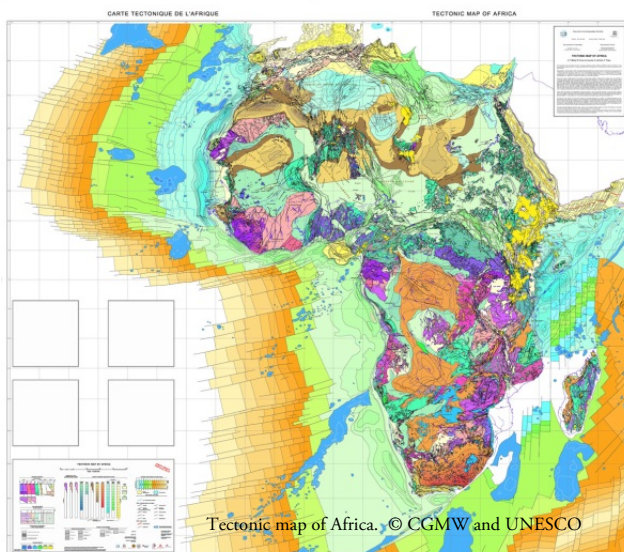
Through the Global Geoparks Network, internationally important geological sites (100 in 30 countries as of 2013) gain worldwide recognition and benefit through the exchange of knowledge for the protection and promotion of geological heritage. Global Geoparks promote awareness of geological hazards, many helping local communities prepare disaster mitigation strategies. They are educators on climate change and adopt a best practise approach to utilising renewable energy and employing the best standards of "green tourism." Global Geoparks empower local communities and help reconnect human society at all levels to the planet we call home and to celebrate how the Earth, and its 4,600 million year long history, has shaped every aspect of our lives and of our societies.

3. UNESCO's Earth Science Education Initiative in Africa

The Earth Science Education Initiative in Africa aims to support the development of the next generation of Earth scientists in Africa by equipping them with the necessary training, tools, networks and perspectives to apply sound geoscience in facing the challenges of, and benefiting from, the opportunities of sustainable development. Benefits and opportunities include traditional mineral extraction and environmental management such as climate change adaptation, prevention of natural hazards, and ensuring access to quality drinking water. Activities focus on the African Network of Earth Science Institutions which is building a community of experts and resources, training in geological mapping, and improving school-level education in the Earth sciences.

4. World, regional and continental geological maps

Through its support of the Commission of the Geological Map of the World (CGMW), UNESCO encourages the preparation of geological and Earth resources maps of regions and continents to facilitate the sustainable development of our planet's resources and human settlements. UNESCO cooperates, as an advisor, with geological surveys worldwide in the OneGeology project to provide geological data for the Earth.



EXAMPLES ON THE GROUND

International Centre on Karst Research, China

The International Centre on Karst Research in Guilin, China at the Institute of Karst Geology, established in 2008, constitutes the only international centre on interdisciplinary research on karst in the UN system. It is a direct follow-up to the success of more than 15 years of cooperation of three IGCP projects. Karst areas are very fragile landscapes underlain by limestone eroded by dissolution producing ridges, towers, fissures, sinkholes, and other characteristic landforms that need careful management to sustain local economies. Karst is found over vast areas of the world; forty countries and one billion people are affected by karst formation. www.irck.edu.cn

International Centre on Space Technologies for Natural and Cultural Heritage (HIST), China

HIST was established in Beijing, China in 2011 to assist UNESCO's programmes and Member States that desire to receive such assistance on the use of applied space technologies for UNESCO's activities related to both natural and cultural world heritage sites, biosphere reserves, Global Geoparks, sustainable development, education, climate change and natural disasters. It will also contribute to facilitating and increasing technical cooperation amongst developing countries.

<http://www.unesco-hist.org/cn-us/>

Geoparks and Women

Global Geoparks contribute to empowering women through education programmes and through the development of women's cooperatives. In the Lesvos Petrified Forest Global Geopark, Greece, the women's cooperatives help women to ensure their own income by providing tourist accommodation and selling products produced in the Geopark, a major contribution to local development. The Lesvos Global Geopark collaborates closely with these cooperatives and local organic food producers to offer visitors the opportunity to taste and buy local food products such as pasta, organic olive oil, wine, ouzo, liquors, traditional sweets and marmalade. Visitors experience not only the geodiversity and rich natural heritage of the area but also the culture, tradition, and local production of the region.

<http://www.petrifiedforest.gr>

IGCP Projects 493 and 587

Some 600 million years ago, one of the most significant events in the Earth's history occurred – a sudden increase in biodiversity, resulting in a variety of hard skeletons in the geological record. The IGCP projects on the Rise and Fall of the Vendian Biota are particularly interested in the precise timing of these events and the effects that changing environments, climates, chemistry and palaeogeography had on the development and diversification of animals, culminating in the spectacular Ediacaran/Vendian faunas. Researchers from many disciplines investigate sections along the coasts of the White Sea in Russia, the Flinders Range of South Australia, the deserts of southern Namibia and the coastal outcrops of Newfoundland. These IGCP projects are particularly active in public outreach including students and non-scientists as well as artists. Initiatives include a postage stamp and accompanying teachers' kit, a joint children's publication with Australia Post, symposia, classroom lessons for the general public, jewelry depicting Ediacarans and a CD of music in memory of Ediacarans.

www.geosci.monash.edu.au/precsite

Global Earth Observation Section
Division of Ecological and Earth Sciences
Natural Sciences Sector
UNESCO - 1, rue Miollis
75732 Paris Cedex 15 – France
www.unesco.org/new/en/natural-sciences/environment/earth-sciences/