Table 1: SERVIR-Africa components, objectives, and initial activities.

<table>
<thead>
<tr>
<th>Component</th>
<th>Objective</th>
<th>Activities (2008-2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs assessment</td>
<td>Understanding of current and anticipated needs for data and information services</td>
<td>• Requirements specification workshops</td>
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<td></td>
<td>Better linkages between earth observation initiatives underway in Africa</td>
<td>• Acquisition, testing, and configuration of computer hardware &amp; software at RCMRD</td>
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<td></td>
<td>More grounded awareness of how data/services are used in practice</td>
<td>• Documentation and access to RCMRD data via portal (one-stop discovery system)</td>
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<tr>
<td></td>
<td>(socio-political-technical realities and limitations)</td>
<td>• Incorporation of additional data (not yet in RCMRD holdings) into SERVIR system</td>
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<td>(e.g., MODIS, TRMM, STRM 30m derivatives, etc.)</td>
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<tr>
<td></td>
<td></td>
<td>• Registry of existing African geospatial web services (catalog, map services)</td>
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<tr>
<td>Regional system implementation</td>
<td>Increased access to and use of earth observation data (and field-based data)</td>
<td>• Development and maintenance of SERVIR-Africa website</td>
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<td></td>
<td>Development of demand-driven data products/services (derived from earth observation data); routine delivery of data products/services</td>
<td>• Development of demand-driven data products/services (derived from earth observation data); routine delivery of data products/services</td>
</tr>
<tr>
<td>Technical support</td>
<td>Strong linkages between Mesoamerica and East African system (“south-south exchange”)</td>
<td>• Flood potential and forecast mapping and Rift Valley Fever risk mapping</td>
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<td></td>
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<td>• TerraLook upgrade</td>
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<td></td>
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<td>• 3D climate change visualization tool (Climate Mapper)</td>
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<td>• Climate change impacts on biodiversity decision support application</td>
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<td>• Coral reef monitoring application</td>
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<td></td>
<td></td>
<td>• Public domain roads dataset pilot (automatic feature extraction, ASTER)</td>
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<tr>
<td>Training</td>
<td>User community actively drawing upon earth observation resources, developing new services and applications</td>
<td>• Metadata &amp; map service training</td>
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<td></td>
<td>Strengthening of university curricula and embedding SERVIR capabilities into university training</td>
<td>• University course on earth observation &amp; spatial data infrastructure</td>
</tr>
<tr>
<td>Governance and financial sustainability</td>
<td>Regional ownership of SERVIR and viable strategy for continuing activities well into the future</td>
<td>• Course on rapid land cover mapping</td>
</tr>
<tr>
<td>Communications/ outreach</td>
<td>Wide base of users/partners engaged in SERVIR-Africa</td>
<td>• MyCOE-SERVIR biodiversity research initiative</td>
</tr>
</tbody>
</table>

**SERVIR-Africa collaborators**

**evolving network of partners**

**Implementing agencies**

- [SERVIR](http://www.servir.net)
- [RCMRD](http://www.rcmrd.org)
- [CATHALAC](http://www.cathalac.org)
- [NASA](http://www.nasa.gov/servir)
- [USAID](http://www.usaid.gov)
- [GEO](http://www.earthobservations.org)

**Government agencies**

- [USGS](http://www.usgs.gov)
- [KMD](http://www.kmd.gov)
- [UNEP](http://www.unep.org)
- [AAG](http://www.aag.org)
- [GSDI](http://www.gdsi.org)
- [JACOB](http://www.jacobs.com)
- [ESTS Group](http://www.estsgroup.com)

**Universities**

- [AIST](http://www.aist.gov)
- [COLE](http://www.cole.org)
- [AGI](http://www.agi.org)
- [Collab](http://www.collab.org)
- [USRA](http://www.usra.org)

**Business/industry**

- [AAG](http://www.aag.org)
- [GSDI](http://www.gdsi.org)
- [JACOB](http://www.jacobs.com)
- [ESTS Group](http://www.estsgroup.com)

**Links**

- [SERVIR](http://www.servir.net)
- [RCMRD](http://www.rcmrd.org)
- [CATHALAC](http://www.cathalac.org)
- [NASA](http://www.nasa.gov/servir)
- [USAID](http://www.usaid.gov)
- [GEO](http://www.earthobservations.org)

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SERVIR-Africa: south-south geospatial collaboration in action

Introduction

SERVIR integrates satellite observations and predictive models with other geographic information (sensor and field-based) to monitor and forecast ecological changes and respond to natural disasters. This evolving regional visualization and monitoring platform is being established in Africa to improve scientific knowledge and decision-making in a range of application areas (e.g., biodiversity conservation, disaster management, agricultural development, climate change adaptation, etc.). Initial work covers flood potential modeling, flood forecasting, and Rift Valley Fever risk mapping.

Established in 1975, RCMRD is a long-standing focal point for building capacity in surveying and mapping, remote sensing, geographic information systems, and natural resources assessment and management. The Center is supported by its 15 contracting member states: Botswana, Comoros, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Namibia, Somalia, South Africa, Sudan, Swaziland, Tanzania, Uganda, and Zambia. With approximately 50 staff members, the Center trains 400-500 people per year. It also implements projects on behalf of its member States and development partners. The Center currently has an antenna to receive data and derived products from the Advanced Synthetic Aperture Radar (ASAR) and the MEDium Resolution Imaging Spectrometer (MERIS) sensors, and a separate GEONETCast antenna also has been installed to receive additional earth observation products. The Center has been active in spatial data infrastructure development in Africa through its contributions to initiatives such as the African Geodetic Reference Frame (AFREF), Mapping Africa for Africa (MAFA), and SIDI-Africa.

SERVIR-Africa Implementation

Implementation is grouped into six components: needs assessments, regional system implementation, technical support, training, governance and financial sustainability, and communications/outreach (see Table 1). Scientists and technical staff from CATHALAC and RCMRD are jointly developing the system, making SERVIR a strong example of south-south, cross-continental geospatial collaboration.

Equipment procurement and system installation for the initial setup for the SERVIR-East Africa has been completed. CATHALAC and RCMRD together identified equipment, prepared rooms for the equipment at RCMRD, configured and installed equipment, and developed a security and back-up plan. The hardware for the initial setup is comprised of three high-end servers (for web site, applications, and serving geospatial information), a disk array to store the geospatial datasets (raster and vector), a switching system to connect the servers, a firewall, an uninterrupted power supply, and a rack mount. This hardware configuration is based on the experience of SERVIR implementation in Central America. It is fully scalable so that the system can be expanded as the initiative progresses. The portal, now under development, will provide searchable and viewable earth observation data, animations, and decision-support tools.

Approach

SERVIR-Africa will have the following core functions:

- Integration of earth observation and other geosciences products in regional decision support systems that address areas of societal benefit,
- GIS product analysis and application development,
- Integration of national datasets (e.g. in situ, national maps, etc.),
- Training and capacity building to scientists and researchers, government and other key decision makers, students, and the media,
- Community building among strategic sectors,
- Data archiving and distribution to enable full and open access to SERVIR regional and national geospatial datasets.

Initially, SERVIR-Africa is placing emphasis on establishing a geospatial portal to provide searchable and viewable earth observation data, geospatial services, data documentation (metadata), animations, visualization, analysis and reports. The architecture will be open to allow SERVIR data to be available as web services to other applications. Social networking enhancements will be incorporated to enable commenting on and ranking of content in the portal, community linking of multimedia materials to locations, and interaction of researchers to find one another and collaborate directly. The portal will be operational in 2009.

Early highlights

SERVIR has released a beta version of the SERVIR Climate Mapper tool. The Climate Mapper is a plugin for SERVIR-Viz, a customized version of WorldWind, NASA’s free, open-source, web-enabled, 3D earth exploration tool. Using the Climate Mapper plug-in, users can zoom into specific areas within Africa and view summarized data in the form of charts and graphs. Climate data are stored on the user’s hard drive and do not require a high-speed internet connection.

Taking advantage of NASA’s recent decision to allow end users to submit task requests for the EO-1 satellite, SERVIR made arrangements so that RCMRD and CATHALAC can acquire Hyperion and ALI data for specific locations, upon request. Their requests are ranked against multiple criteria. Every day, the EO-1 system picks one or more of the highest-ranking scenes for imaging. For recent flooding in East Africa, RCMRD submitted requests which triggered the tasking process, and the data were delivered to RCMRD—demonstrating that this capability now is operational.

SERVIR-Africa is steadily making progress on its flood mapping application. Using data from multiple NASA missions/sensors (SRTM, AMSR-E, TRMM, MODIS) and adapting existing NASA models, a prototype flood potential product has been developed. RCMRD currently is evaluating the product, as well as preparing post-event flood maps with near-real time MODIS data.

About RCMRD

Within two years of SERVIR’s initiation, the Group on Earth Observation (GEO), a partnership of governments and international organizations seeking to connect users to existing databases and portals to better exploit the growing potential of Earth observations, recognized SERVIR an early achievement of GEO’s vision.

Given SERVIR’s promising approach, the United States Agency for International Development (USAID) provided support to NASA to extend SERVIR’s geographic coverage to Africa. In 2008, NASA and CATHALAC partnered with the Regional Center for Mapping of Resources for Development (RCMRD) based in Nairobi, Kenya, and together they began setting up SERVIR’s East Africa node. The SERVIR-Africa project is building upon RCMRD’s existing strengths, and augmenting RCMRD’s data management and training capabilities. Efforts complement RCMRD’s core mission and provide a springboard for the development of applications customized for RCMRD’s member states.

Figure 1. Alexis Garcia (CATHALAC) and Lawrence Olokis (RCMRD) jointly install SERVIR equipment.

Figure 2. Francisco Delgado (CATHALAC) leads expertise in geospatial web services development to RCMRD staff.

Figure 3. Climate Mapper, a plugin for SERVIR’s customized version of NASA’s WorldWind.