FOREST CARBON TRACKING
INTRODUCTION

The Group on Earth Observations (GEO) established the Forest Carbon Tracking (FCT) task in 2008 to provide operational support to countries wishing to establish a national system for forest monitoring and carbon reporting.

The FCT initiative will facilitate access to long-term satellite, airborne and in situ data, provide the associated analysis and prediction tools, and create the appropriate framework and technical standards for a global network of national forest carbon tracking systems. The task follows the guidelines set out by the United Nations Framework Convention on Climate Change (UNFCCC). Its outputs will be available to support interested countries in their efforts to implement the Convention.

The task is being carried out by a partnership of GEO member governments, key UN bodies, space agencies, the science community and the private sector.

Selective logging and forest degradation in Brazil based on Landsat data

Multi-temporal composite of Landsat data of the Congo Basin © Hansen, South Dakota State University (SDSU)
THE CHALLENGE

The greatest environmental challenge of the 21st century is to address global climate change by reducing the rate at which greenhouse gases are released into the atmosphere through human activity. The Intergovernmental Panel on Climate Change (IPCC) has indicated that up to 20% of global greenhouse gas emissions can currently be traced to deforestation. There is clearly an urgent need for coordinated international action to monitor forest carbon stocks and emissions.

Forests play an important role in biological carbon storage and are crucial for stabilising Earth’s climate through their influence on global carbon, water and energy cycles. In addition, they protect the local environment from erosion, floods and drought. Forests are important sources of food, medicines and building materials. They also provide homes for many communities and are crucial habitats for wildlife.

As well as preserving an invaluable component of the environment, efforts to minimize deforestation and increase reforestation can reduce greenhouse gas emissions. However, for a country aiming to reverse deforestation, and to be credited for doing so, the monitoring, reporting and verification (MRV) systems that will be established are dependent on reliable satellite data and the appropriate tools for analysis.
TRACKING FOREST CARBON

Recognizing the global need to monitor the Earth’s forests, GEO established the FCT task to assist countries develop their own forest and carbon monitoring systems. The FCT initiative will coordinate data from Earth observation satellites, validate these data via in situ forest measurements, and utilize them in forest carbon models. This will ensure that reliable information of suitable consistency, accuracy and continuity is generated to support forest carbon MRV systems.

Taking into account national circumstances, a comprehensive approach to estimate country-wide emissions should be based on geographical maps that are updated on a yearly basis. Consistent time series provided by satellite images will help countries to implement its ‘wall-to-wall’ full country coverage over time. The FCT team has identified the following key elements as essential:

- Easy access to a continuous supply of mid-resolution Earth observation satellite data
- Sufficient in situ forest measurements for emission verification
• Appropriate methods to estimate and predict future national or sub-national carbon stocks

• Spatial-data infrastructure, Graphical Information Systems (GIS) and web-delivery systems to produce reports according to prescribed UNFCCC accounting and reporting rules

THE PATH TO IMPLEMENTATION

The GEO FTC initiative will pave the way for countries to establish national MRV systems as part of a global network via eight main actions:

• Obtain a commitment from CEOS member space agencies to provide continuous optical and radar satellite data, and the tools and training suitable for wall-to-wall forest carbon tracking.

• Guide countries on methods for satellite data processing and tools and standards for producing verified forest information products, such as annual mid-resolution wall-to-wall time series for forest change assessments

Forest degradation in Cameroon based on Landsat data
and information on areas undergoing forest degradation.

- Develop guidance documents for ground measurements that link forest inventories, remote-sensing data and carbon models.

- Evaluate and agree on validation procedures and accuracy assessment for the remote sensing of forested areas and for carbon stock estimates.

- Establish a growing network of ‘National Demonstrator’ countries, initially from the three major tropical forest regions: Southeast Asia, Africa and South America.

- Raise awareness of progress and demonstrations as inputs to UNFCCC and other major international events, making clear the policy implications of the new technical capabilities.

- Create a coordinated network of processing facilities that will ensure established standards are used and that countries are supported with the processing of key data products.

- Based on the successful implementation, demonstration and political acceptance of the system, assign operational responsibility for its coordination and operation to an appropriate international body or agency.
BUILDING CAPACITY

Building capacity to establish efficient and sustained forest monitoring and carbon accounting system in developing countries is critical. It requires support for methods and procedures, institutional development, international reporting technical assistance, training and educational programmes. The FCT task aims to quickly move from being a ‘technical capability demonstration’ to being an active support mechanism for the establishment of operational forest MRV systems in the following years through the complementary assistance of donor countries, UN bodies, NGOs and technical expert panels currently involved in related capacity building activities.

Australia, Brazil, Cameroon, Guyana, Indonesia, Mexico and Tanzania are already taking part in the task as ‘National Demonstrators’, and others have expressed interest in playing this role from 2010 onwards. The development of human and technical capacity in the countries involved is a critical component of the task, as an increasing number of tropical forest countries are expected to become part of the GEO network and to eventually contribute to a Global Forest and Carbon Monitoring System.
THE FCT PARTNERSHIP

The development of the GEO FCT task is being led by governments with a strong interest in forest carbon monitoring: Australia, Canada, Japan and Norway. The Committee on Earth Observation Satellites (CEOS) and the UN Food and Agriculture Organization (FAO) are two other lead partners, while institutions in GEO member countries, Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) and the EC Joint Research Centre play important roles. CEOS has committed resources from the world’s space agencies to provide a coordinated contribution to the task with the European Space Agency (ESA) ensuring the coordination of CEOS inputs to the task. National space agencies engaged to date are Brazil, Canada, Germany, India, Italy, Japan and the USA. Seven governments have agreed to cooperate as ‘National Demonstrators’ for the project in 2009-2010. They are Australia, Brazil, Cameroon, Guyana, Indonesia, Mexico and Tanzania.

portal.geo-fct.org

Established in 1984, the Committee on Earth Observation Satellites (CEOS) coordinates civil space-borne observations of the Earth. Participating agencies strive to enhance international coordination and data exchange and to optimize societal benefit. Currently 28 space agencies along with 20 other national and international organizations participate in CEOS planning and activities.

www.ceos.org

ESA, the European Space Agency, is Europe's gateway to space. It is an international organisation with 18 Member States. ESA's mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world.

www.esa.int