

The background of the cover is a composite image. The left side shows a low-angle shot of a large tree trunk in a forest, looking up towards the canopy. The right side is a satellite-style map of a forested area, with green representing forest and brown/white representing cleared land or roads. A semi-transparent green horizontal band runs across the middle of the image, containing the main title and subtitle.

Space Data Services

Support for National Forest Monitoring Systems

The Global Forest Observations Initiative

Version 1.2
February 2016

What is GFOI?

Background and Introduction

The Global Forest Observations Initiative (GFOI) is an initiative of the inter-governmental Group on Earth Observations (GEO) that aims to:

1. Foster the sustained availability of observations for national forest monitoring systems;
2. Support governments that are establishing national systems by providing a platform for coordinating observations, providing assistance and guidance on utilising observations, developing accepted methods and protocols, and promoting ongoing research and development; and

3. Work with national governments that report into international forest assessments such as the national greenhouse gas inventories reported to the UN Framework Convention on Climate Change (UNFCCC) using methods of the Intergovernmental Panel on Climate Change (IPCC).

The purpose of this document is to introduce the GFOI Space Data Services – a selection of services that provide a case-by-case response to a country's satellite data needs, which are not always adequately covered by the baseline strategy, and which take into account national needs as well as existing/planned capacities and relationships.

The Five Components of GFOI

The work of GFOI is undertaken by five components, shown below. The Coordination of Satellite Data Supply (The Space Data Component of GFOI) is the responsibility of the CEOS Space Data Coordination Group (SDCG) and is explained on the following page.



Space Data Component of GFOI

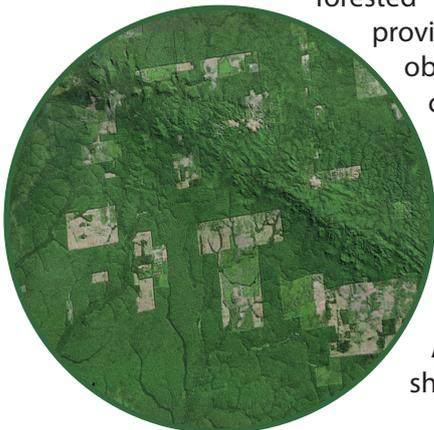
The Space Data Component of GFOI

The Committee on Earth Observation Satellites (CEOS) has effectively coordinated space-based acquisitions since 2009 in support of Forest Carbon Tracking (FCT) demonstration activities. Based on the FCT experience, CEOS has accepted responsibility for coordination of the satellite data contribution to the observations and measurement component of GFOI to ensure the regular and systematic observations and measurements for effective reporting. This will ensure continuity of data supply for the maintenance of consistent time series.

Recognising the magnitude of the challenge involved in meeting the requirements of the countries, given the global scale and sustained coverage needed, and the need for significant and sustained effort, CEOS at the 25th CEOS Plenary, in 2011, agreed to the establishment of a dedicated Space Data Coordination Group (SDCG) for GFOI charged with defining and implementing a three-part strategy as a framework for its coordination efforts, comprising: the Baseline Global Data Acquisition Strategy, the Space Data Services for GFOI, and data supply in support of GFOI R&D activities.

Baseline Global Data Acquisition Strategy

A coordinated Baseline Global Data Acquisition Strategy involving a number of space-based core data that can be used and shared free-of-charge for GFOI purposes. This involves systematic and sustained wall-to-wall Earth Observation (EO) acquisitions of forested areas globally and provides the default forest observations data for all countries without specific technical requirements, heritage, or data preference (such as for a particular mission or data type). This Baseline Global Data Acquisition Strategy should guarantee the



minimum consistent space data provision necessary for all interested countries to engage in reporting to the UNFCCC under the provisions of a future climate treaty. This includes the requirements for Reducing Emissions from Deforestation and Forest Degradation in developing countries (REDD+) and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries. To this end, the Baseline Global Data Acquisition Strategy needs to assist implementation of the methodologies described in the Methods & Guidance Documentation (MGD).

Space Data Services

A coordinated strategy for national data acquisitions will accommodate the needs of countries that have specific technical requirements or heritage and experience on working with a particular EO data source or type. It will also accommodate the numerous intergovernmental arrangements that may exist or emerge for the supply of certain data to one or more countries. This will involve a wider range of satellite data sources, including data that are ordinarily provided on a commercial basis.

Data Supply in Support of GFOI R&D Activities

This includes support for: science studies assisting the development and evolution of the MGD for GFOI; satellite sensor interoperability; time series consistency; forest degradation; and validation activities. Many R&D activities will also need satellite data that, for operational purposes, is provided commercially. However, they are often developed in cooperation with CEOS agencies - giving the agencies the right to support R&D projects with data free of charge.



The GFOI Space Data Services

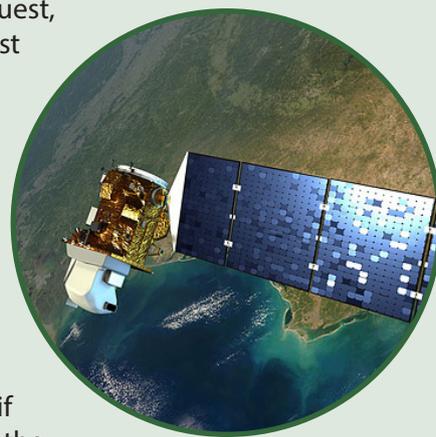
GFOI Space Data Services Strategy

In order to deliver the three-part strategy, the SDCG has developed a set of Space Data Services for GFOI. The objective of these services is to provide more country specific support, based on national needs as well as existing/planned capacities and relationships. The Space Data Services Strategy focuses on direct support to individual countries, typically in cooperation with FAO/UN-REDD and the World Bank's FCPF, in relation to their Space Data Service needs.

The Six GFOI Space Data Services

The GFOI Space Data Services are:

1. **Regional GFOI Space Data Workshops** — including leveraging the substantial contribution of existing GFOI capacity building efforts in Africa, South America and Southeast Asia, to build relationships and determine requirements and priorities.
2. **Impartial National Space Data Needs Assessments** — as a service to individual governments seeking to establish their MRV strategies and the role of space data therein; SDCG will help determine their capacity and requirements for all kinds of space data including core, contributing, and commercial data.
3. **National Historical Coverage Reports** — to assess, on request, what satellite data exist for a given country or region for past years, including that in support of setting reference levels for national reporting obligations under UNFCCC.
4. **Ensured On-going Coverage** — tailored support to ensure that on-going national baseline acquisitions are included in the long-term acquisition strategies of all supporting data.
5. **Satellite Data Discovery, Assembly & Delivery** — support for the fundamental tasks around identifying and, if necessary, delivering data (or derived products) supplied by the core data supply agencies for national coverage.
6. **Cloud Storage, Processing, and Analysis of Satellite Data** — via the Space Data Management System (SDMS) and other GFOI Space Data Services prototypes for countries whose spatial data infrastructure necessitates a virtual national capability for GFOI. This system will be developed in close cooperation with FAO and will ensure compliance with the MGD and IPCC guidelines for the national reporting obligations.



The GFOI Space Data Services

Examples of GFOI Space Data Services Activities

Regional GFOI Space Data Workshops

Building on the series of SilvaCarbon workshops that have been organised in South America, the first Asian regional workshop took place in January 2014 in Chiang Mai, Thailand. The forest monitoring workshop was titled: "South East Asia GFOI Technical Initiative" and covered a number of GFOI topics including the Global Baseline Data Acquisition Strategy, the Space Data Services, Research & Development, and the Space Data Management System (SDMS).

The African series of GFOI regional technical workshops will be initiated in Cameroon in June 2014. The workshop has an overall aim of supporting participating countries to develop a data plan for their needs in the context of REDD+, as well as to explore new and existing methodologies to develop products from remote sensing data.

National Historical Coverage Reports

The CEOS Systems Engineering Office has already produced national historical coverage reports for a number of countries which analyse the Landsat archive to assess what data exists for a country. The reports include a summary of what mission the data comes from, the number of scenes acquired, the dates of the acquisitions, cloud cover statistics, and details on the available processing level.

The Space Data Management System

The Space Data Management System is planned to be an online portal for access to space data, processing tools, and a cloud-storage infrastructure.

Major obstacles for users of satellite imagery are the very large data volumes and the computer hardware requirements for timely processing of products.

The SDMS has been developed to reduce the technical infrastructure barrier for countries seeking to set up a national forest monitoring system that can provide input to national MRV systems for GHG emissions and removals in IPCC-compliant reporting to the UNFCCC mechanisms, such as REDD+.

The SDMS will offer a number of functions, including:

- dedicated storage and cloud-computing infrastructure;
- data archive search and access;
- access to the CEOS Visualization Environment (COVE), coverage analyser, and Google Earth Engine;
- an open-source processing environment;
- linkages to training and capacity building materials;
- secure access to global baseline and custom datasets;
- the ability to download/upload datasets and analysis tools;
- access to general and open-source tools, including mosaics tools for the removal of clouds; and
- the ability to conduct analyses and develop reports (including historical coverage and cloud-cover reports) for delivery or local storage.



How To Get Support

SDCG Contact Information

For queries related to the GFOI Space Data Services, please contact the Space Data Coordination Group for GFOI. For all other enquiries, please contact the GFOI Office.

CEOS Space Data Coordination Group for GFOI

Email: spacedata@gfoi.org

GFOI Office

Email: office@gfoi.org

Website: www.gfoi.org

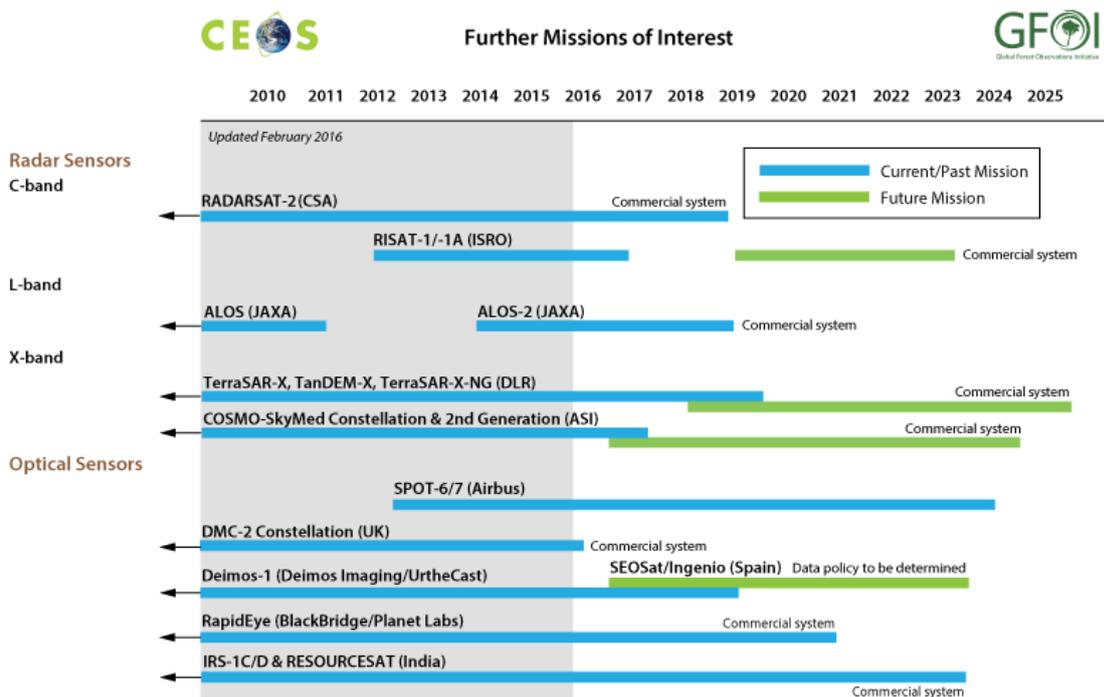
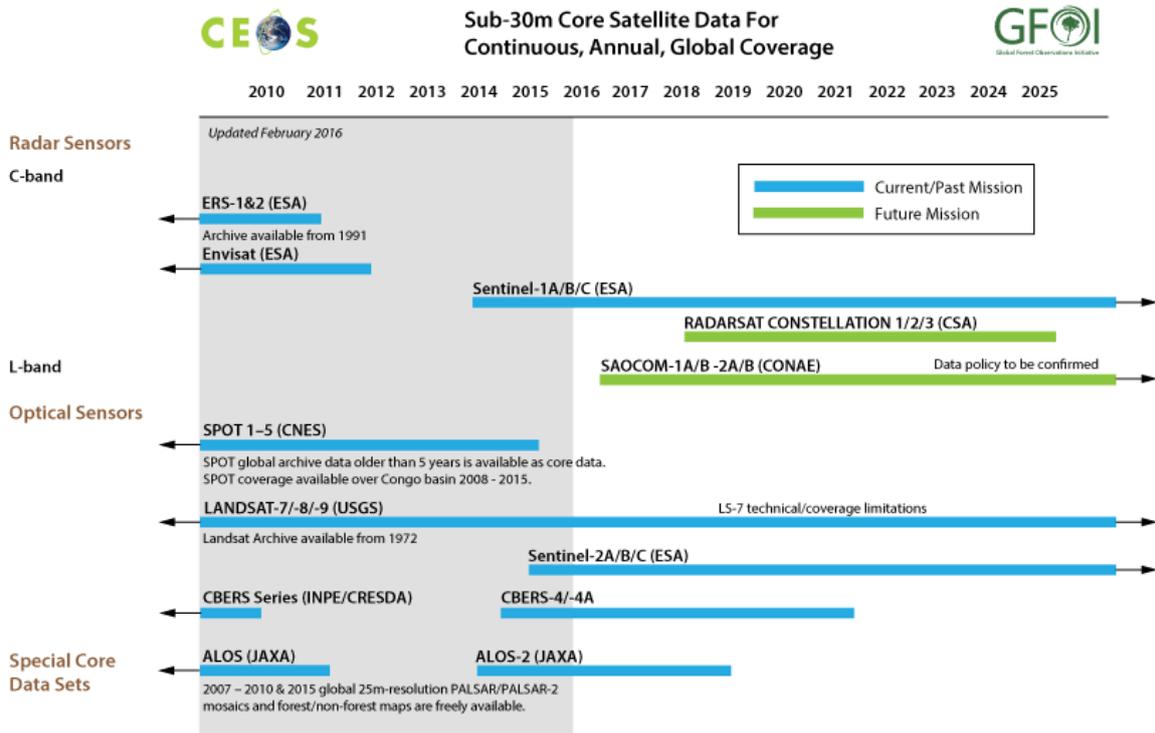
Capacity Building

For more information on SilvaCarbon and the regional GFOI space data workshops, please contact Sylvia Wilson at: snwilson@usgs.gov



Core, Contributing, and Commercial Data for GFOI

The following timelines display the core, contributing, and commercial data which is relevant to both the Global Baseline Data Acquisition Strategy and the Space Data Services for GFOI.



There are also numerous missions in planning by several countries that may be of value – including many high resolution missions of interest for validation. Few datastreams will have the capacity to provide routine global coverage, but many more will be able to contribute to national and regional coverages.



GFOI

