SERVIR
Connecting Space to Village

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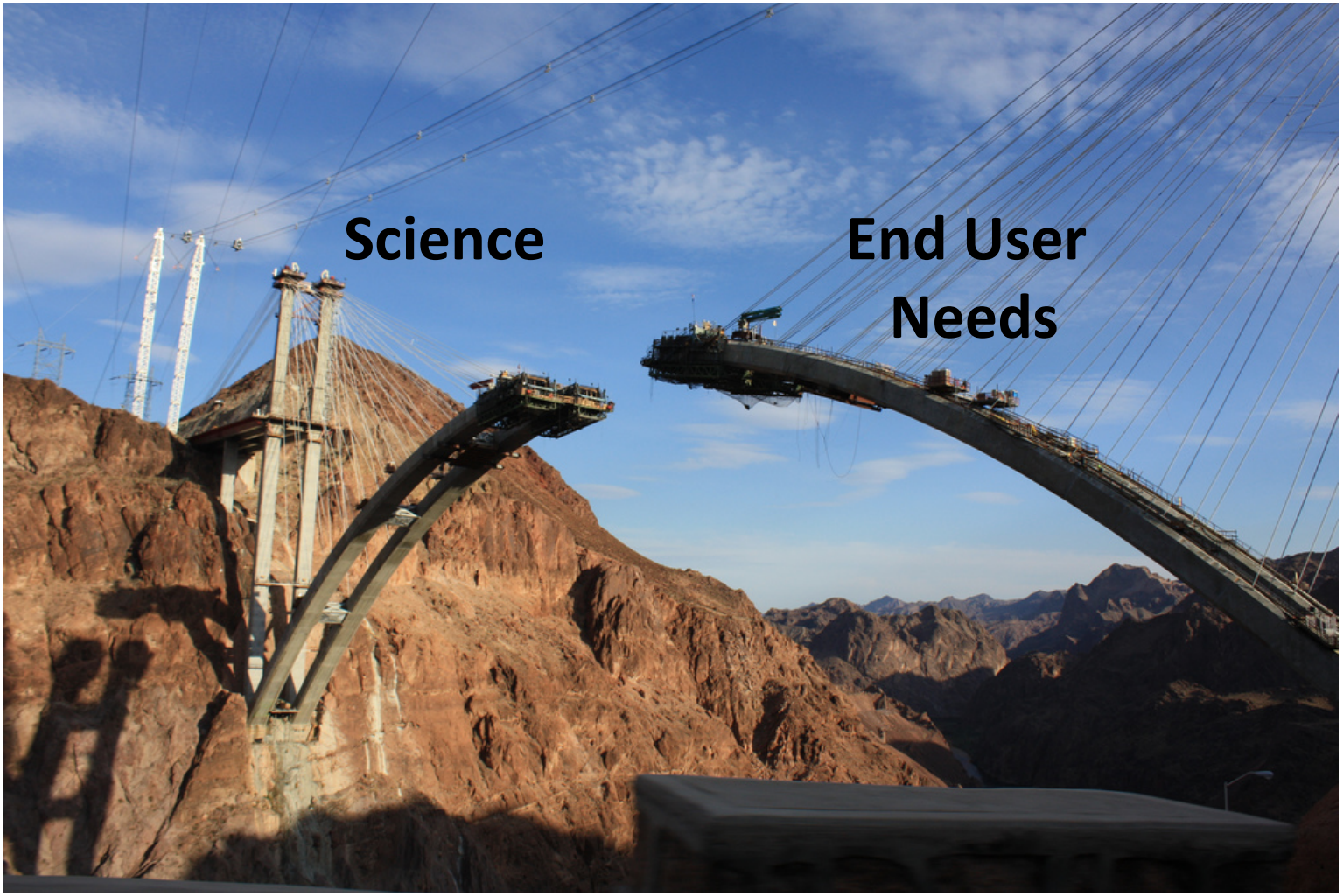
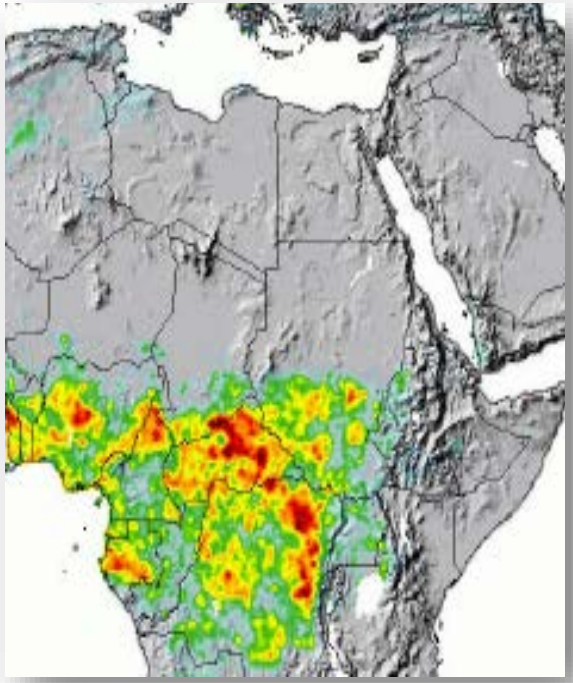
Linking Science to End User Needs



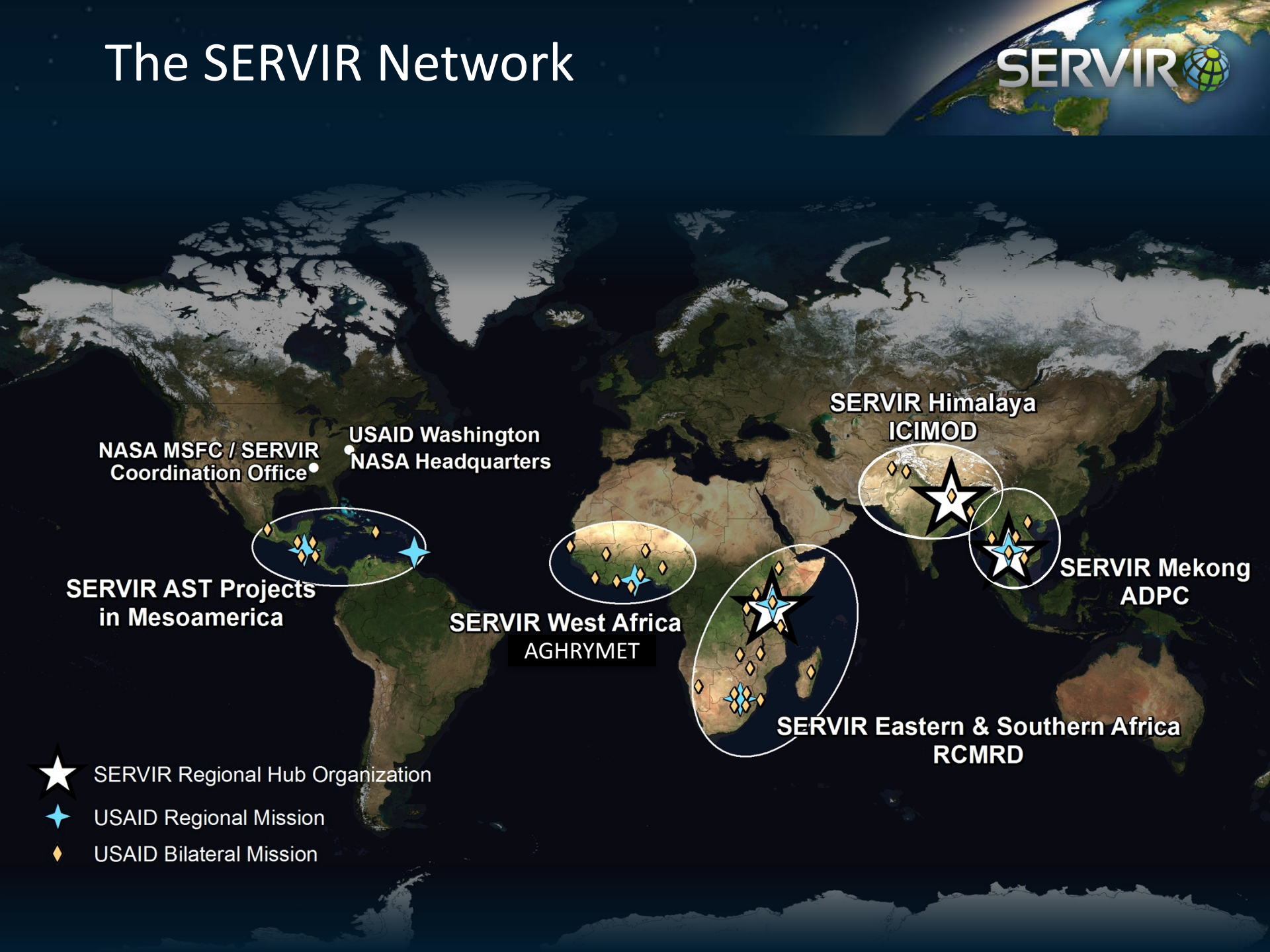
Courtesy: alifayre

What We Do

- Identify needs in SERVIR regions
- Link science products from research institutions to meet those needs through improved access to data, models, online maps, and visualizations
- Build capacity of regional institutions, stakeholders, and young professionals
- Strengthen partnerships and foster collaboration across SERVIR network



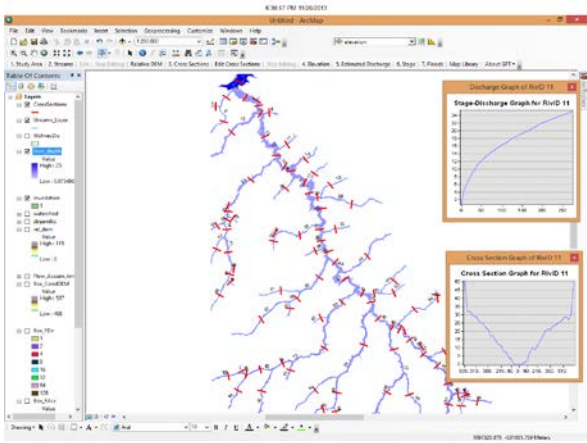
The SERVIR Network



Flood Mapping Tool

At the request of Kenya Department of Water Resources, RCMRD developed this tool to visualize hydrologic model products. The tool enables identification of areas under flood inundation risk.

Inputs	• Streamflow- data (outputs from CREST model) • High resolution DEM • Streamflow rating curves (can be derived from high-res DEM data)
Outputs	• Trainings for capacity building • Flood mapping tool integrated with CREST model • Inundation maps-flood extent maps for specific basins
Outcomes	• Increased capacity in flood management agencies on use of flood tool for decision making. • Integration of flood early warning information in decision making to reduce impacts of flooding. • Mitigation measures to avert effects of flooding
Impact	Reduced damage to property and loss of lives due to floods
End Users	Officers in Ministries of Water, Disaster management agencies in Kenya, Uganda, Rwanda and Namibia



Hydrologic Modeling System for Himalayas

At the request of the end users, SERVIR Coordination Office and ICIMOD, and AST PI Faisal Hossain have put together a suite of hydrologic model products in Indus, Ganges, and Brahmaputra river basins.

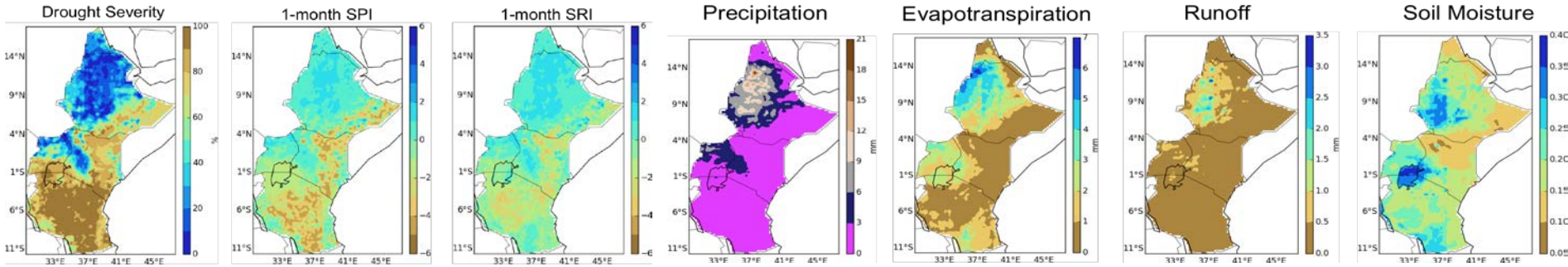
Inputs	• Satellite-derived rainfall • Temperature • DEM
Outputs	• Streamflow along the three rivers and tributaries • Soil moisture for realistic crop and flood forecast assessments • Seasonal forecast of streamflow (coming soon) for seasonal water resources planning • Training sessions for hydro meteorological agencies
Outcomes	• Increased capacity in hydromet agencies on use of real time streamflow data for decision making. • Real time streamflow data for mitigation measures
Impact	Effective water resource management due to availability of a cohesive, multi-national water resources perspective.
End Users	Officers in Ministries of Water in Bangladesh, Nepal, Pakistan, and Bhutan

Drought and Agricultural Productivity Assessment and Prediction System

Susceptibility Map

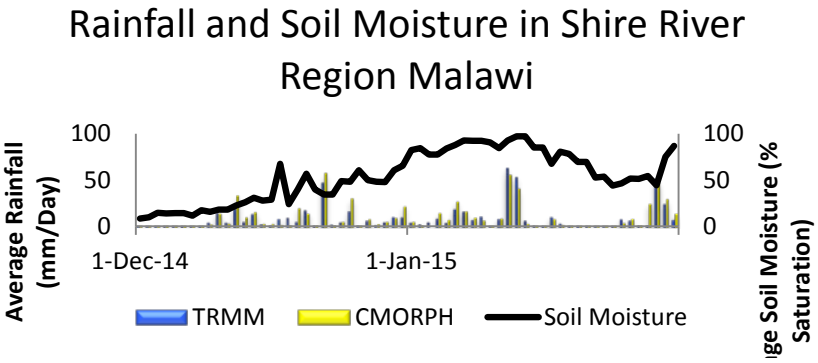
- In East Africa, forecasts of end of season crop production estimates are critical. Collaborations with Ministries of Agriculture in Kenya, Ethiopia and Tanzania have shown that reliable crop productivity assessment tools are critical to effectively address food security challenges.
- **Goal is to enable ministries of agriculture to access water availability and crop productivity nowcasts and forecasts using the best available ground and satellite-based data through a coupled hydrologic - crop productivity model suite RHEAS. Linking with seasonal rainfall forecast enables actionable seasonal crop outlook**
- Ground validation has proven effective capture of the crop yield trends. SERVIR has trained scientists from Kenya, Ethiopia, Zambia, and Uganda to use the system.
- The open-source system is now being run at RCMRD and is used to assess crop yield to support Agriculture ministry's extension officers.

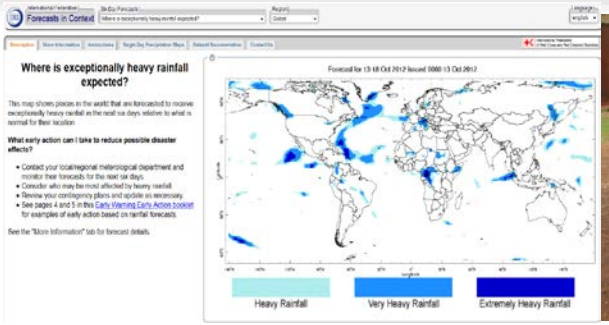
Hydrologic outputs from RHEAS

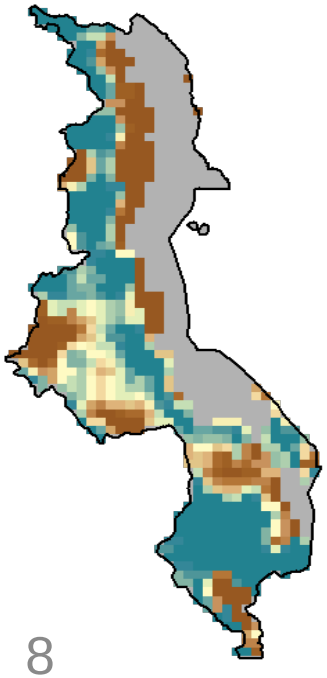


Maps of drought products during the last major drought in 2011

Analyzing Flood Risks in Malawi







Helping International Red Cross in Malawi to:

- Forecast extreme events
- Map soil moisture
- Map riverine and flash floods
- Analyze risks

NMME-based Seasonal Forecasts of Rainfall and Temperature

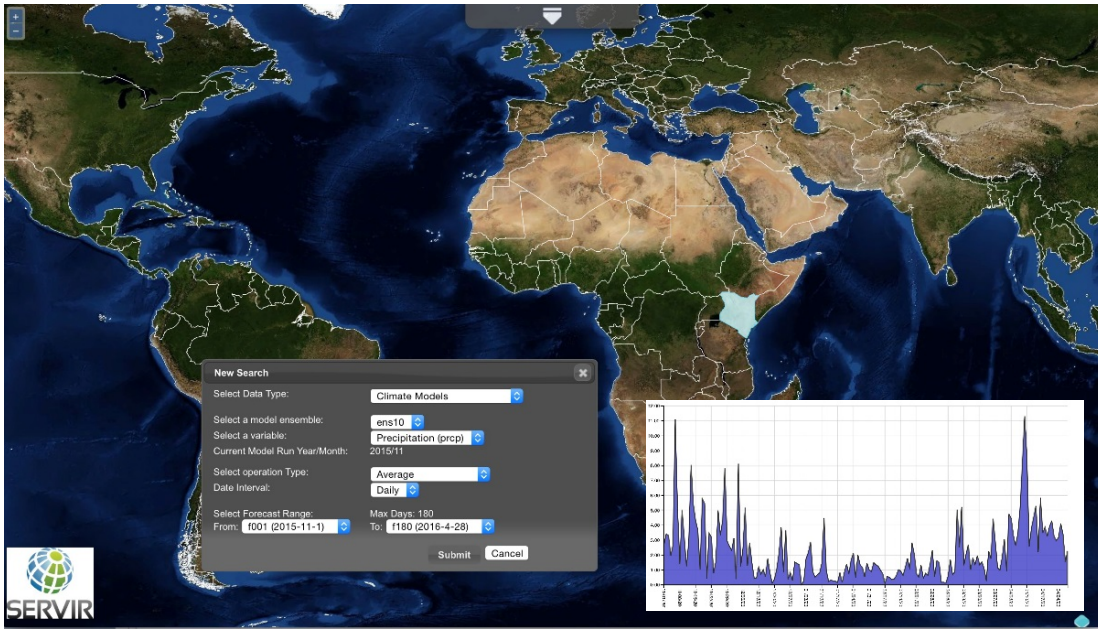
The problem: SERVIR end users need an efficient way to access seasonal climate forecasts and daily scenarios for decision making in water resources and agricultural crop estimation.

What we did: Bias-corrected and spatially disaggregated (BCSD) seasonal projections based on North American Multi-model Ensemble (NMME) experimental forecasts. The SERVIR Science Coordination Office makes spatially downscaled 180-day projections available to SERVIR users on an easy-to-use web-system: *100+ ensemble members (9 NMME models) are bias corrected over the 180-day periods. Statistical disaggregation using a historical analogue approach (Wood et al; 2002) provides daily-resolution stochastic realizations consistent with NMME monthly forecasts.*

Output:

- Climate projections
- 180 days in extent
- updated monthly
- Resolution: 0.5°global grid, daily
- Variables: Rainfall, Temperature

Significance: SERVIR end users in Himalaya and Eastern Africa have started to use the ensembles to generate hydrologic and seasonal crop assessments.



http://ClimateSERV.nsstc.nasa.gov

Product Catalogue

SERVIRcatalog.net / SERVIRcatalogue.net

Summary

- SERVIR is a link between research institutions and end user decision making in developing countries.

- SERVIR efforts are led by the needs of the region. Some examples include flood mapping and coupled crop and hydrologic modeling.

- Presence of SERVIR Hub, a technical institution with regional governmental support, makes the linkage sustainable.