

## SERVIR and LAND COVER

**Land Cover.** Forests and other vegetated ecosystems are an important carbon sink and maintaining these ecosystems is critical for avoiding greenhouse gas emissions that contribute to climate change. But the human impact on forests has been profound—forests are shrinking due to population pressures, urban expansion, the need for fuel, and conversion to agriculture. Today, deforestation accounts for 17% of global greenhouse gas emissions. SERVIR's global partners help local officials monitor land use and land cover so they can more effectively manage them.

**SERVIR connects** space to village by making geospatial information, including Earth observation data from satellites, Geographic Information Systems, and predictive models useful to developing countries. SERVIR is a joint development initiative of NASA and USAID, working in partnership with leading regional organizations around the globe. SERVIR helps those most in need of tools for managing climate risks and land use.

SERVIR global hubs include:

- SERVIR-Eastern and Southern Africa, hosted by the Regional Centre for Mapping of Resources for Development (RCMRD)
- SERVIR-Himalaya, hosted by the International Centre for Integrated Mountain Development (ICIMOD)
- SERVIR-Mekong, hosted by the Asian Disaster Preparedness Center (ADPC). Launched October 2014.



Forest Fire Detection and Monitoring Tool map of Nepal.

### SERVIR places

science in the service of society by building the technical capacities of regional organizations with an established track record of working with governments and communities to apply geospatial tools at the local and regional levels. Through the SERVIR network, experts at SERVIR regional hubs partner with local decision-makers and local and US-based scientists to create new datasets, maps, and decision-support tools that answer critical development questions. SERVIR hubs also provide training to build capacity in local institutions for evidence-based decision-making to meet societal needs.



JULIES HENZE

### Managing Forests and Ground Cover

#### Detecting and Monitoring Forest Fires

Forest fires have become an environmental concern in recent years in the Hindu Kush-Himalayan region, posing a threat to human life and property and also to the area's natural environment. During a recent dry season in Nepal, wildfires destroyed vast hectares of forest. Through SERVIR-Himalaya, data from NASA satellites are helping Nepalese officials detect and monitor forest fires, research fire patterns, and assess damage in burnt areas. A new fire-alert system developed by ICIMOD sends out email or text messages within 20 minutes of detecting a fire, so area fire officials can mobilize fire-suppression efforts and warn villagers of impending danger. A similar system will soon be introduced in Bhutan and Bangladesh.

In Guatemala, millions of hectares of forest were destroyed by wildfires in recent years. To address this, SERVIR-Mesoamerica, in collaboration with CATHALAC a former SERVIR hub, set up a fire-management system as a pilot project to help Guatemala prevent and control wildfires using satellite data. With assistance from SERVIR-Mesoamerica, Guatemala's National Council of Protected Areas (CONAP) developed historic time-series data and a fire-forecasting system for the country.

### **Monitoring Land Cover and Use**

Bhutan is experiencing developmental pressures, urban expansion, and increased demand for agricultural land. At Bhutan's request, SERVIR-Himalaya is working closely with local technicians to assess changes in land cover and land use to help conserve biodiversity, manage natural resources, and protect the environment. SERVIR-Himalaya offers Bhutan an integrated database and maps showing land cover changes over the past 30 years. These tools help guide development decision-making and policies in Bhutan, supporting more effective forest management and land use practices. Nepal is also using data from SERVIR-Himalaya to analyze how changes to land cover and deforestation levels impact that nation's greenhouse gas emissions. This knowledge will help Bhutan and Nepal more effectively balance the human needs for development and agriculture with responsible forestry and biodiversity management.

Botswana, Malawi, Namibia, Rwanda, Tanzania, and Zambia are collaborating with SERVIR-Eastern and Southern Africa, the United Nations Framework Convention on Climate Change (UNFCCC), and the US Environmental Protection Agency to quantify changes in land use and cover over the past twenty years. The project has generated maps that integrate satellite data with ancillary data such as an agricultural census, land use surveys, and forest maps. The collaboration will enable these countries to produce high-quality greenhouse gas emissions inventories and build their ability to update these inventories in the future.

### **Using REDD+ for Sustainable Forest Management**

Many RCMRD member countries are developing strategies for REDD+ (Reducing Emissions from

Deforestation and Forest Degradation). REDD+ encourages nations to implement practices that conserve and sustainably manage their forests, and reduce greenhouse gas emissions caused by deforestation and forest degradation. But to implement REDD+ strategies, they need information such as the extent of their forest area, the rate of deforestation, and the carbon amounts associated with these losses. These countries also need support in assessing the most promising approaches for reducing emissions and identifying policy options that hold the greatest potential. A SERVIR project is using Earth observation science and technology to help nations produce forest carbon assessments and conservation strategies, and is generating cost-effective monitoring tools to track the progress of conservation efforts.

In the Mesoamerican region, forest clearing and degradation are widespread, and the region lacks adequate land cover data and deforestation-risk maps. REDD+ policy makers need current, fine-scale spatial data on forest cover change and decision-support tools to target future REDD+ policies and evaluate their efficacy. A SERVIR project will help generate products to measure land cover change from 2000-2015 and produce maps displaying the risk of deforestation. The project will create an online decision-support tool to guide future REDD+ policies and a methodology to evaluate the impacts of these policies on deforestation and climate change.

**SERVIR strengthens** the ability of governments and other development stakeholders to incorporate Earth observations and geospatial technologies to respond to natural disasters, improve food security, safeguard human health, manage water and natural resources. Improved management of natural resources also helps to identify opportunities to improve economic growth while lowering greenhouse gas emissions and building resilience to climate change.



**Protected areas in eastern Africa, as determined by SERVIR's Forest Carbon Assessment for REDD+ application.**

---

**FIND OUT MORE AT**  
**[www.servirglobal.net](http://www.servirglobal.net)**