

International Partnership
Space Programme



Case Study

Advancing Earth Observation Applications for Forests

Project lead



Prepared by



Advancing Earth Observation Applications for Forests

Overview

Satellite Earth Observation (EO) offers an unrivalled approach to monitoring forests, especially for conservation, changes in land use, fires and forest health. However, its application globally has been fragmented, with limited scale and inconsistencies in approach, making it difficult to share results. In addition, datasets can be very large, making them expensive to access and download for analysis in a geographical information system (GIS).

With funding from UK Space Agency's International Partnership Space Programme (IPSP) Ecometrica has developed a cloud-based content management system that enables stakeholders to easily access and interrogate packages of information from regional hubs called Earth Observation (EO) Labs. This has already led to an award of \$1 million to a conservation project in Mexico which is using a local EO Lab.



Partners

- Universities of Edinburgh and Leicester, and Imperial College London
- UK – Carbomap, DMC International Imaging (DMCii)
- Brazil – INPE, Iakira, IPAM, KeyAssociados
- Mexico – Ambio, El Colegio de la Frontera Sur (ECOSUR), EcoLogic, Pronatura Sur

Challenge

Numerous organisations globally want to gather information about forests and there is a huge volume of relevant data available. However, raw data typically requires large bandwidths for download, expensive infrastructure for storage and analysis, and teams with the appropriate expertise to interpret and present it. Where any analysis has already been done, it may be hard to find and results are not presented in a consistent format.

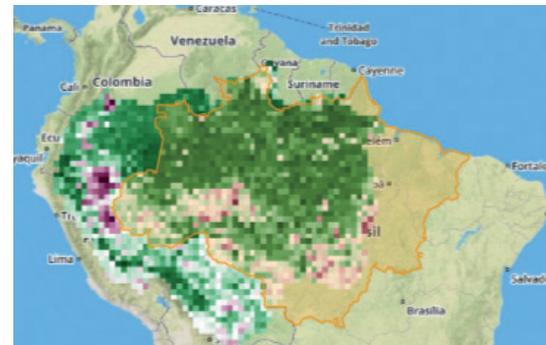
These aspects make it particularly challenging for developing countries which may have neither the funding nor the expertise to get the information they need in order to deal with issues such as conservation, including any changes in land use, the health of the forest and the impact of human activity, fires or disease.



Ecometrica Executive chairman Richard Tipper demonstrating EO Lab applications during a workshop in Mexico

Solution

The partners have set up a network of virtual regional EO Labs which will make appropriate EO data available through a collection of applications that are suitable for forestry management. Each EO Lab is based on Ecometrica’s Mapping platform and has access to a broad range of cloud-based satellite data. These datasets can be combined with data gathered on the ground and information from studies, and use models, such as the University of Edinburgh’s Cardamom (Carbon Data Model Framework) programme, in order to present a broader and more reliable picture of areas of interest.



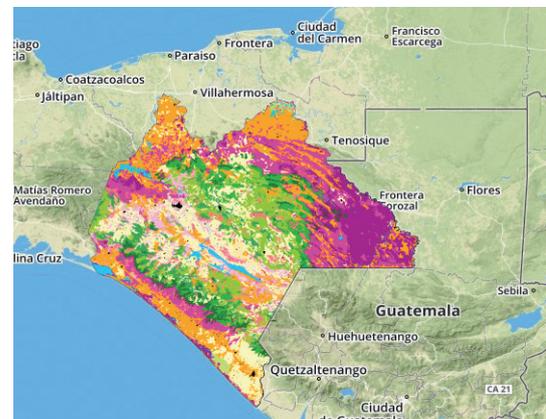
University of Edinburgh’s CARDAMOM application in use on its EO Lab

The first EO Labs are being hosted by Brazilian space research institute INPE, Mexican research centre ECOSUR, University of Edinburgh and Imperial College London. Each EO Lab will offer services relevant to its region and specific interests, but because the data is hosted in the cloud, they will be able to share or distribute information from the other regions.

End-users will be able to access and interrogate validated data via a simple interface, developed by Ecometrica.

IPSP benefits

IPSP funding has enabled a series of regional data hubs – called EO Labs – to be established which for the first time provide a unified view of forestry-related data that is easy to access: this has already resulted in external funding for one project that is using the service. IPSP has facilitated world-class research into the calibration and validation of forest change detection methods, advancing the understanding of how accurate and suitable different methods are for detecting deforestation and degradation in different regions and forest type.



Application on ECOSUR EO Lab showing vegetation and land use for state of Chiapas

For lead partner Ecometrica, the IPSP project has given a greater understanding of each partner country’s needs for new EO products, along with the latest knowledge on the capabilities of different satellite sensors, both of which have fed into its business model for future work in those countries. Building new relationships with IPSP partners, such as the University of Maryland, has been also valuable, not just from a business development perspective but also for potential scientific and research collaborations in future.

There has also been some cross-fertilisation with other IPSP projects, particularly those in Brazil, which Ecometrica hopes may lead to collaboration in future.

Outcomes & Future

In Mexico, use of the local EO Lab has already helped a conservation project in the state of Chiapas (led by Mexican non-governmental organisation Ambio) to get funding of over \$1 million from the Global Environment Facility. Local organisations need to monitor over 100,000 hectares of the El Ocote Biosphere Reserve and surrounding areas that affect it. Using satellite-derived information should help conservationists, led by Ambio, to deploy resources more effectively and efficiently.

Ecometrica is also using EO Lab technology to monitor impacts of support given by the Department for International Development through the International Climate Fund programme relating to avoidance of deforestation in Brazil.



Field visit to the El Ocote biosphere, Mexico

Ecometrica is continuing to identify potential end-users in Mexico and Brazil, and to gather their requirements. This includes over 30 state forest authorities in Mexico and rural credit agencies and the agricultural industry in Brazil. The company is also examining the business case for new satellite sensors that could produce additional datasets, information which could benefit these and other new users.

In future Ecometrica expects more local conservation activities in Mexico and Brazil to be assisted by their local EO Labs. In addition, the technology could be extended to other countries and to other sectors, such as agriculture and natural resource management.

Ecometrica's IPSP INSIGHT

Working with international partners on a project with a short timeframe exacerbates issues related to institutional administration, so it is important to be aware of any potential impact this may have on the project and to find ways to incorporate that in the planning. However, such projects can open other opportunities, so the time invested in addressing this can be a good investment in the long term.

IPSP

The International Partnership Space Programme was a two year, £32 million pilot programme established and led by the UK Space Agency. The aim of the programme was to open opportunities for the UK space sector to share expertise in real-world satellite technology and services overseas and develop international partnerships for mutual benefit. The objectives for this programme were to show the benefits that UK satellite or space technology can provide above and beyond terrestrial solutions; these were provided in terms of societal or economic benefits, for countries that currently do not have these capabilities or wish to develop them further. The aims were for the UK to learn from partnerships with these countries and to establish the UK as the partner of choice with these countries once they are in a position to acquire or enhance their own space or satellite infrastructure.

UK Space Agency

The UK Space Agency is an executive agency of the Department for Business, Innovation and Skills (BIS) and lies at the heart of UK efforts to exploit and benefit from investment in space technologies and satellite applications. The Agency was created on 1 April 2011, and for the first time integrated UK civil space policy and the majority of programme funding from across Government, the Research Councils and Innovate UK (formerly known as the Technology Strategy Board).

To view profiles of IPSP partners and learn more about satellite applications in emerging markets visit: starhub.sa-catapult.co.uk