

Recognising the need to improve our understanding of the Earth system and enhance our ability for informed decision making for the benefit of our planet and the sustainability of our societies, over 130 governments and leading international organisations are participating in the Group on Earth Observations, or GEO, to coordinate the construction of a Global Earth Observation System of Systems (GEOSS) by the year 2015.

This series of brochures provides a snapshot of the process developed by the GEO to build the GEOSS taking advantage of the international framework of cooperation and of the common vision to share and integrate information with a view to serving nine Societal Benefit Areas.

Examples of contributions from European and the European Commission-funded projects benefiting to the specific societal area or to the GEOSS building blocks are presented in each thematic brochure

GEOSS for Disasters
GEOSS for Health
GEOSS for Energy
GEOSS for Climate
GEOSS for Water
GEOSS for Weather
GEOSS for Ecosystems
GEOSS for Agriculture
GEOSS for Biodiversity

Architecture and Data Management within GEO
Capacity Building within GEO
Science and Technology within GEO
User Engagement within GEO

http://ec.europa.eu/research/environment/index_en.cfm?pg=earth



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Capacity Building within GEO

The Group on Earth Observations Capacity Building

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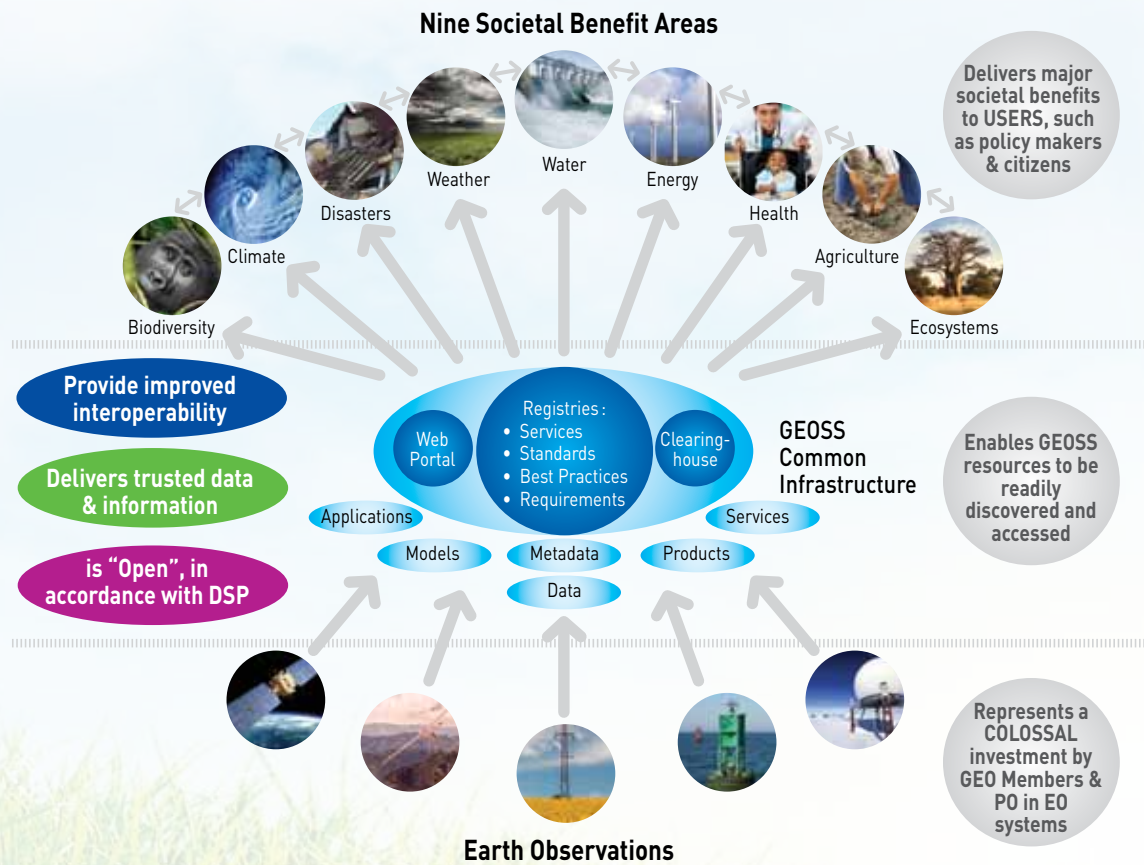
Capacity Building within GEO



GEOS - A GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS

The Group on Earth Observations (GEO) is coordinating efforts to build a Global Earth Observation System of Systems (GEOS). GEO was established in February 2005 by the Third Earth Observation Summit in Brussels in response to calls for action by the 2002 World Summit on Sustainable Development and the Group of Eight (G8) leading industrialised countries. GEO is a voluntary partnership of governments and international organisations. It provides a framework within which these partners can develop new projects and coordinate their strategies and investments.

www.earthobservations.org.



The vision for GEOS is to realise a future wherein decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations and information. GEOS will work with and build upon existing national, regional, and global systems to provide comprehensive, coordinated Earth observations from thousands of instruments worldwide and to transform the data they collect into vital information for society.



GEOS will simultaneously address nine Societal Benefit Areas (SBA) of critical importance to people and society. It aims to empower the international community to protect itself against natural and human-induced **disasters**, understand the environmental sources of **health** hazards, manage **energy** resources, respond to **climate** change and its impacts, safeguard **water** resources, improve **weather** forecasts, manage ecosystems, promote sustainable **agriculture** and conserve **biodiversity**. GEOS coordinates a multitude of complex and interrelated issues simultaneously.

This **cross-cutting approach** avoids unnecessary duplication, encourages synergies between systems and ensures substantial economic, societal and environmental benefits.

Many efforts are oriented towards **solving the standardisation of data and interoperability issues** within GEO.

GEO is also **building on its Data Sharing Principles (DSP)** agreed by its members to develop a consistent data sharing implementation plan at international level.

THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS



Target 2015

The GEOSS Strategic Target for Capacity building is the following :

Before 2015, GEO aims to :

Enhance the coordination of efforts to strengthen individual, institutional and infrastructure capacities, particularly in developing countries, to produce and use Earth observations and derived information products.

This will be demonstrated by :

- Networking activities that specifically build individual, institutional and infrastructure capacity.
- Leveraging resources for Earth observation capacity building efforts.
- Uptake Increased use of Earth observation in policy and decision making.
- Enhanced participation of developing countries in GEO and GEOSS.



CAPACITY BUILDING WITHIN GEO

GEO Work Programme relating to Capacity Building

In the current GEO Work-Plan 2009-2011, these are the tasks addressing Capacity building within GEO :

CB-09-01 Resource (or Seville Roadmap) Mobilisation

Implement the Seville Roadmap on Resource Mobilisation. The road map aims to mobilise resources for building the capacity of the three key contributors to Earth observations: individuals, institutions and infrastructure. It also works to strengthen links between the user and donor communities.

CB-09-02 Building Individual Capacity in Earth Observations

Identify education and training opportunities across GEOSS societal benefit areas. Develop synergies, encourage cross-fertilisation and address common challenges.

CB-09-03 Building Institutional Capacity to Use Earth Observations

Coordinate, strengthen and sustain existing capacity building networks within Earth observation communities. As appropriate facilitate the construction of new networks.

CB-09-04 Capacity Building Needs and Gap Assessment

Engage the user community in identifying their capacity building needs for accessing, using and producing Earth observations for societal benefit. Develop an operational capacity building presence within the GEOSS Common Infrastructure.

CB-09-05 Infrastructure Development and Technology Transfer for Information Access

Identify hardware, software and other technology required to access, use and develop Earth observation data, information and products for decision making. Promote technology transfer (in its very broadest sense), and advance infrastructure and information sharing.

CB-10-01 Building Capacity through Outreach and Awareness Raising

Show the benefits of the use of Earth observations, through the identification and dissemination of success stories in language that can be understood by all, specifically targeted at decision/policy makers applying Earth observations. The aim is to promote the application of Earth observations into their regular operations.



Examples of the European Projects contributing to the GEO Capacity Building



AMESD, or African Monitoring of the Environment for Sustainable Development, is a project funded by the European Union (EU) and coordinated by the African Union Council AUC). It is a continental wide, pan-African project for the **development of geo-information services to improve decision making-processes in the fields of environmental resource and environmental risk management in Africa**. To allow "Informed decision" AMESD works at increasing the information management capacity of African regional and national institutions mandated for environment related sectors,

and at facilitating access to Africa-wide environmental information derived from EO technologies. The AMESD Programme is, with the deployment of about 50 AMESD stations, the development of services ("Themas") and a Capacity building component, the Follow-Up of the PUMA Project which itself deployed 55 PUMA stations in 46 African National Meteo Services. AMESD may be seen as a "building Block" for GMES Africa and it is a key African contribution to GEO. (www.amesd.org).



July 2010 Kick off workshop of the AMESD IGAD thema on land degradation and desertification mitigation, and natural habitat conservation, in the region of the Intergovernmental Authority on Development (IGAD), implemented under the leadership of the IGAD Climate Prediction and Applications Centre (ICPAC), in Nairobi, Kenya.



Ambosemi National Park with Kilimanjaro.



DevCoCast builds on existing, added value environmental data sets from various sources in Africa, South America, and Europe to **disseminate in a reliable and timely way, over 50 Earth Observation data and derived**

environmental information products to a broad user community in developing countries by using and extending the GEONETCast infrastructure. The project has extended the GEONETCast network by installing 7 new receiving stations in Africa and 6 in Latin America, and will install one CMACast receiving station in China. In addition, infrastructure for central data gathering nodes (hubs), one for land applications data and one for ocean have been established. **A strong focus is put on capacity building, user support and putting GEONETCast to everyday use**. This is for instance achieved through several international training workshops, and by integrating GEONETCast in existing research, environmental monitoring systems and decision making processes, aiming to improve sustainable development. (www.devcoCast.eu).



Installing a Receiving station at the Centre for Surveying and Assessment of Agriculture and Natural resources (CREAN) in Argentina.



EUMETCast station in Niamey, Niger.



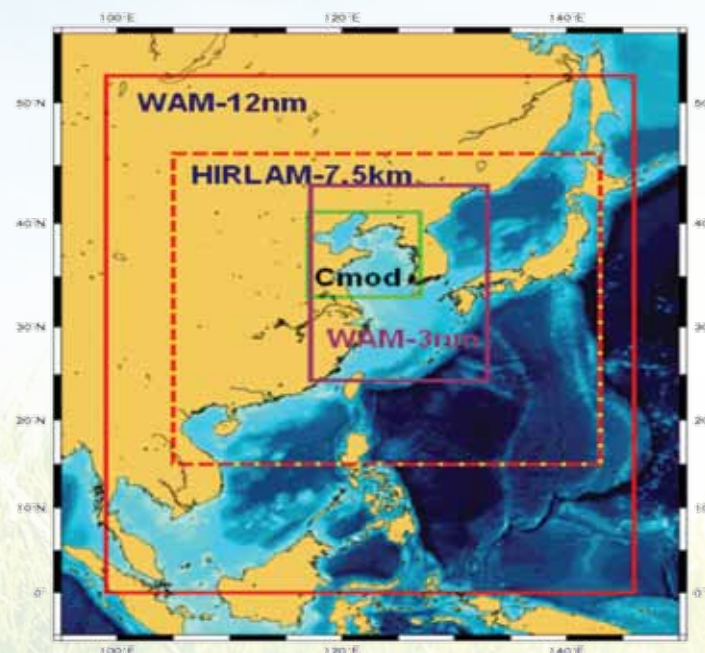
TENATSO, Tropic Eastern North Atlantic Time Series Observatory, is an FP6 project which supported pre-operational atmosphere and ocean observation capability in the tropical Eastern North Atlantic Ocean, specifically at Cape Verde Islands (16°N, 24°W). The entire region, as is the case for many tropical areas, is data poor but plays a key role in air-sea interaction. The Observatory provides unique information linking biological productivity and atmospheric composition. The location is critical for climate and greenhouse gas studies and for investigating dust impacts on marine ecosystems. (<http://tenatso.ifm-geomar.de>).



Atmospheric Station at São Vicente Island, Cape Verde. Each container is a specialised laboratory for different atmospheric measurements.



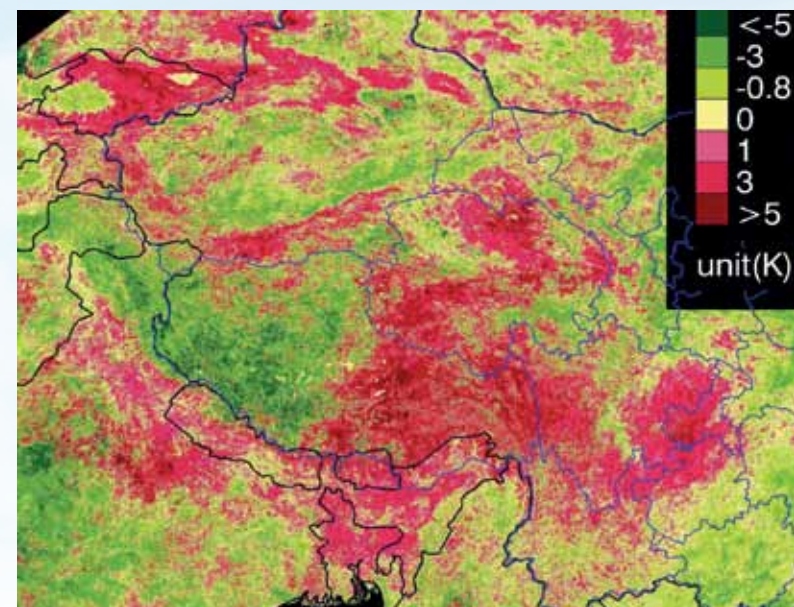
The aim of the **FP6 YEOS project** is to show a successful example of **GEOSS cooperation between EU, China and S. Korea**. There are 3 objectives. The first is to demonstrate the value of operational ocean forecasting and information service by establishing and operating such a system for the Yellow Sea. This was demonstrated for the sailing competition during the Beijing 2008 Olympic Games. The second is to share scientific advances in ocean modelling and data assimilation between China, S. Korea and the EU. The third objective is to improve cooperation between the Yellow Sea and Baltic OOSs (Operational Oceanography Systems). (<http://ocean.dmi.dk/yeos>).



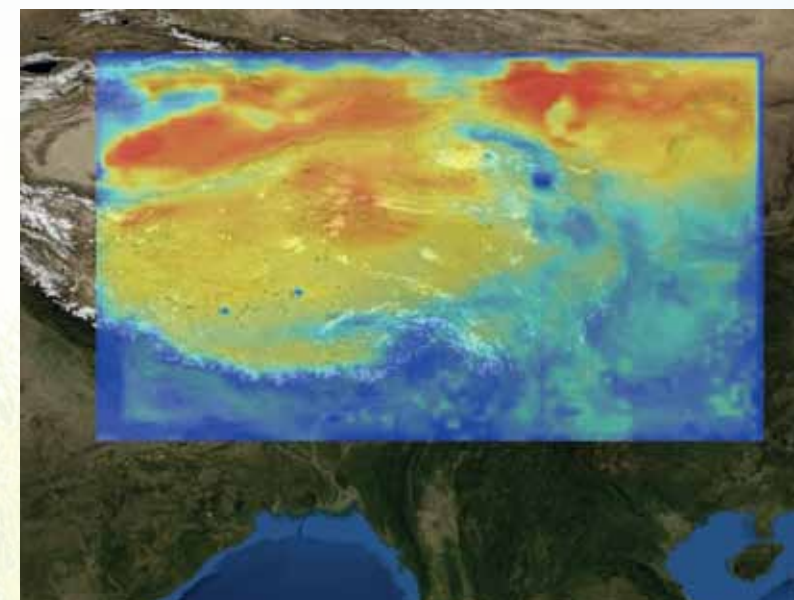
Asia weather-ocean-wave forecasting system, built up through EU FP6 project YEOS.



Human life and the entire ecosystem of South East Asia depend upon the monsoon climate, its link to land-surface hydrology and its predictability. The headwaters areas of the Yellow River, the Yangtze, Mekong, Salween, Irrawaddy, Brahmaputra and Ganges are located in the Tibetan plateau. **CEOP-AEGIS aims to construct an observing system to determine how much water is going into the seven major rivers of S.E. Asia and to monitor snow, vegetation and surface fluxes as a precursor of intense precipitation and improve forecasts of extreme precipitation in S.E. Asia.** The time-series of image data will be used to demonstrate an early-warning system for drought and floods. The project has mobilized about 100 PhD students and an even larger number of MSc students. (www.ceop-aegis.org).



Anomaly in land surface temperature during the week of 21-28 August 2006.



Atmospheric Boundary Layer height simulation with the GRAPES Model, July 16th 2008 04:08 UTC.



The **African-European Georesource Observation System (AEGOS)** will be capable of hosting and providing access to Africa's **underground natural resources information**, including mineral resources, building materials, groundwater and geothermal energy. It will strengthen the capacity of African countries to promote and develop the use of its valuable georesources in

an environment-friendly and sustainable manner with a view to meeting the Millennium Development Goals. **AEGOS is the pan-African spatial data infrastructure of public, interoperable geology-related data as well as user-oriented products and services.** This observation system will provide support to a wide range of end-users: policy-makers at all geographic levels, development agencies, private sector actors, educational and research geoscientific communities as well as civil society. (www.aegos-project.org).



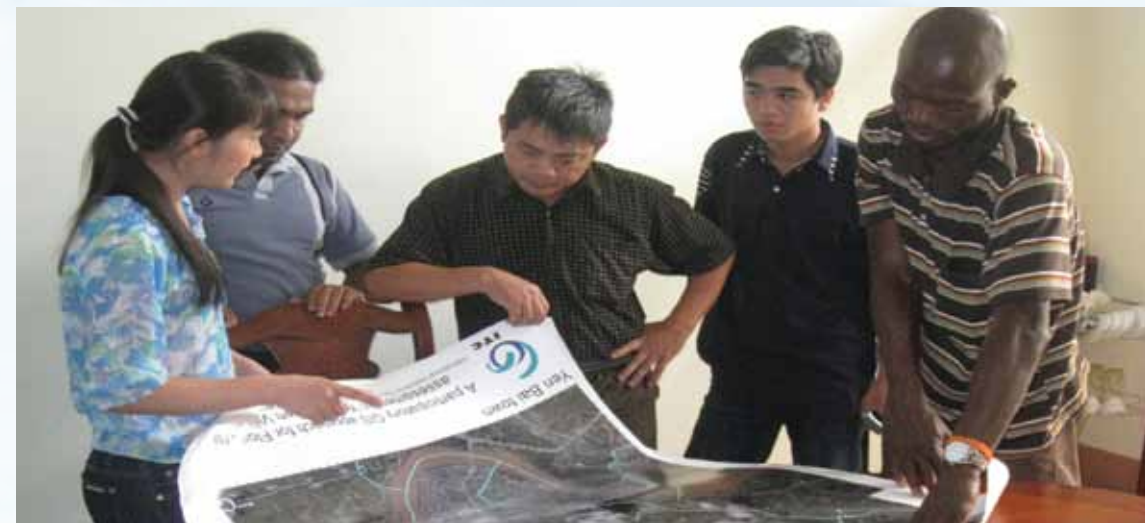
The Black Sea hydrological catchment is a case study to test the capacity of integrating large datasets to assess vulnerability and sustainability issues related to freshwater resources at various scales. The Black Sea region is internationally known for its ecologically unsustainable development and inadequate resource management which have led to several environmental, social and economic problems. **EnviroGRIDS aims to assemble an observation system of the Black Sea catchment** that will address several GEO Societal Benefit Areas. This system will

incorporate a shared information system that operates on the boundary of scientific/technical partners, stakeholders and the public. **It will contain an early warning system able to inform decision-makers and the public about risks to human health, biodiversity and ecosystem integrity, agriculture production or energy supply** caused by climatic, demographic and land cover changes with a 50-year time horizon. (www.envirogrids.net).



The purpose of the **GEO Network for Capacity Building (GEONETCAB)** project is to create the conditions to reinforce **GEO capacity building activities with particular emphasis on developing countries and new EU member/neighboring countries.** The activities aim at the establishment of sustainable brokerage for earth observation products and services and

capacity building initiatives to make sure that these resources are being used. In addition, GEONETCAB will establish an online accessible database of technical expertise for education and training in earth observation and also provide monitoring and evaluation mechanisms for GEO capacity building. (www.itc.nl/Pub/services/Major-projects/GEONetCab.html).



The purpose of the **SEOCA project is to further strengthen cooperation between Europe and the countries of Central Asia in Earth Observation.** This will be achieved by implementing

a coherent set of activities aimed at building GEO related capacity in the EO domain in the target countries and addressing different kinds of development related concerns (environmental, economic, societal etc). National needs and capacities will be collected from the stakeholders, and GEO Capacity building roadmaps will be devised. These will include the set up of national GEO offices and of a pilot regional GEONetCast network.

As a result the consortium expects that SEOCA will radically increase acceptance of GEOSS technologies by regional governments for national environmental services, meteorology, natural hazards prevention, geological explorations, etc. (www.geo-seoca.net).





The aim of the OBSERVE project is to collect and compile all the necessary information for producing an integrated analysis of the current status of EO activities and networks in the Balkans. This includes environmental monitoring, the potential benefit from the full exploitation of an integrated capacity building strategy and the prospect of creating a relevant permanent EO Community in the broader region. **The OBSERVE project ultimately aims to raise**

awareness on the importance of a mutual and enhanced EO application network on environmental monitoring in accordance with the GEO principles and to establish firm links with regional decision making bodies. This project should start in 2010 and will work in cooperation with the BalkanGEONet project.



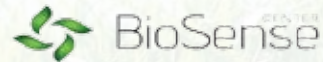
Rijeka Crnojevica (Town of River of Crnojevici). Located near Skadar Lake, Montenegro.



The **BalkanGEONet project aims at identifying existing EO-data providers and users in the wider Balkan region, to determine their status, potential and needs, and to coordinate EO players by establishing interfaces and networking between them.** A broad analysis of the gaps and complementarities of EO activities within the region will be performed, with emphasis on user needs in the Balkan region.

The consortium has been carefully constituted to include key players both from EO-data provider and EO-data user communities, from all Balkan countries. Participants from other EU countries are also included to facilitate straightforward identification of mechanisms for leveraging, developing and coordinating EO capacity building initiatives in the region.

The main outcome of the Project will be the creation of a permanent web-based networking facility, and the design of roadmaps and recommendations for an active, coordinated and sustained participation of all Balkan countries in global EO initiatives. This project should start in 2010 and it will work closely with OBSERVE. (www.BalkanGEO.net).



Wireless Sensor Networks - emerging technology for in-situ Earth observation

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