SERVIR Africa

CREST Hydrological Modeling for Water Resource and Flood Risk Management

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• Regional Center for Mapping of Resources for Development (RCMRD) is a regional technical organization supporting 19 member states in Eastern and Southern Africa.

• It provides advisory, project implementation, training and capacity building support to the member states.

  • In 2008 RCMRD partnered with USAID and NASA to implement SERVIR – Africa.

• The objective is to strengthen the capacity of governments and other key stakeholders to integrate Earth observations into developmental decision making through provision of data and models, online maps, visualization, and partnership building.

• SERVIR-Africa has developed a water resource assessment capability at RCMRD in collaboration with NASA Goddard Space Flight Center and University of Oklahoma.
Flooding are among the most catastrophic disasters in East Africa. Several countries lack real-time information on streamflow, the amount of water in the rivers.

- SERVIR-Africa has collaborated with Kenya Meteorological Services (KMS) to run a distributed hydrologic model, CREST, for a large domain in East Africa using NASA near real-time rainfall data and KMS’s rainfall forecasts.

- In collaboration with the Department of Water Resources in Kenya, SERVIR-Africa monitors CREST model output at 850 river locations in near real time. The automated CREST model post-processing system sends daily streamflow data to the Department personnel.

- SERVIR-Africa has also generated 10-year CREST model runs using available historical satellite rainfall data. The result is a climatology of daily, 1km resolution streamflow for past 10 years.

- The historical data enables SERVIR-Africa to evaluate current streamflow condition in historical context. For example, if current streamflow level was not seen in past 10 years of streamflow records, SERVIR-Africa data processing system flags the station as “very wet”, and an email alert is automatically sent to the Ministry personnel.
Water Resources & Flood Risk Management

- Department of Water Resources is concerned with the quantity of water resources in the country and their temporal and spatial variation under changing climate conditions.

- Floods are a major catastrophic disaster impacting human lives, food and agricultural security, human health, infrastructure, tourism, and other sectors.

With SERVIR – Africa CREST model, Department of Water Resources is able to:

- Fill in missing data in stream flow time series using CREST historical runs.
- Monitor remote rivers for potential flooding situations.
- Monitor and estimate the extent of floods.
- Estimate streamflow for sites where the hydrological measuring devices have been destroyed or vandalized.
- Generate flows when no funds are available to construct a gauging station.

DWR has demonstrated the utility of CREST model products to other entities within the Kenyan government, such as the Water Resource Management Authority (WRMA). Their District officers use CREST products to keep track of rivers in their jurisdiction for issuance of water abstraction permits.
Thank You

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