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USAID FROM THE AMERICAN PEOPLE

SERVIR GLOBAL

NASA

SERVIR and EXTREME EVENTS

Extreme Events. Fire, flood, drought, and storms can devastate a region. Extreme events may not be preventable, but much can be done to reduce their negative impacts. SERVIR's global partners help local officials reduce risks by monitoring conditions, creating early-warning systems, preparing for eventualities, and visualizing damage when it occurs, to speed response.

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.

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.

ICIMOD

Managing Extreme Events

Forecasting Floods

SERVIR works with water resource managers at the river basin level to address risk management, vulnerability mapping, preparedness, conservation, and flood forecasting. Of particular importance is the Coupled Routing and Excess Storage Tool (CREST), a sophisticated hydrologic modeling tool. It integrates satellite rainfall information with land shape, elevation, soil characteristics, and other variables to calculate actual evaporation, transpiration, soil moisture, and streamflow. In eastern Africa, CREST covers watersheds with data from 850 stream gauge locations and enables water managers to assess imminent and near-term likelihood of flooding at selected locations. The system sends out daily email updates and a mobile app is under development. A CREST-based system has been developed for Kenya and will soon be available in Rwanda and Namibia.

In Kenya, the Department of Water Resources requested high-resolution maps of areas inundated as a result of flooding. In response, RCMRD's analysts created a mapping application to visualize the extent of flood damage. A SERVIR project is developing capabilities to monitor water resources availability in Tanzania, Ethiopia, and Zambia, and provide near-term

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streamflow forecasts in support of regional water resource management. This project will also develop a quantitative assessment of how climate change impacts these nations' water resources. Another SERVIR project uses satellite altimetry data to help Bangladeshi water resource managers produce 8-day flood forecasts, a great improvement over the 3-day forecasts possible before.

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 to the area's natural environment. During a recent dry season in Nepal, wildfires destroyed vast hectares of forests. 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 SERVIR 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.

CRAY TAPPAN, USAID

Assessing and Forecasting Landslides

DIGITALGLOBE

Rainfall-triggered landslides threaten life and property, killing thousands each year. In Latin America and the Caribbean, difficulties assessing rainfall-related triggers and a lack of information about potentially dangerous sites make it challenging to forecast landslides and reduce risk. A SERVIR project is developing a probabilistic landslide assessment and forecasting tool that integrates observed and satellite rainfall data to help local decision-makers identify susceptible areas and predict the timing of future landslides.

Predicting Drought

Recurring drought is a particular threat to the Greater Horn of Africa. Estimations of rainfall variations are key to drought early-warning and environmental monitoring. A SERVIR project has produced a continuous 30-year record of rainfall estimates for the region to assess large-scale rainfall patterns. This new and improved satellite-derived rainfall dataset will help local officials better correlate long-term rainfall with crop yields, and assess how these yields may be evolving as a result of climate change. Local officials can also use this data to predict and mitigate the impact of drought.

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.

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www.servirglobal.net