

## **How the Group on Earth Observations (GEO) is advancing global collaboration on monitoring forest carbon**

### **What is GEO?**

The Group on Earth Observations (GEO) is linking together the world's diverse environmental monitoring networks, instruments, data bases and models to form the Global Earth Observation System of Systems (GEOSS). The purpose of this effort is to provide critical information for decision-making in nine "Societal Benefit Areas". The cross-cutting data and analyses disseminated by GEOSS will help countries protect themselves against natural and human-induced disasters, understand the environmental sources of health hazards, manage energy resources, respond to climate change and its impacts, safeguard freshwater resources, improve weather forecasts, manage ecosystems, promote sustainable agriculture, and conserve biodiversity.

GEO was established in 2005 after the World Summit on Sustainable Development (WSSD), the Group of Eight leading industrialized countries (G8) and three ministerial Earth Observation Summits all called for improving existing satellite, aerial, ocean and land-based observation systems and related decision-support applications. Its membership now includes 73 countries and the European Commission; 51 "participating organizations" also contribute to its work.

### **A collaborative approach to carbon monitoring**

The most scientifically and technologically robust monitoring system for forest carbon will require integrating data from diverse remote-sensing and in-situ instruments. These instruments, however, are owned and operated by different countries and organizations. GEO has therefore started to coordinate the national and regional forest-carbon monitoring activities of its Members and Participating Organizations. The goal is to create a monitoring system that can ensure the availability and sustainability of systematic, long-term observations and of reliable tools and methodologies for measuring changes in forest carbon.

A key advantage of combining the efforts of different countries and agencies is that it would provide access to all the necessary technologies and techniques, something no currently existing programme or system is able to provide. It will ensure the integration of data from different satellite systems, thus including optical and radar-derived imagery at various resolutions with in-situ observations and models of forest carbon content. This global system will make new remote-sensing tools universally available and will render national data comparable. At the same time, it will accommodate each country's national in-situ measurements and respect its unique socio-economic conditions.

GEO is also working actively on the broader, cross-cutting issue of forest monitoring. This involves gathering and disseminating information on land-use change, biodiversity trends, water, agriculture and climate change. These interlinked issues will be addressed by a major Symposium being organized by GEO and Brazil's National Institute for Space Research (INPE) in Iguaçú, Brazil, from 4 – 7 November 2008. The outputs of GEO's forest monitoring activities will provide useful inputs for the more specific purpose of carbon monitoring.

### **Practical implementation**

GEO's approach to forest carbon monitoring has been developed through a series of meetings over the past six months with governments, research institutes, foundations and NGOs. Most recently, a key session on 16

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June brought together, among others, representatives from Australia, Finland, Japan, Norway, the European Commission, the Food and Agriculture Organization (FAO), the Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD), the Committee on Earth Observation Satellites (CEOS) and the Global Terrestrial Observation System (GTOS) to develop a plan of action.

GEO has now set out on its road to developing a collaborative forest carbon monitoring system. This work will focus on coordinating the needed observations and securing their continuity. GEO will define, develop and validate robust tools and methodologies for evaluating carbon storage in forests; identify capabilities and gaps; and ensure that all countries have access to, and the capacity to use, forest carbon data and analyses.

The organizations participating in this work have defined the following preliminary list of short-term objectives to be achieved over one year horizon:

- consolidate observation requirements (both remote sensing and in situ) and reference products, together with preliminary plans for systematic observation;
- coordinate the provision of remote sensing data and integrate data from different sources in order to ensure operational observations and relevant products (including optical and multi-band SAR); and
- define and activate a limited number of test sites for pilot projects focused on in situ observation, validation of methodologies and tools, and capacity building.