

INTER-COMMISSION / INTER-PROGRAMME ACTIVITIES

CAS/GEO Joint Activities

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Purpose of Document and Major Decision(s) Requested

This document provides an update on the development of GEO and the GEOSS and summarises the involvement of the CAS in GEO activities.

Summary of Activity

Development of the GEO Work Plan 2009-2011

The annually updated GEO Work Plan provides the agreed framework for implementing the GEOSS 10-Year Implementation Plan (2005-2015). It consists of a set of practical Tasks that are contributed to GEO by various Members and Participating Organizations including the WMO. As GEOSS takes shape over the next several years, connections will be realized between diverse observing, processing, data-assimilation, modeling, and information-dissemination systems. This should make it possible to obtain a dramatically increased range of data sets, products and services on the key aspects of the Earth system.

To achieve this, the 2009-2011 Work Plan differs from its 2007-2009 predecessor in three main ways:

- it groups Tasks into two thematic parts;
- it consolidates GEO activities developed in the first years of GEOSS implementation under a smaller number of overarching Tasks;
- it enhances the role of users and Communities of Practice – taking full account of the IGOS transition into GEO.

Finally it features “spider diagrams” to illustrate and emphasize how each Task contributes to the Societal Benefit Areas (SBAs) of GEOSS.

The 2009-2011 Work Plan has been structured into two major parts to offer a clearer overview of GEO activities. Part I, “A Transverse GEOSS”, highlights how the fundamental, cross-cutting components of GEOSS, such as the GEOSS Common Infrastructure, are being built. Part II, “The nine GEOSS Societal Benefit Areas”, describes the services and end-to-end systems that will support decision-making in each of the societal benefit areas.

The 2009-2011 Work Plan seeks to emphasize the added value that GEO brings to Earth observation. It does this by merging or linking related 2007-2009 Tasks & activities and bringing strategic overarching objectives to ongoing activities. This leads to a grouping of just 36 Tasks (compared with 73 Tasks in the previous 2007-2009 Plan). Taken together, these changes to the Work Plan represent an attempt to make the vision of a cross-cutting and user-driven GEOSS clearer for all contributors and participants.

The evolving role of GEO Committees

With the growing maturity of GEOSS the importance of the four GEO Committees is expected to increase. The primary responsibility of the Committees is to provide recommendations on the definition and periodic revisions of the Work Plan and its progress. More specifically:

The Architecture and Data Committee oversees the Tasks that are dedicated to building a transverse GEOSS. ADC members are responsible for addressing all issues involving infrastructure, coordinated observation systems and cross-cutting data sets.

The Capacity Building Committee helps to define and then continuously review the five Tasks dedicated to building capacity for a transverse GEOSS. CBC members also review the capacity-building components in all other Tasks.

The Science and Technology Committee ensures that the Work Plan and its various Tasks reflect the most up-to-date scientific and technological understanding of Earth systems and Earth observation tools. This responsibility includes developing, reviewing and periodically updating the GEOSS Science and Technology Roadmap.

The User Interface Committee takes the lead in assessing the needs and requirements of the end users of Earth observations and ensuring that user needs are reflected in the Work Plan Tasks.

The GCI and Data Sharing: the Cornerstones of the 2009-2011 Work Plan

The four Committees have an essential role in advancing two GEOSS cornerstones: the GEOSS Common Infrastructure (GCI) and the implementation of GEOSS Data Sharing Principles.

The **GEOSS Common Infrastructure (GCI)** consists of a web-based portal, a clearinghouse for searching data, information and services, registries containing information about GEOSS components and associated standards and best practices.

The development and implementation of the **GEO Data Sharing Principles** will also be a key priority for all Committees during the first two years of Work Plan implementation – in order to build full consensus of GEO Members and Participating Organizations for adoption at the GEO-VII Plenary and Ministerial Summit in 2010.

CAS activities within the 2009-11 Work Plan

These focus on contributions to 3 of the 9 GEOSS Societal Benefit Areas (SBAs).

1. Societal Benefit Area: Health

Task HE-09-02: Monitoring and Prediction Systems for Health
Sub-Task (a): Aerosol Impacts on Health and Environment: Research, Monitoring and Prediction

The objective of this task is to facilitate research and development activities that lead to the delivery of new services benefiting society and the environment related to monitoring of the atmospheric cycles of various aerosols and their improved forecast in operational numerical models of the atmosphere. The emphasis of the task will be on reduction of risks due to aerosol influences on health and public safety and on assessing the aerosol effects on marine and terrestrial ecosystems.

The work, to be led by the WMO-AREP-WWRP, will be performed through the cooperation of WMO WWRP-THORPEX, WMO WCRP, GEO, WHO and GESAMP. This task will continue to support international initiatives in developing dust storm warning system and assessments. The task will also review current developments in the modelling and the observation of bioaerosol transport/deposition and in the present understanding of impacts of the atmospheric deposition of dust (iron, phosphorus) to the ecosystem and with the goal of extending the societal benefits of improved prediction of dust and aerosol.

This task represents continuation and extension of the GEO Task HE-06-03 in the 2007-9 Workplan. The main outputs are expected to be,

- Item A:
 - The SDS-WAS Implementation Plan draft will be finalized and submitted to WMO CAS and EC for approval (in 2009).
- Item B:
 - A Scientific Plan for assessing possible links between dust and other environmental conditions on one side, and meningitis outbreaks in Africa on the other side.
 - Developing a project with GEO, WWRP-THORPEX, the Spanish Regional SDS Centre and WHO which addresses the key scientific and technological topics on links between environment and meningitis
- Item C:
 - Scientific paper on the assessment of chemical inputs to the ocean and environmental and climate impacts
 - Executive summary paper addressed to policy makers community on chemical inputs to the global ocean and consequences
- Item C:
 - Reviewing current scientific knowledge of the bioaerosol transport processes, from the emission to the deposition stage
 - Recommendation of establishing international cooperation in research and application of the developments in the bioaerosol science

2. Societal Benefit Area: Climate

Task CL-09-01: Environmental Information for Decision-Making, Risk Management and Adaptation

Sub-Task (a): Towards Enhanced Climate, Weather, Water and Environmental Prediction

The main objective of this co-operative enterprise between WWRP, WCRP, GAW and IGBP, which is led by the WMO, is to strengthen the ability of NMHSs to deliver new and improved climate, weather, water and environmental services and hence increase the capacity of disaster risk-reduction managers and environmental policy makers to make decisions that minimize the societal, economic and environmental vulnerabilities arising from high-impact weather and climate variability and change. The work follows directly from GEO Task CL-07-01 in the 2007-9 Workplan. The Executive Committee (EC) of the WMO has set up a Research Task Team (EC-RTT) to take this work forward.

The main output for the RTT is expected to be,

- (a) A **Strategy** for developing enhanced Climate, Weather, Water and Environmental Predictions which focusses on strengthening prediction research, assessment and the delivery of enhanced services during the next decade.

- (b) Recommendations for the International Organising Committee of the World Climate Conference 3 (WCC-3) to have this **Strategy** endorsed by the high level segment of WCC-3 as a legacy of the WCC-3.

3. Societal Benefit Area: Weather

There are two Tasks in this area. The first is:

Task WE-06-03: TIGGE and the Development of a Global Interactive Forecast System for Weather.

This activity involves completion of the THORPEX Interactive Grand Global Ensemble (TIGGE) Phase -1 (GEO Task WE-06-03) in the 2007-2009 Work Plan. It leads into TIGGE Phase-2 which will consider real-time data exchange, common web interfaces, an improved archiving strategy and a common toolbox to develop useful products.

In the longer term it can also help support and advise the possible ultimate development of a Global Interactive Forecast System (GIFS). The objective of a GIFS would be the production of internationally coordinated advance warnings and forecasts for high impact weather events to mitigate loss of life and property and to contribute to the welfare of all nations, with a particular emphasis on least developed and developing countries. GIFS would require voluntary contributions from national, regional, and international organizations. It is also possible that in the very long term an "End-to-End" GIFS system may feature two-way interactions between the users and the providers of the forecasts, so that user needs and interests can influence the forecast process and enable better services.

As a first step, it is expected that TIGGE Phase1 and 2 will develop initial products related to probabilistic tropical cyclone warning services and precipitation forecasting associated with high impact weather events. These then might form the early products from an initial GIFS.

The main output in Phase-1 is a global data base of ensemble weather forecasts from 10 global production centres available held at 3 archive centers around the world and available for research purposes with a short delay. This is available now and some initial exploratory applications are underway which include tropical cyclone tracks and precipitation forecasting. The focus now is on delivering missing fields to the archive, providing meta-data information etc.

In Phase-2 access in real time will be fully considered and archiving will be reviewed. Additional demonstration products are likely to be generated leading towards ideas for potential routine products in later stages of the project. Ultimately, it is expected that the international coordination of the design, future development, and operation of global observing, data assimilation, numerical modeling, and user application techniques for high impact weather forecasting will yield significant benefits in terms of improvements in the range and quality of services, leading to savings in costs, property, and lives. This will be achieved by (i) a scientifically sound combination of information from the ten existing global NWP forecast providers, and (ii) the global leveraging of NWP and other activities that are yet not well coordinated and to a large extent may be carried out independently by national and regional forecast centers.

The second Task is

WE-09-01: Capacity Building for High Impact Weather Prediction

Sub-Task (b): Socio-economic benefits in Africa from Improved Predictions of High Impact Weather

This work aims to enhance the prediction of high impact weather and help reduce vulnerability to climate variability in Africa through the WWRP-THORPEX Africa initiative

which is designed to both accelerate predictive skill and realize the related benefits for African society and the economy through a set of priority demonstration projects.

THORPEX Africa will closely collaborate with international weather centers and interface with the climate community for better monitoring and development of a seamless suite of weather and climate forecasts. Joint WCRP/Clivar Africa –THORPEX Africa initiatives will be promoted.

In addition the following will be implemented:

- exchange programs to build the capacity of African research and operational communities on common THORPEX-Africa activities and GEO related benefit areas.
- promotion of more formal cooperative agreements between African Universities and NMHSs. Many NMHSs can use the human resources potential in Universities and research institutes very profitably.
- Use improved high impact weather/climate forecasts in Africa via THORPEX demonstration experiments to help raise awareness and gain further support from more African nations for the programme. Given the Global NWP Production Centers general willingness to help, this activity could have an impact quickly across Africa.

Concluding Remarks

The progress made by GEO was welcomed at the recent G8 meeting. As well as more than 50 international organisations there are now 74 member countries plus the EU and the number continues to grow. The development of the GEOSS is moving to a more strategic phase as is clear from the structure and objectives of the new 2009-2011 Work Plan. The current version can be downloaded from http://www.earthobservations.org/geoss_imp.shtml.

The implementation of the GCI and adoption of common data sharing principles will be necessary for the success of the whole initiative. The contributions from the CAS area of responsibility (and the WMO more generally) form very important elements of the new GEO Work Plan and GEOSS. This is a two way supportive relationship in which the GEO framework can help CAS deliver its objectives in these areas by linking activities, providing visibility at ministerial level and identifying resource mobilisation opportunities. Web materials from TIGGE and the SDS-WAS projects will be featured in a virtual presentation during the GEO Plenary V (Bucharest, 19-20 Nov.).