SERVIR: A Brief Overview

West Africa Regional Adaptation Workshop
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SERVIR

Enabling the use of earth observations and models for timely decision making to benefit society

- Data and Models
- Online Maps
- Visualizations
- Decision Support
- Training
- Partnerships

Flood Forecasting in Africa

Training and Capacity Building

Mapping Fires in Guatemala Mexico
SERVIR Network
SERVIR Applications

SERVIR Applications have several dependencies:

- NASA Applied Science Program
  Agriculture, climate, disasters, biodiversity, public health & air quality, and water resources

- GEO
  Agriculture, biodiversity, climate, disaster, ecosystems, and human health

- USAID
  Climate change adaptation, Terrestrial carbon assessment and GEO focus areas

- Regional Needs Assessment.
  Every science Application undertaken by SERVIR has to have a need identified.
SERVIR
Science and Applications Plan

- **Air quality**: Particulate Matter, Ozone modeling using AQ models coupled with mesoscale atmospheric models.

- **Agriculture**: SERVIR is collaborating with FEWS NET

- **Land cover**: Land cover classifications for forest and terrestrial carbon assessments

- **Climate**: Assess adaptations necessary to mitigate impacts of climate change

- **Cryosphere**: Accurate snow water equivalent assessments to better quantify snow melt and timings

- **Disasters**: Early warning for floods, forest fires and landslides. Droughts are of significant interest

- **Health assessments**: Estimation and early warning of Rift Valley Fever, Malaria, and other vector-borne diseases using streamflow and soil moisture as proxy

- **Water**: Water quantity and quality assessments
Fire forecasting uses MODIS Rapid Response System, a collaborative effort between GSFC and University of Maryland.
SERVIR Hydrologic Modeling

- Spatially distributed hydrologic model CREST (based on Variable Infiltration Capacity (VIC) model)
- Spatial resolution ~1km, run every 3 hours in near real time mode in the “Cloud”
- Uses near real-time satellite rainfall estimates from TRMM and forecasts from Kenya Meteorological Department (KMD) to produce soil moisture, evapotranspiration & streamflow
- Forecasted soil moisture, evapotranspiration and streamflow will enable KMD to issue early flood warning, especially in the flood prone watersheds in western Kenya.
Baseline Datasets

- Hydrologic observations do not exist in majority of the watersheds in the KMD domain.

- We have using a Global Reanalysis datasets (1949 – 2009), at refined scale using NASA Land Information System (LIS)

- These historic long-term data will provide the historic perspective to the near real time model estimates and to quantify hydrologic extremes including floods and drought
Land Cover and Land Cover Change

• SERVIR-East Africa is participating in a USEPA project to quantify land use change and greenhouse gas inventory in east Africa. USFS has initiated planning for Himalayan region.

• In the long term, SERVIR-East Africa would like to link land use land cover change to hydrologic assessments. These inventories, and future land cover scenarios will bring improvements in the hydrologic assessments and will also enable the end users in the region with quantitative information to better prepare for adaptation.
SERVIR Web Portal

East Africa - Geospatial Catalog

SERVIR’s Geospatial Catalog provides a means to discover and access geospatial data and associated information products and services. Search for layers with the East Africa Catalog. If you are looking for layers from another SERVIR region, please go to the hosting page for those catalog (Menawar, 2013).

Select layer attributes to limit search results (the default is all layers).

Select data and results from the search. Select the option to limit search results to display only the selected layers.

Layers & Services options button:

- layers and services
- search
- apply to

Select data and results from the search. Select the option to limit search results to display only the selected layers.

Additional options:

- search
- layers and services
- apply to

East Africa - Interactive Web Maps

The SERVIR Web Map allows you to access and display data or information from several external sources to create a new service. Using the Web Map interface, you can choose specific data sets and information products by type and detail, display them on a basic map, and further manipulate them for analysis.

Please note: If a layer in the Interactive Web Map will not load properly, then it’s likely that there are service issues with the Web Map Server (WMS) on the third-party provider’s server. We are working on ways to improve our ability to address issues with our third-party providers’ services as they arise. Please report any issues via the feedback link. Thank you for your patience.

— The SERVIR team
In a Nutshell…

• SERVIR is a joint USAID – NASA effort, which uses remotely sensed data and products for societal benefit.

• SERVIR currently has three hubs, in Central America, East Africa and Himalaya.

• Science Applications, IT infrastructure and capacity building is central to SERVIR efforts.

• Collaborations are key. SERVIR is continuing to develop strong, working collaborations with government entities in the region, such as KMD.
Backup
SERVIR is putting together a plan to develop three temporal slices of land cover maps over a region in east Africa using medium resolution (30m Landsat multi-spectral imagery).

Plan includes training ground sampling crew for collection of validation data and training the in-country technicians in land cover classification and assimilation of validation data.

SERVIR will perform quality assessment and accuracy assessment quantification.

This assessment will also enable linking and quantifying changes to the hydrologic regime.
Assimilating Remotely Sensed Streamflow in Modeled Estimates

- Later this year, we plan to assimilate microwave-based streamflow estimates (TRMM and AMSR-E) into the CREST model.

- Spatial resolution of the microwave products will be coarser, but will provide a temporal signal of statistical significance, which will result in improved initializations for the forecast runs.

- Additional data and methods for assimilation are valuable, and will provide improved forecasts.
SERVIR @ CATHALAC
City of Knowledge, Panama

Inaugurated on February 3, 2005
SERVIR-Africa @ RCMRD
Nairobi, Kenya

Inaugurated on
November 21, 2008
SERVIR-Himalaya @ ICIMOD
Kathmandu, Nepal

Inaugurated on October 5, 2010