

Forest Monitoring service for REDD+

As the 18th Commonwealth Forestry Conference is about to begin in Edinburgh, DMCii has launched a new service specifically tailored to help in the fight to conserve global forests. DMCii's Global Forest Monitoring service uses satellite imagery to produce easily-understood maps of forest cover change.

The service's wide-area forest surveys can be updated annually, monthly - or more often still for areas judged most at risk - delivering the timely data necessary for operational management.

This week's Commonwealth Forestry Conference has the theme of restoring the Commonwealth's forests. Together the 54 states of the Commonwealth are home to 800 million hectares of forest, representing 20% of the world's remaining trees. The Conference is discussing conserving current forested areas and restoring lost forests as a means of benefiting regional habitats and communities - as well as tackling global climate change.

The world's forests form a significant stock of carbon, which is being released as CO₂ as forests are impacted by human intervention. The tropical rainforests hold 80% of forest carbon and the destruction of these is responsible for around 20% of anthropogenic carbon emissions. Among the subjects under discussion during the Conference is an UN-led initiative called REDD+ (Reducing Emissions from Deforestation and Degradation), which aims to place a value on intact forests by paying governments to prevent their destruction.

However REDD+ requires reliable and timely information on the state of the forests. Satellite imagery is the only effective way of mapping such vast areas on a regular basis, but it can still take a long while for individual satellites to build up a complete regional picture, especially as tropical rainforests are often covered by clouds. In the past, forest maps could only be updated every five to 10 years, leaving them of limited practical use.

DMCii's Global Forest Monitoring service is based around a constellation of six satellites known as the Disaster Monitoring Constellation which work together to provide rapid mapping services. Independently owned but collectively coordinated, the satellites have a joint daily repeat imaging capability for anywhere in the world, meaning that even cloudy areas can be imaged frequently enough to achieve full coverage.

The first generation Disaster Monitoring Constellation satellites offer optical imaging at 32m ground sample distance (GSD) with a very wide 650 km swath capable for example of covering the entire UK in a single pass. Last year two new satellites were launched, UK-DMC2 and Deimos-1, with 22m GSD, effectively doubling the number of pixels per hectare and greatly boosting the constellation's overall imaging capacity. Each Disaster Monitoring Constellation satellite observes in three spectral bands compatible with Landsat - the world's longest running Earth-observing satellite series - so long term forest changes and many types of degradation can be identified.

Information derived from the satellites is used to provide maps of forest/non-forest regions, clear cut areas, logging roads and forest degradation. The service is also intended as a means of training and building capacity in the use and processing of satellite data, deriving information maps from data and interpretation of forest maps.

"Our new Global Forest Monitoring service is derived from our work partnering with governments and institutions on a number of existing forest initiatives," said Paul Stephens, DMCii Director Sales and Marketing. "This experience has taught us that high-frequency satellite surveys for operational forest monitoring are required for adequate forest management. With survey gaps of more than six months, forest degradation becomes difficult to detect, and authorities need up-to-date information to target ground surveys. The need for regular information is clearly there - countries without operational forest monitoring programmes will be refused entry to the REDD+ process."

Since 2005 DMCii has been providing regular multi-temporal coverage of the Amazon basin, focusing on areas most at risk. Brazil's National Institute for Space Research (INPE) uses the results to identify changes in forest cover, both to calculate the rate of deforestation and also to provide early warnings of illegal clearances which Brazil's forest agency, the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), can then investigate on the ground.

DMCii is also supporting the European Commission's Global Monitoring for Environment and Security (GMES) Africa initiative to map all of sub-Saharan Africa during 2010, including the dense, rarely-charted forests of the Congo Basin, the world's second largest rainforest ecosystem after the Amazon basin.

Finally DMCii is leading a team including the University of Leicester and the World Resources Institute to combine satellite imagery with other data sources to produce reliable maps and statistics of forest cover changes across Indonesia. The archipelago nation's forests represent a particularly challenging subject for mapping because they are distributed across many islands, and plagued by peat fires whose smoke can obscure wide areas of territory in the same manner as clouds.

