GEO-GNOME: the GEO Global Network for Observations and information in Mountain Environments

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Why mountains?
Water towers

Ecosystem services and biodiversity

Cultural heritage

Food
Mountains host more than 10% of the world population

Mountain environments are linked to downstream regions and provide essential resources and services to the surrounding downstream societies and ultimately to the global community.

1992 - *Rio de Janeiro Earth Summit, Chapter 13 of Agenda 21* confirmed the need for sustainable development in mountain regions, given mountains’ crucial role as sources of water, energy, biodiversity, minerals, forest products and agricultural products.

2001 - International programs of **FAO** (focus on mountains) and **IGBP** (Report 49)

2002 - **Declaration of the International Year of Mountains by the United Nations**

2002 - **Johannesburg World Summit on Sustainable Development**, underlines that specific actions to be taken for the preservation and sustainable development of mountain regions

2008 - Mountain ecosystems were identified in 2008 report **of the General Assembly of the United Nations** (UN, A/Res/62/196, 2008) as key indicators of such effects of climate change, especially in terms of vulnerable resources like biodiversity and water.
Mountain regions are highly sensitive to climate and environmental change (including water and air pollution, changes in land use, alien species): Ecosystem functions and services Water quality and quantity Food production Economic growth

It is essential to monitor the mountain environment and estimate its response to future climate conditions
Uncertainties in precipitation estimates: the case of HKKH

Palazzi, von Hardenberg, Provenzale, JGR 2013
And for future projections it is even worse: precipitation from CMIP5 models

Palazzi, von Hardenberg, Provenzale, *sub judice*
We need to invest in application-driven research (water and ecosystem services, societal benefits)

Significant progress can be achieved by

Open data
Open models
Open information
Open mind
We need global cooperative actions

Best use of existing data (EO, ground)

Expand monitoring and measurement networks to answer specific questions

Develop models specifically suited for the mountain environment
There are several international initiatives on mountains:

- GLORIA
- ICIMOD
- Belmont Forum
- European Climate Research Alliance
- Mountain Research Initiative
- Mountain Partnership
- Alpine and Carpathian Conventions
- LTER – mountains
- FP7 – H2020 Projects
- National projects with international study areas
The GEO Global Network for Observations and information in Mountain Environments. Starting as the C3 component of EC-01

Supports the GEO Strategic Targets:

- Biodiversity
- Climate
- Disasters
- Ecosystems
- Water
- Weather
GEO-GNOME will

• Capitalize on previous achieved results and outcomes, and it will create a comprehensive partnership of key stakeholders and network of existing measurement and observation systems in the mountain areas, collecting the data and information; and making them available through the GEOSS portals.

• Stimulate new measurements and observational campaigns in mountain areas, with special emphasis on sensitive areas and UNESCO designated Biosphere Reserves, Natural Heritage Sites and internationally relevant protected areas.
GEO-GNOME will

• Make best use of Earth observations and remote sensing data, which can display critical aspects of mountain areas with complex topography and high elevations.

• Develop capacity-building strategies and concrete activities in mountain monitoring and sustainable development, through the provision of on-site courses and training exercises with a particular focus on developing countries with fragile mountainous ecosystems.

• Identify potential Supersites and Natural Laboratories and start operational activities in the selected areas.
GEO-GNOME will also
• Provide the Earth observations necessary to support implementation and monitoring of international conventions and agreements as well as regional mountain arrangements and agreements such as the Alpine and Carpathian Conventions.

• Create highly visible and valuable outputs to stimulate interaction between researchers, stakeholders and policy makers to identify the key environmental in each mountain area and trigger relevant needed action on the various levels (global, regional etc).

If approved, GEO-GNOME will start its activities immediately and will have its first international workshop in summer 2014.
Practical actions:

- Identify and collect data, archives and portals which are already available (eg ICIMOD, Pyrenees Climate Change Observatory, NextData project)

- Identify main scientific and applied issues to be addressed, also stimulating new measurements

- Suggest and support concrete policy actions by the interaction between scientists, stakeholders, local authorities and policy makers

- Develop capacity building strategies, especially in the most remote mountain areas.
Thanks for your attention!

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