



GROUP ON
EARTH OBSERVATIONS

GEO-VI

17-18 November 2009

The GEO Baseline Initiative

Document 10

for information

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1 INTRODUCTION

The Group on Earth Observations, GEO, is uniquely positioned to meet the integrated data needs for many upcoming global scientific assessments. 2010 is a critical start date for global initiatives on climate change, forest and carbon monitoring, ecosystem assessment and valuation, and biodiversity conservation. These initiatives will require assessing and monitoring the state of the world's land, air and water. They can be better supported by consistent, validated, inter-operable and accessible global baselines of fundamental Earth parameters, for example, land and forest cover, agriculture, human settlements and soils. Such baselines will be even more valuable for decision-makers if they are available in common, inter-operable formats. 2010 is equally an important year in the life of GEO with the upcoming GEO Summit, Plenary and mid-term review.

A guiding principle of GEO is that a single dataset can serve many sectors of society. For example, current and reliable land cover data are key to predicting and mitigating disasters, monitoring ecosystem health and services, protecting human health, conserving biodiversity and assessing water availability. Much as the 1957 International Geophysical Year (IGY) was intended to allow scientists from around the world to take part in a series of coordinated observations of various geophysical phenomena, this initiative calls on scientists and researchers to further coordinate existing GEO data activities, and to fill the current data gaps as to better serve integrated assessments and monitoring. As such, the Initiative is not a replacement for on-going activities; rather it serves as a focal point for stepping-up activities in 2010.

This Baseline Initiative may thus become the standard for retrospective and future monitoring. It could support the existing and evolving mandates of many international mechanisms and agreements, and serve the research community, as well as decision-makers, managers and the public. It could also play a key role in developing strategies for adaptation to climate change.

2 THE GEO 2010 BASELINE INITIATIVE

The GEO 2010 Baseline Initiative is a coordinated effort to call on GEO Members, Participating Organizations and the public to assemble shared, inter-operable products that will be used to establish a baseline for the year 2010 of bio-environmental conditions, as well as indicators of ecosystem functioning and services. The first step will support the development of interoperable datasets of imagery and derived products.

There are many datasets that have already been offered as contributions to GEOSS that would also serve as 2010 Baseline data. Some data have already been produced, and some are in-production or planned. There are also gaps that must be filled. An important aspect of the initiative is to ensure that the data are inter-operable and accessible, which will enhance their use by reducing pre-processing time, cost and redundancies. The principal 2010 datasets will be selected as to their benefits to the largest array of users, and to the benefits of using datasets in tandem to support the development of baseline information. For example, these data are interdependent: phenology data improves land cover classification, while transportation and hydrography variables are needed for land use modelling, elevation data improve hydrologic models etc. Existing and new data that are anticipated include land cover and land use, digital elevation models (DEMs), vegetation phenology and growing season, agriculture extent and condition, hydrology, marine and transportation, including satellite, aerial and in situ observations. Many of these fundamental and socio-economic datasets are current GEO activities

(Task number in parentheses), whose value could be enhanced by improving inter-operability and access, and augmenting them with new and/or more current data:

- Temporal Phenology Metrics (US-09-03d);
- GEO Ecosystem Classification and Mapping (EC-09-01a);
- Global Road and Human Settlements Mapping (US-09-02c);
- Socio-economic and Demographic Global Data (US-09-02b);
- Land Cover and Land Cover Change (DA-09-03a);
- Forests (US-09-03b; EC-09-01e);
- Global Soil (US-09-03c);
- Global Soil Moisture (WA-08-01a);
- Hydrology and Precipitation (WA-08-01).

The GEO 2010 Baseline Initiative can be achieved through on-going, user-driven GEO activities in the areas of data continuity and sharing, interoperability, standards development, capacity building, user outreach and data validation. The initiative will benefit from these efforts and strengthen them. Its results will be accessible through the GEOSS Common Infrastructure.

3 WHO WILL BENEFIT?

3.1 GEO Societal benefit Areas and Cross-cutting Activities

The 2010 Baseline is cross-cutting, and therefore will support all SBAs, and especially serve interdisciplinary cross-cutting projects and studies such as:

- Biodiversity and Climate Change: predicting species distribution based on climate change scenarios;
- Land Cover and digital elevation models (DEMs) for landslide prediction, mitigation and remediation;
- Sea-level Rise and Populations at Risk;
- Co-benefits of Carbon Sequestration, Soil and Water Conservation, and Biodiversity Conservation;
- Land Use and Human Health Impacts (e.g. ground-level ozone);
- Phenology (growing season) for human health (early asthma warning), and Agriculture (application of fertilizer, pesticides and herbicides).

3.2 International Agreements, Mechanisms and Activities

The 2010 Baseline will support the mandates of many international agreements and mechanisms including:

- The Convention on Biological Diversity (CBD): Indicators of biodiversity status and trends;
- The UNFCCC: Forest cover and condition; Biomass and Carbon;
- Inter-governmental Panel on Climate Change (IPCC);
- UNEP Global Environmental Outlook (UNEP-GEO);

- The Convention to Combat Desertification (UNCCD);
- Ramsar Wetland Convention;
- FAO Forest Resource Assessment (FAO-FRA).

For example, baseline data will be used to support the development of a 2010 baseline in support of the Convention on Biological Diversity's (CBD) mandate for biodiversity conservation, and the UNFCCC efforts to reduce carbon emissions and sequester carbon. The Initiative will also support the on-going activities of global, regional, national and local governments and institutions:

- UNEP-World Conservation Monitoring Centre (WCMC): data for monitoring status and trends in protected areas;
- UNESCO World Heritage Sites: monitoring status and trends;
- NGOs: Conservation International, WWF, WRI, The Nature Conservancy, RFF, WCS et al.;
- Academia: research and applied research;
- Nations;
- Local communities and the general public;
- Policy and decision-makers, and resource managers at all levels.

4 CONCLUSIONS

While admittedly a large undertaking, the GEO 2010 Baseline Initiative is vital for characterizing assessing and monitoring the Earth system. It will:

- Provide valuable, shared and inter-operable datasets to support inter-governmental activities, research, analysis and decision-makers;
- Serve as a rallying point among GEO Members to identify and fill critical gaps in our knowledge of the status of the Earth system and resources;
- Promote public awareness on the need for Earth observation data to understand our changing planet;
- Advance GEO implementation and widen the sphere of contributions among existing and new members and Participating organizations.

The Initiative will be implemented through a step-wise approach. It will first focus on building a set of key datasets. From these datasets, a selected number of products can be delivered in a reasonably short time scale, as early as the end of 2010. Others will require more complex analyses and interpretation, and will only be available in the 2011-2013 timeframe. It could be envisioned that the early achievements could be presented to the Ministers convening in 2010 at the GEO Summit as exemplars of early achievements of the Initiative. This might then lead to a call to the Ministers to support a full implementation of the Initiative.

GEO is therefore calling upon its Members and Participating Organizations to participate in the GEO 2010 Baseline Initiative to create and make available global datasets that support multiple sectors of society. The Initiative will present a clear and concise application of coordinated and integrated Earth observation data that will be presented to the 2010 GEO Summit and Plenary.