The SERVIR Program: using geospatial information to enable climate-resilient decisions in the developing world

Ashutosh Limaye, Eric Anderson, Africa Flores, and Dan Irwin

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Science Applications

Our science applications use high-tech satellite data and predictive models to develop visualization tools for addressing environmental issues within hub regions. We consult and partner with prospective users to ensure that applications are tailored to their needs and priorities. This user-engaged, hands-on approach to developing science applications enables us to apply global technology at the grass roots level in the manner most beneficial to each region. This section of the website provides information about each SERVIR application, organized according to eight areas of societal benefit identified by the Group on Earth Observations (agriculture, biodiversity, climate, disasters, ecosystems, health, water, weather).

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Water Resources Assessment and Forecasting Tool
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Information on soil moisture, evapotranspiration, and streamflow is key to assessing water resources. To provide this information in East
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30-meter Resolution Land Cover Data Set for East Africa
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SERVIR is producing land cover maps (for 2000, 2005, and 2010) for six African countries (Malawi, Zambia, Rwanda, Tanzania, Botswana, and
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Historical Changes in Snow Cover in Hindu Kush Himalaya
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This SERVIR application provides interactive snow cover mapping in Himalaya along with major basin and sub-basins statistics important for
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Himalaya MODIS Land Cover Maps
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MODIS-based land cover data sets (land cover maps, land cover change maps, and vegetation status maps) help the land and forest ministries
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East Africa MODIS Land Cover Maps
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Latin America and the Caribbean: Atlas of Our Changing Environment
3/28/2012
This atlas represents the first regional effort to analyze the changes taking place in the Mesoamerican environment, combining precise and
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Biodiversity

Resource Inventory and Assessment of Phobikha Wetland Ecosystem
4/01/2012
The application provides important information and a basis for management zoning of the valley for conservation efforts. It has been
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Land Cover Dynamics in Bhutan
3/30/2012
This tool facilitates land cover assessment and monitoring of land cover dynamics, which are essential for environmental protection,
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Climate

Scenario-based Climate Change Impact on Water Availability and Hydrologic Flows in the Wangchu Basin of Bhutan
4/01/2012
Water security is a major concern related to climate change. This SERVIR application uses a distributed hydrological model called CREST
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Disasters

SERVIR publishes CEMEC's Weekly Fire Monitoring Reports
4/19/2012
The department of Petén is the most forested area in Guatemala. In fact, northern Petén adjoins patches of forest in neighboring Mexico and
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SERVIR training in East Africa to help in assessing water resources
4/16/2012
Twenty-one people from 13 countries, including many East African countries as well as Bhutan and Nepal, participated in a hydrological
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Ecosystems

Resource Inventory and Assessment of Phobikha Wetland Ecosystem
4/01/2012
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Health

Mapping Haze as Indicator of Air Quality in Bhutan

SERVIR to conduct remote sensing training at Mexico's University of

Interactive Mapper

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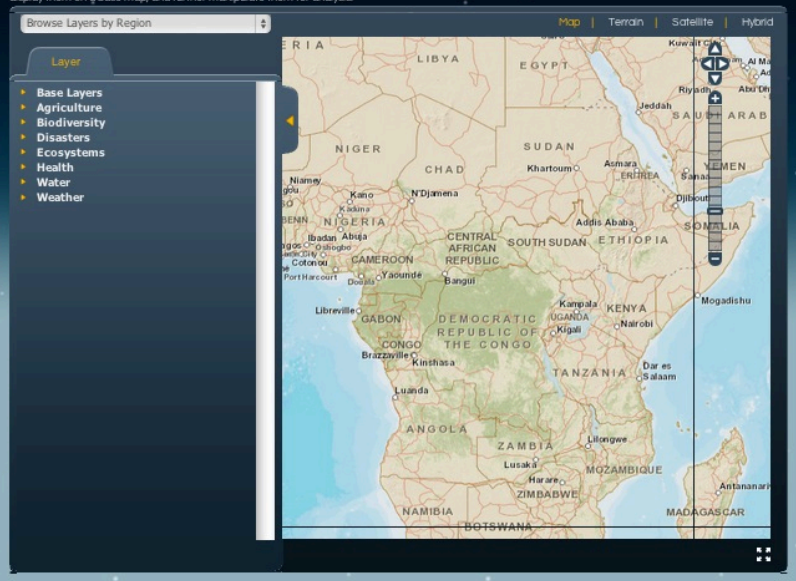

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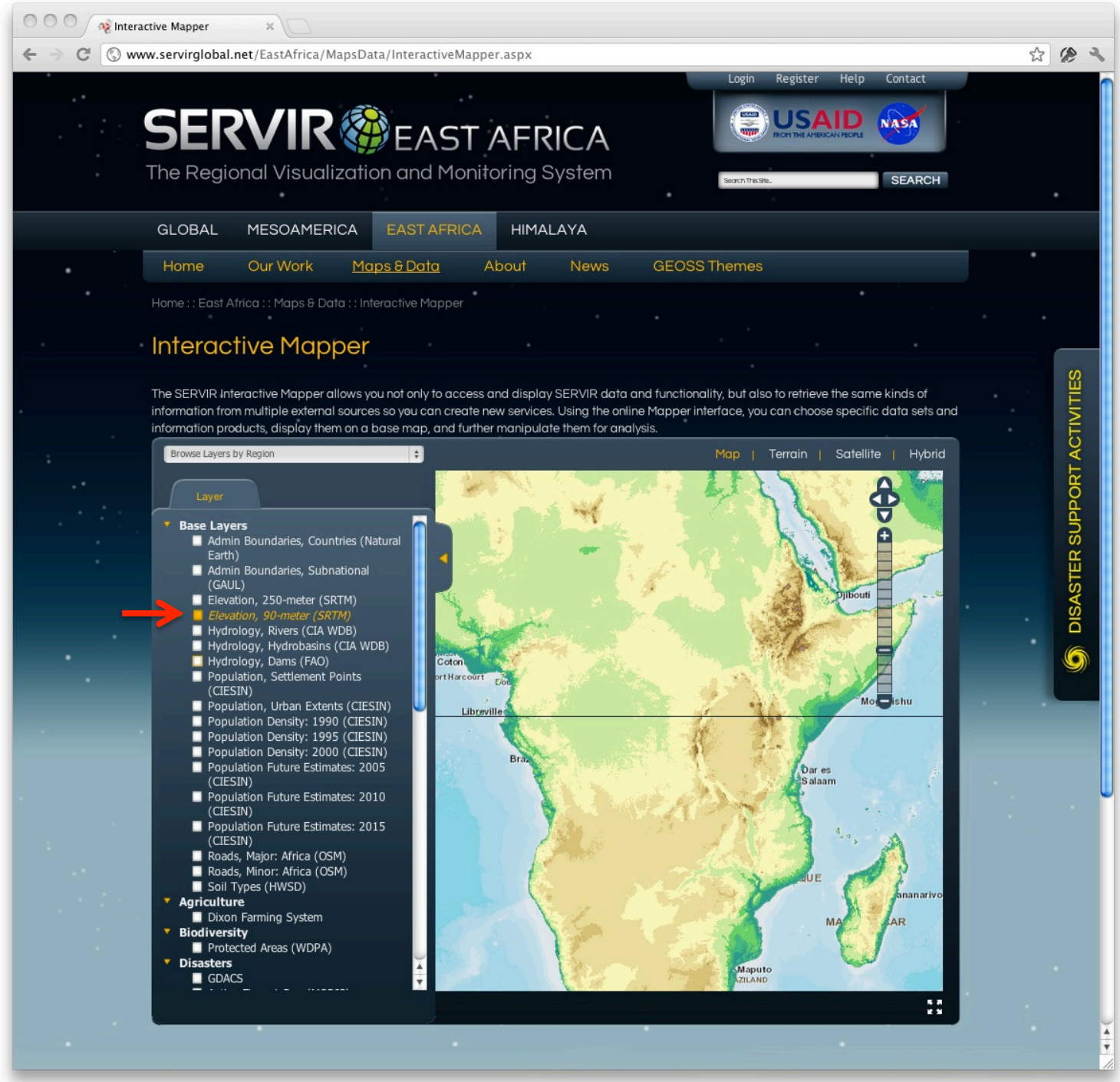
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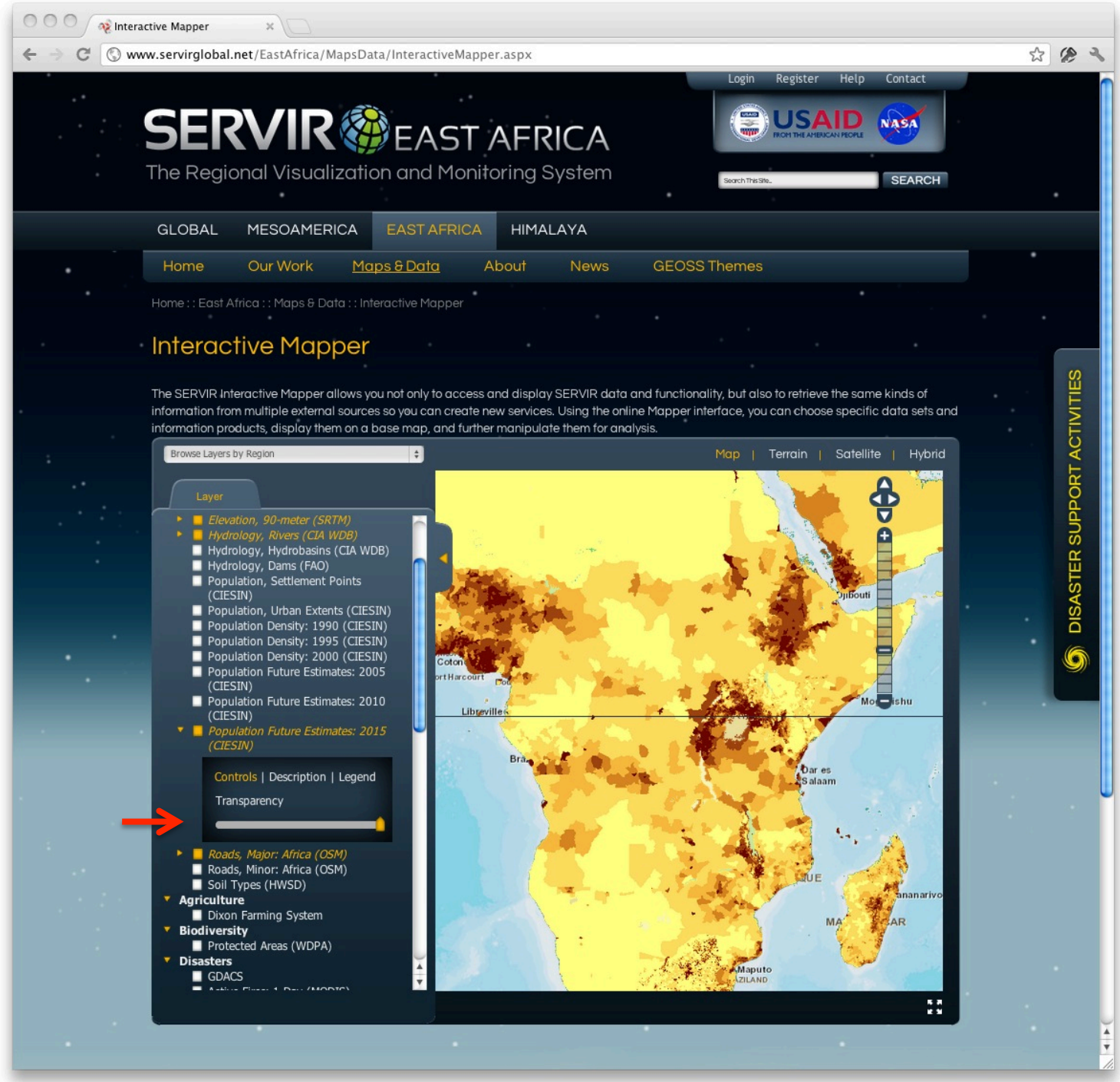
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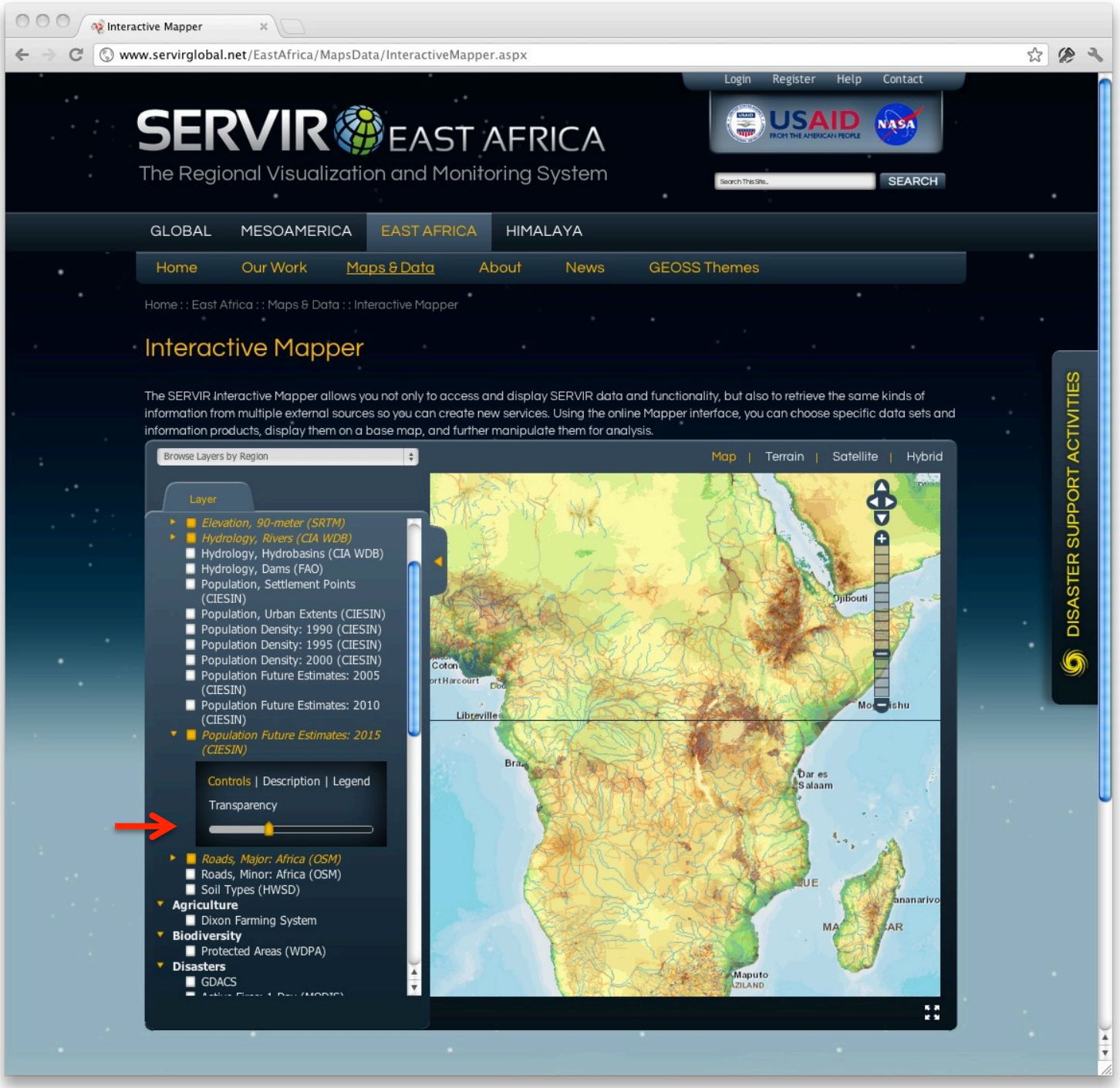
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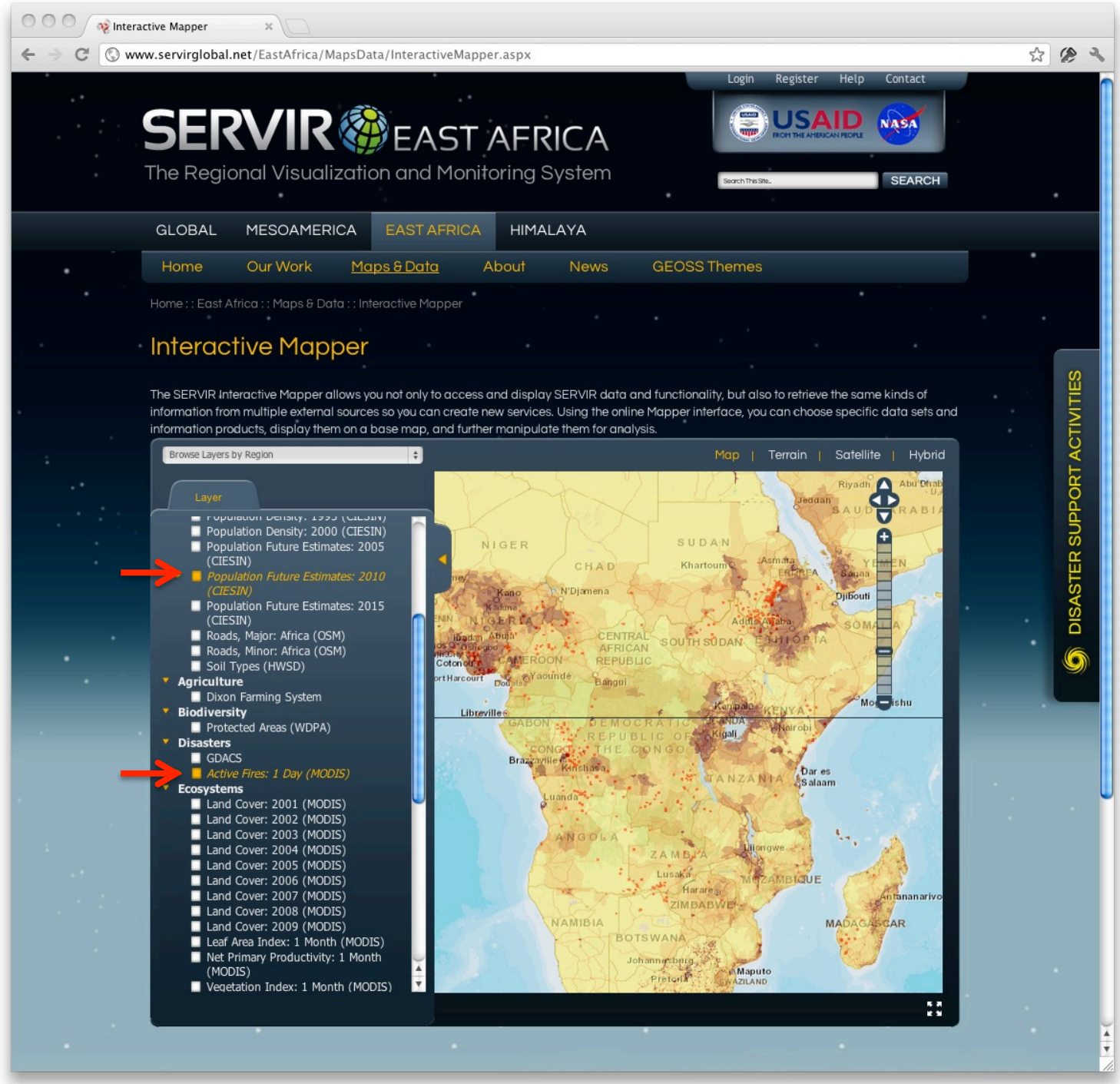
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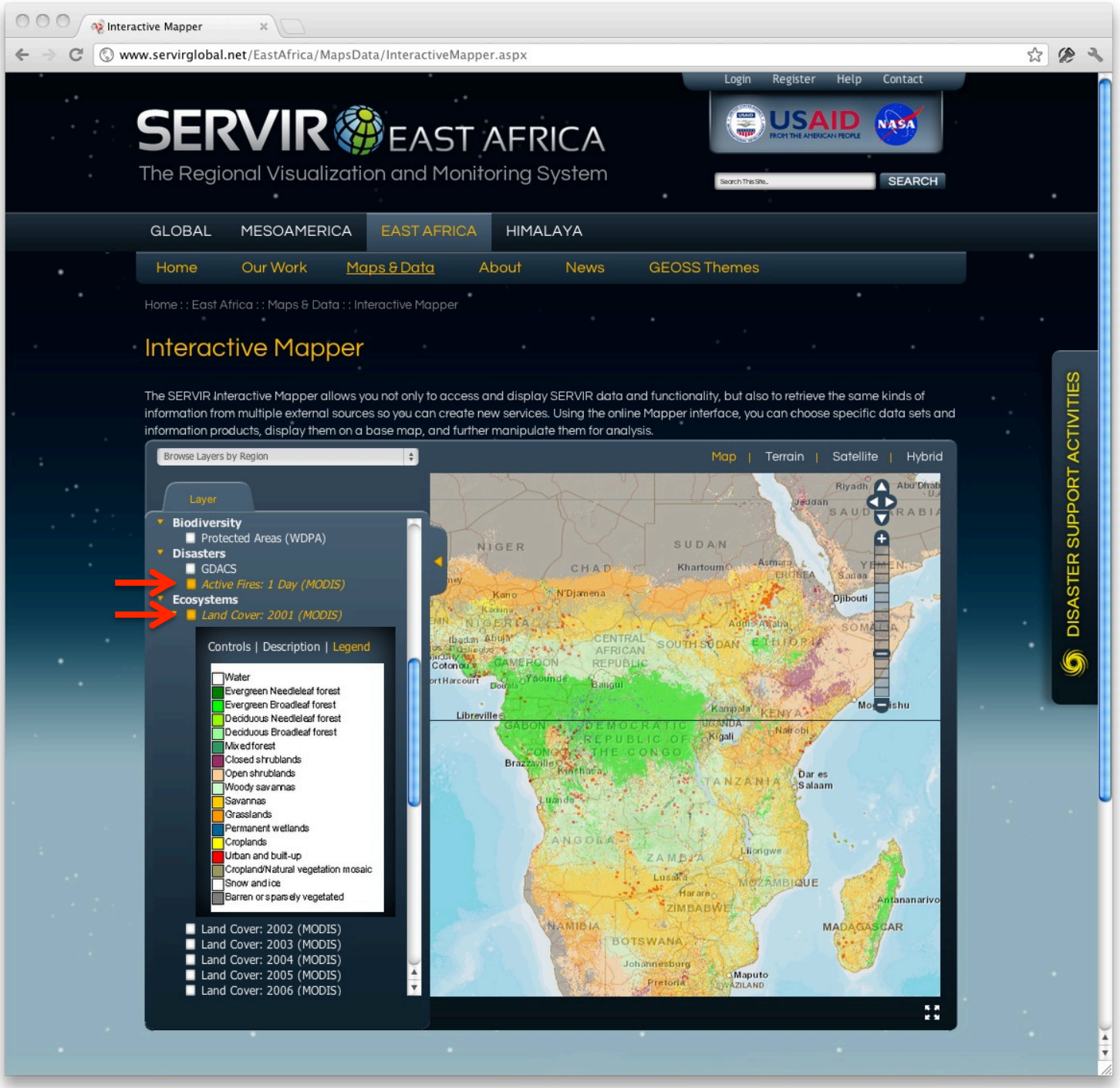
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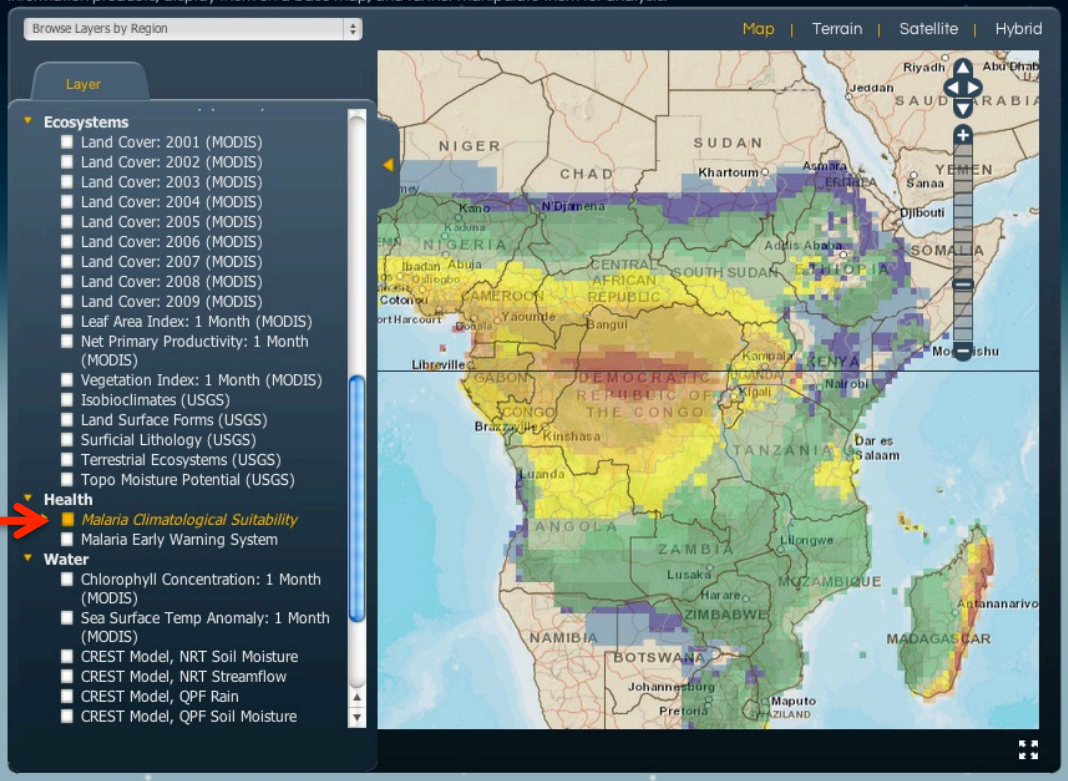

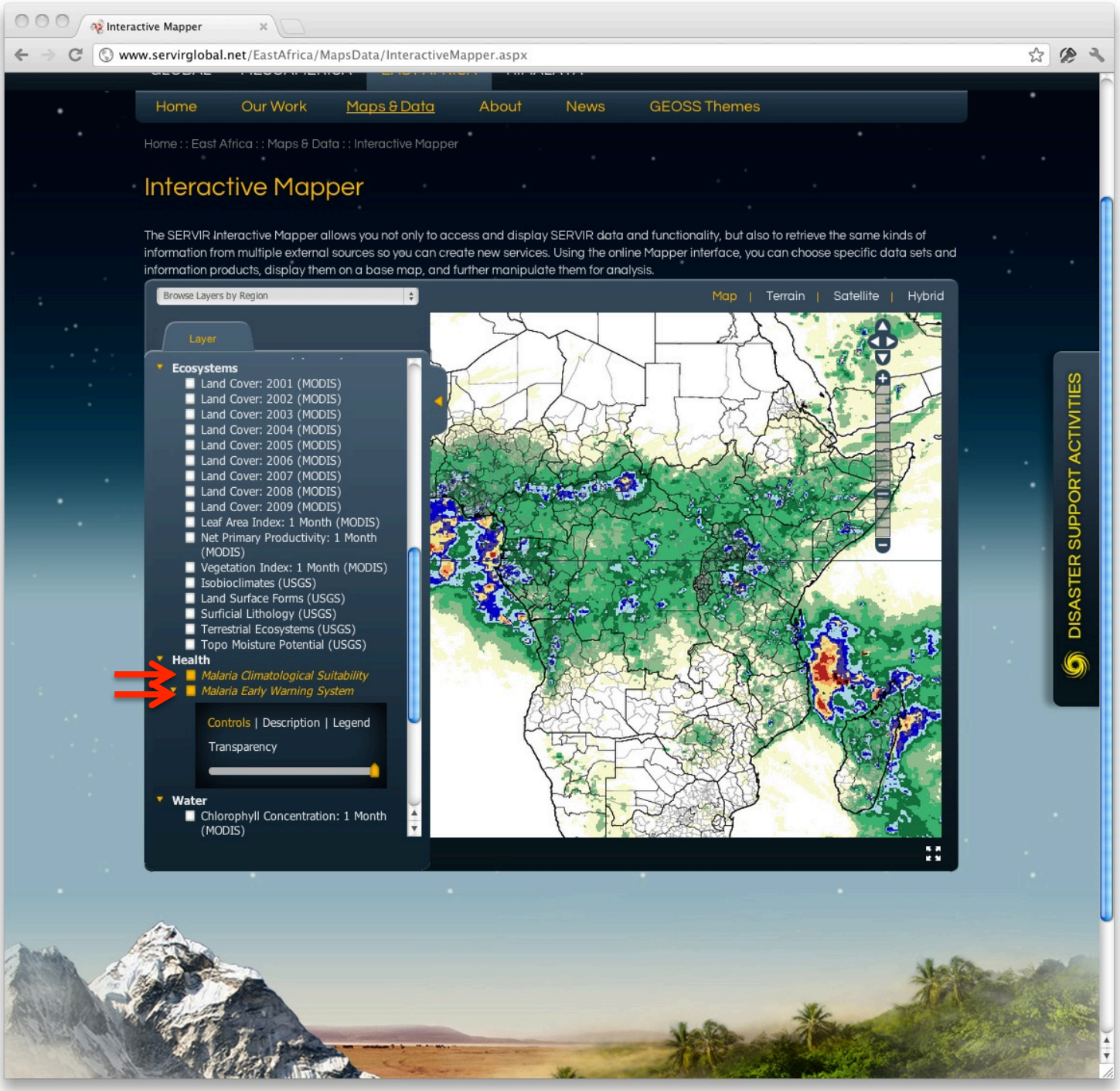
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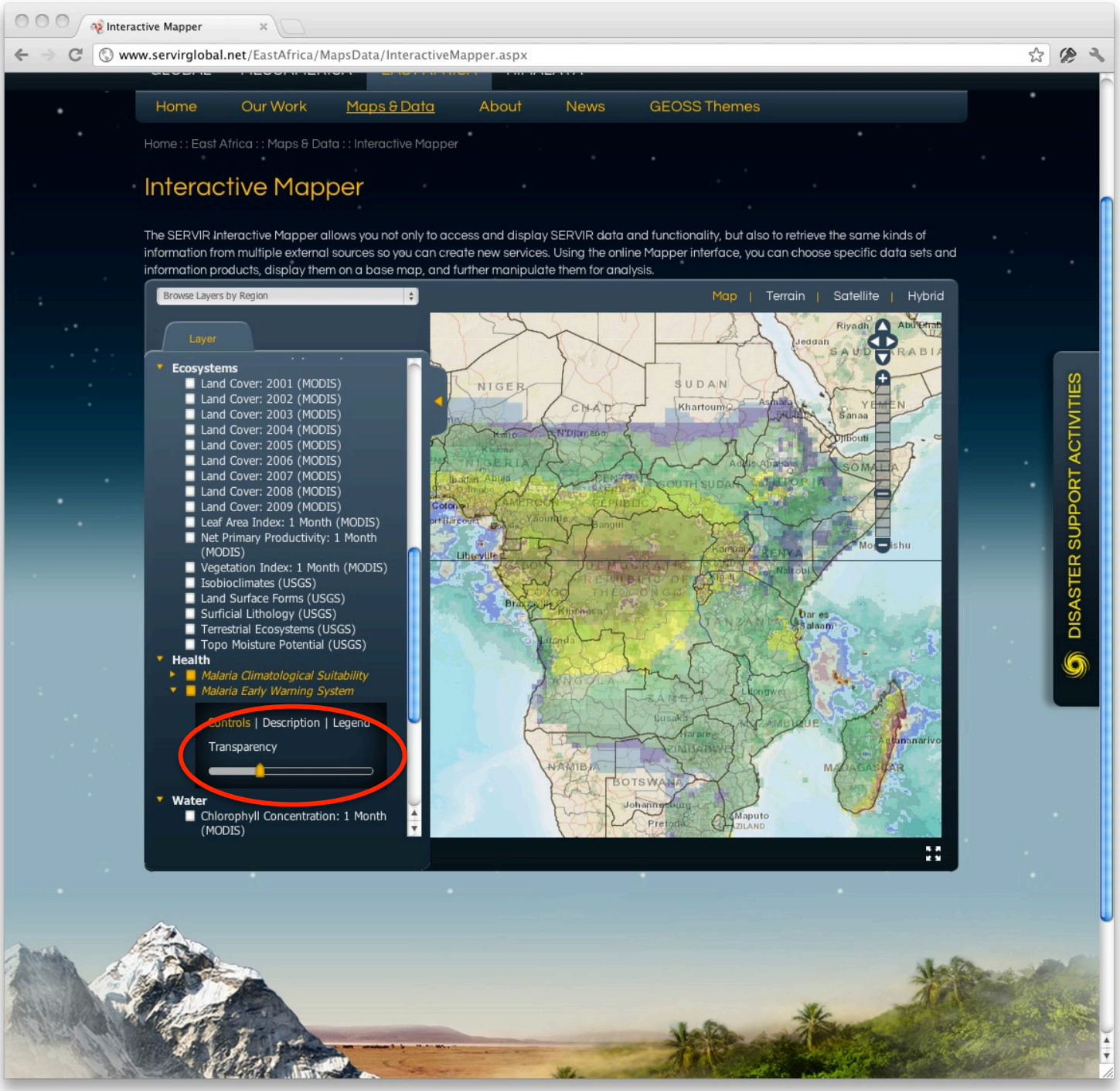
Browse Layers by Region
Map | Terrain | Satellite | Hybrid
Layer
Ecosystems
Land Cover: 2001 (MODIS)
Land Cover: 2002 (MODIS)
Land Cover: 2003 (MODIS)
Land Cover: 2004 (MODIS)
Land Cover: 2005 (MODIS)
Land Cover: 2006 (MODIS)
Land Cover: 2007 (MODIS)
Land Cover: 2008 (MODIS)
Land Cover: 2009 (MODIS)
Leaf Area Index: 1 Month (MODIS)
Net Primary Productivity: 1 Month (MODIS)
Vegetation Index: 1 Month (MODIS)
Isobioclimates (USGS)
Land Surface Forms (USGS)
Surficial Lithology (USGS)
Terrestrial Ecosystems (USGS)
Topo Moisture Potential (USGS)
Health
Malaria Climatological Suitability
Malaria Early Warning System
Controls | Description | Legend
Transparency
Water
Chlorophyll Concentration: 1 Month (MODIS)
DISASTER SUPPORT ACTIVITIES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Land Cover: 2001 (MODIS)
Land Cover: 2002 (MODIS)
Land Cover: 2003 (MODIS)
Land Cover: 2004 (MODIS)
Land Cover: 2005 (MODIS)
Land Cover: 2006 (MODIS)
Land Cover: 2007 (MODIS)
Land Cover: 2008 (MODIS)
Land Cover: 2009 (MODIS)
Leaf Area Index: 1 Month (MODIS)
Net Primary Productivity: 1 Month (MODIS)
Vegetation Index: 1 Month (MODIS)
Isobioclimates (USGS)
Land Surface Forms (USGS)
Surficial Lithology (USGS)
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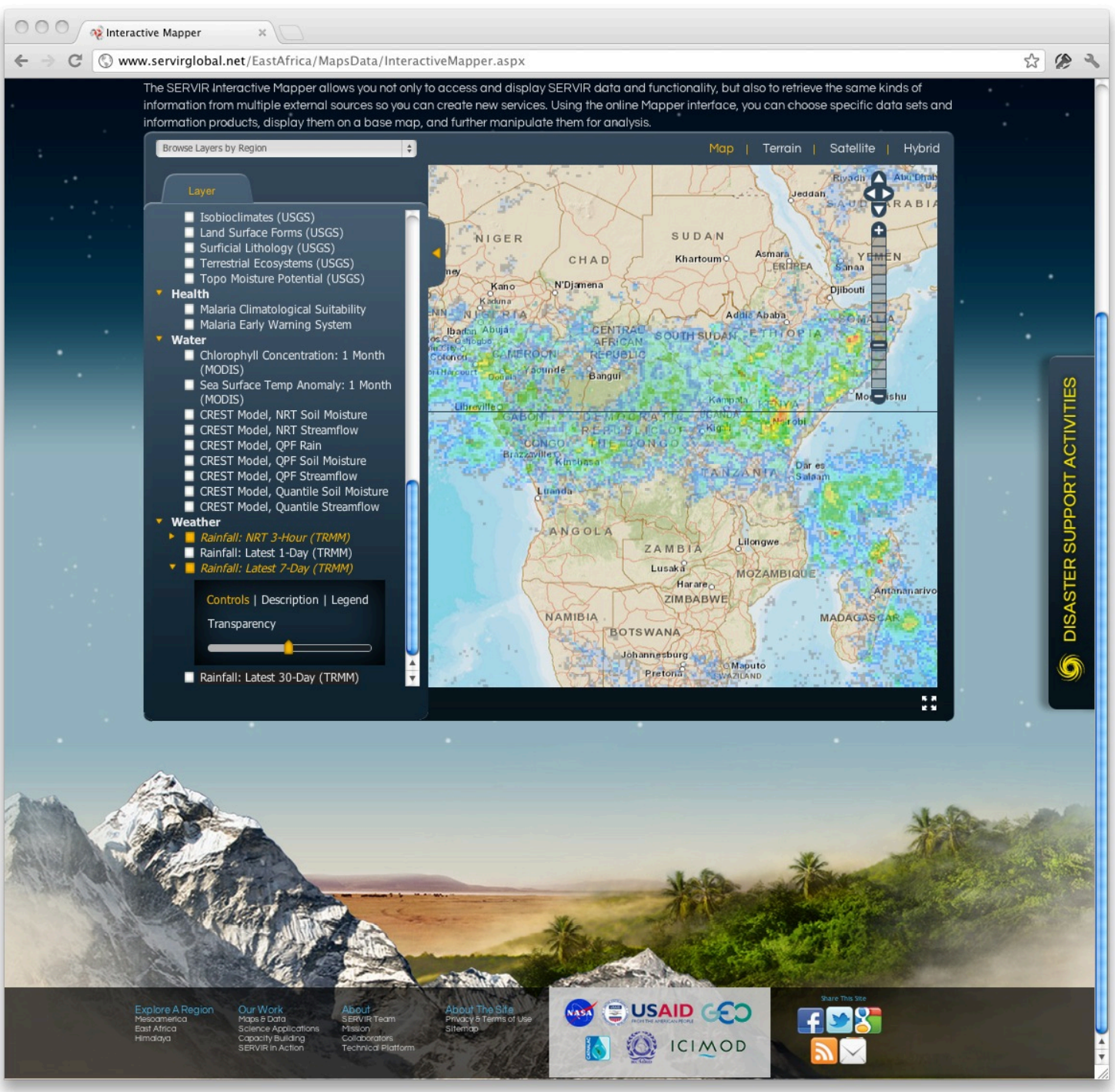
Controls | Description | Legend
Transparency
Water
Chlorophyll Concentration: 1 Month (MODIS)
Map | Terrain | Satellite | Hybrid
DISASTER SUPPORT ACTIVITIES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Map | Terrain | Satellite | Hybrid
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Isobioclimates (USGS)
Land Surface Forms (USGS)
Surficial Lithology (USGS)
Terrestrial Ecosystems (USGS)
Topo Moisture Potential (USGS)
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Malaria Climatological Suitability
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Chlorophyll Concentration: 1 Month (MODIS)
Sea Surface Temp Anomaly: 1 Month (MODIS)
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CREST Model, NRT Streamflow
CREST Model, QPF Rain
CREST Model, QPF Soil Moisture
CREST Model, QPF Streamflow
CREST Model, Quantile Soil Moisture
CREST Model, Quantile Streamflow
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Rainfall: NRT 3-Hour (TRMM)
Rainfall: Latest 1-Day (TRMM)
Rainfall: Latest 7-Day (TRMM)
Controls | Description | Legend
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Rainfall: Latest 30-Day (TRMM)
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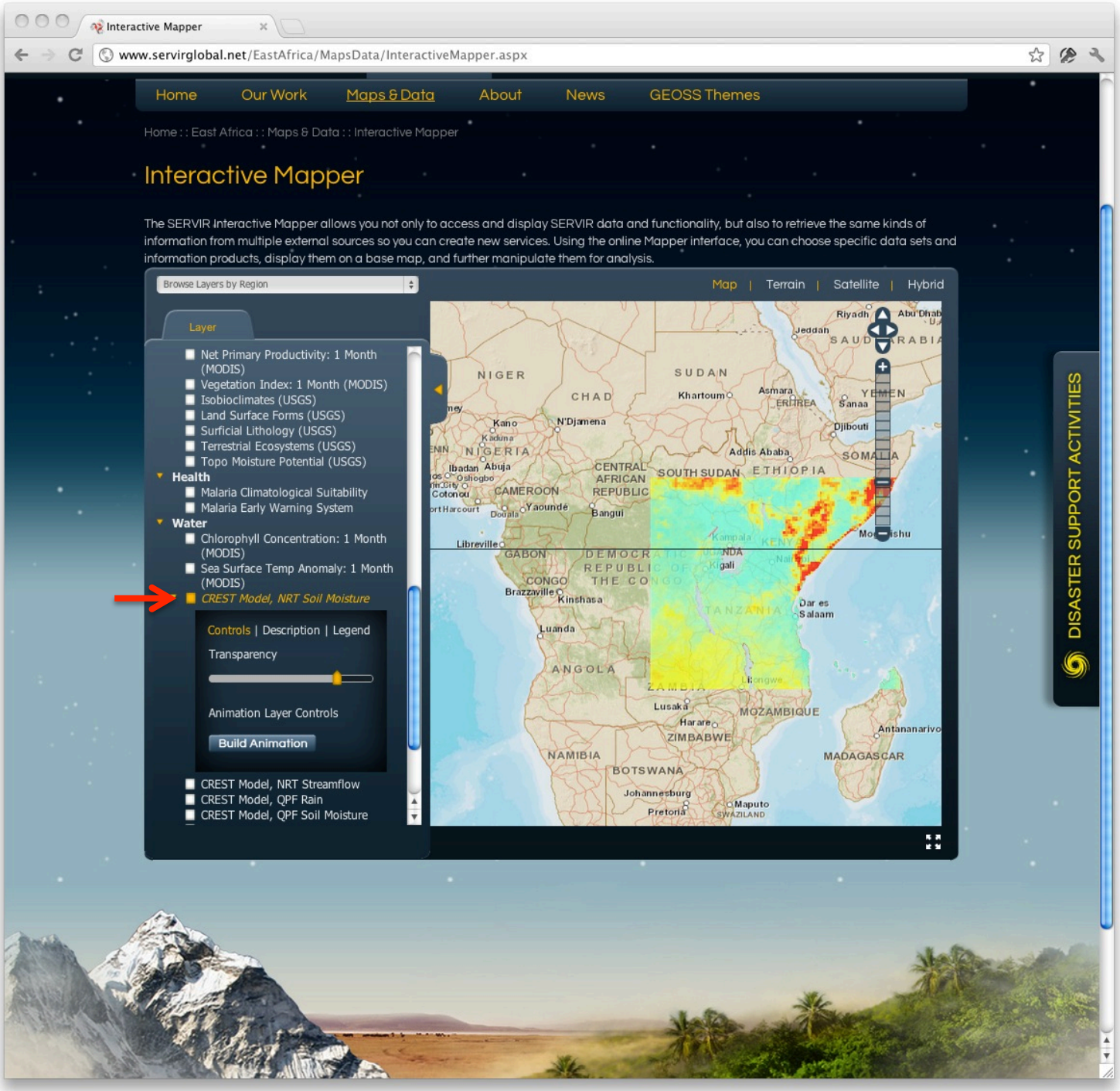
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Browse Layers by Region
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Layer
Net Primary Productivity: 1 Month (MODIS)
Vegetation Index: 1 Month (MODIS)
Isobioclimates (USGS)
Land Surface Forms (USGS)
Surficial Lithology (USGS)
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CREST Model, NRT Soil Moisture
Controls | Description | Legend
Transparency
Animation Layer Controls
Build Animation
CREST Model, NRT Streamflow
CREST Model, QPF Rain
CREST Model, QPF Soil Moisture
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Asmara
ERITREA
YEMEN
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Jeddah
Kano
N'Djamena
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BOTSWANA
MADAGASCAR
Johannesburg
Pretoria
Maputo
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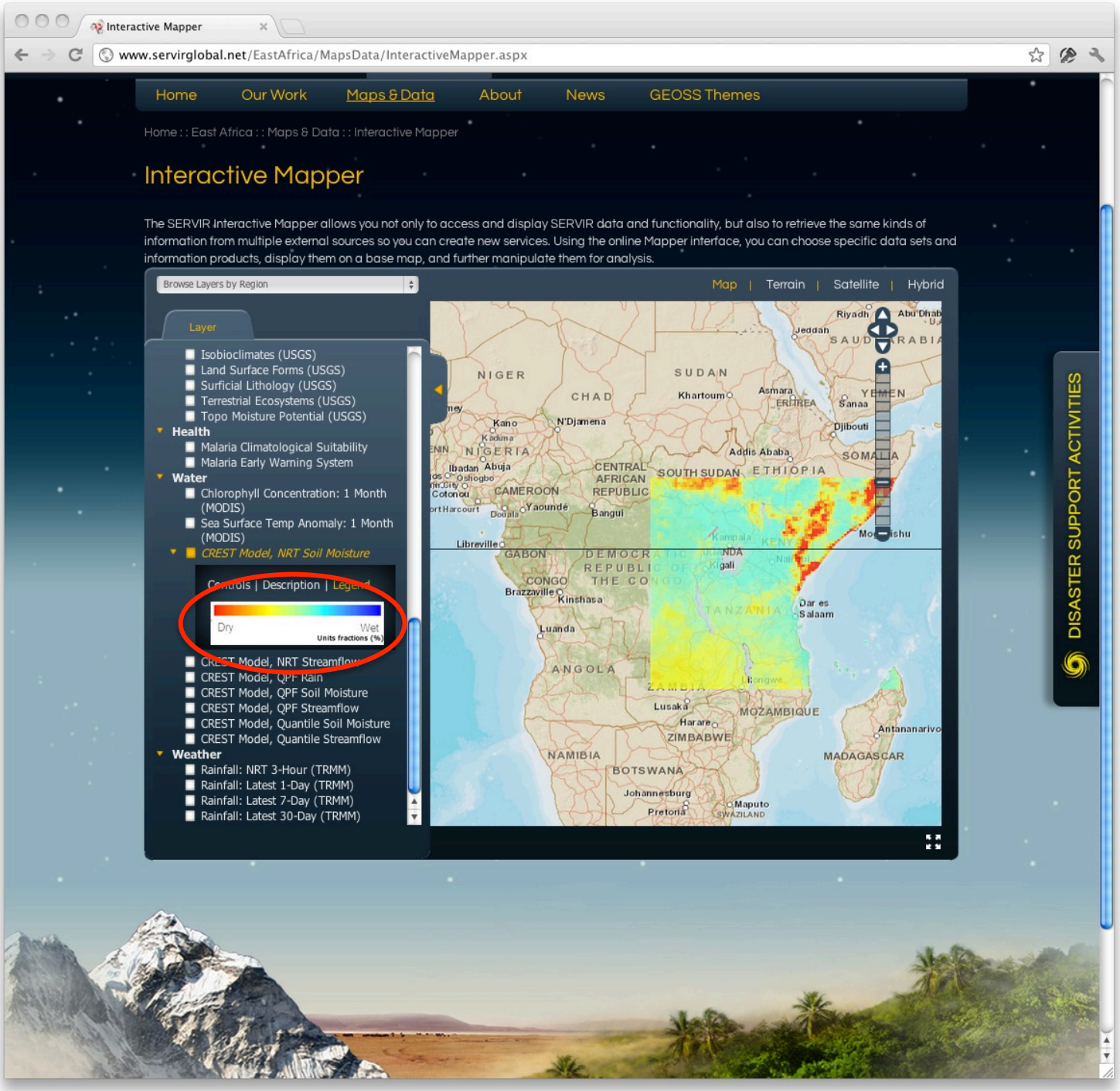
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Isobioclimates (USGS)
Land Surface Forms (USGS)
Surficial Lithology (USGS)
Terrestrial Ecosystems (USGS)
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Malaria Climatological Suitability
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Water
Chlorophyll Concentration: 1 Month (MODIS)
Sea Surface Temp Anomaly: 1 Month (MODIS)
CREST Model, NRT Soil Moisture
Controls | Description | Legend
Dry
Wet
Units fractions (%)
CREST Model, NRT Streamflow
CREST Model, QPF Rain
CREST Model, QPF Soil Moisture
CREST Model, QPF Streamflow
CREST Model, Quantile Soil Moisture
CREST Model, Quantile Streamflow
Weather
Rainfall: NRT 3-Hour (TRMM)
Rainfall: Latest 1-Day (TRMM)
Rainfall: Latest 7-Day (TRMM)
Rainfall: Latest 30-Day (TRMM)
Map | Terrain | Satellite | Hybrid
Riyadh
Jeddah
SAUDI ARABIA
NIGER
CHAD
SUDAN
Khartoum
Asmara
ERITREA
YEMEN
Sanaa
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Kano
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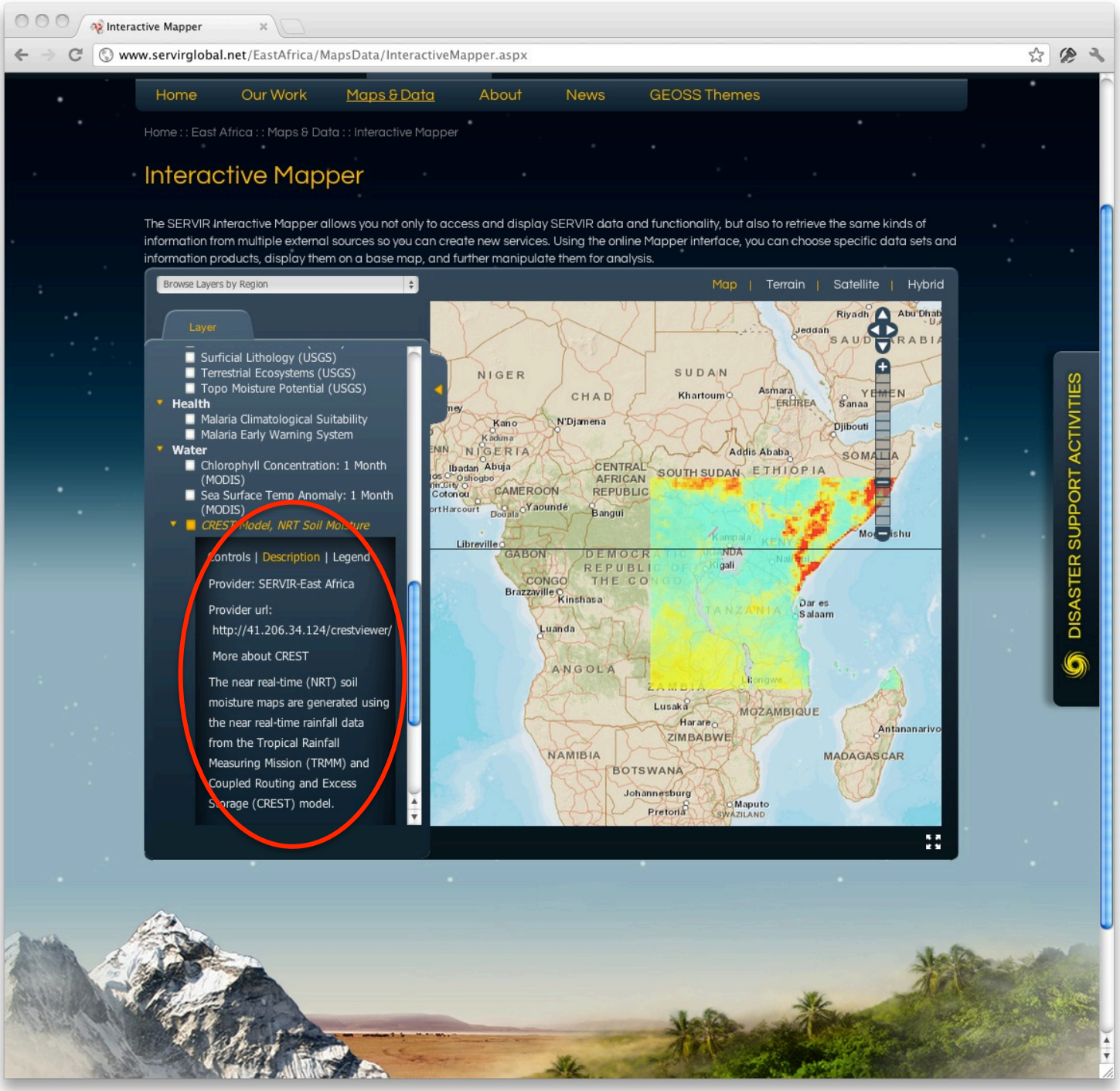
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Terrestrial Ecosystems (USGS)
Topo Moisture Potential (USGS)
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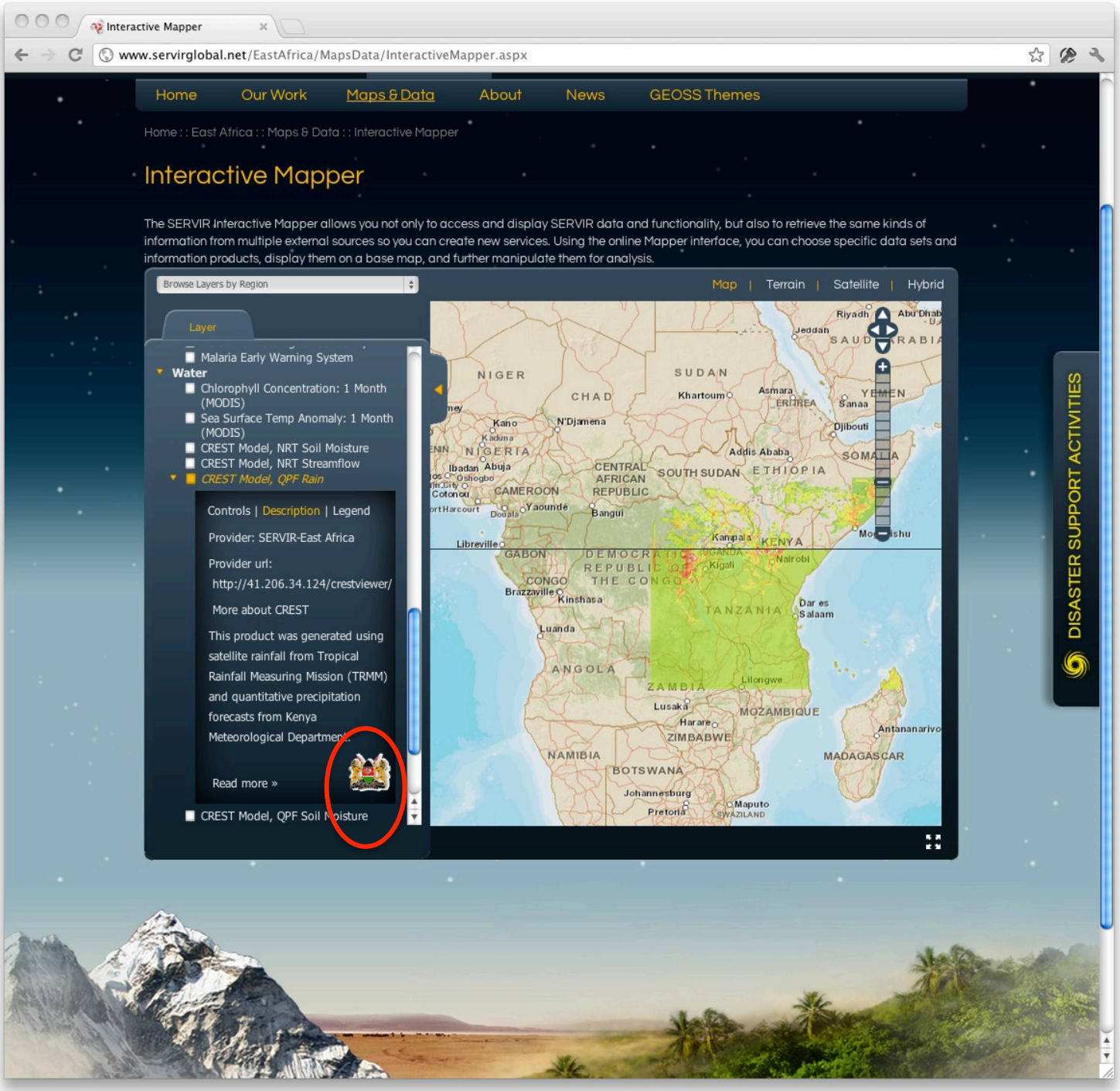
Malaria Early Warning System
Water
Chlorophyll Concentration: 1 Month (MODIS)
Sea Surface Temp Anomaly: 1 Month (MODIS)
CREST Model, NRT Soil Moisture
Controls | Description | Legend
Provider: SERVIR-East Africa
Provider url:
http://41.206.34.124/crestviewer/
More about CREST
The near real-time (NRT) soil moisture maps are generated using the near real-time rainfall data from the Tropical Rainfall Measuring Mission (TRMM) and Coupled Routing and Excess Storage (CREST) model.
Map | Terrain | Satellite | Hybrid
DISASTER SUPPORT ACTIVITIES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Browse Layers by Region
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Malaria Early Warning System
Water
Chlorophyll Concentration: 1 Month (MODIS)
Sea Surface Temp Anomaly: 1 Month (MODIS)
CREST Model, NRT Soil Moisture
CREST Model, NRT Streamflow
CREST Model, QPF Rain
Controls | Description | Legend
Provider: SERVIR-East Africa
Provider url:
http://41.206.34.124/crestviewer/
More about CREST
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SUDAN
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Asmara
ERITREA
YEMEN
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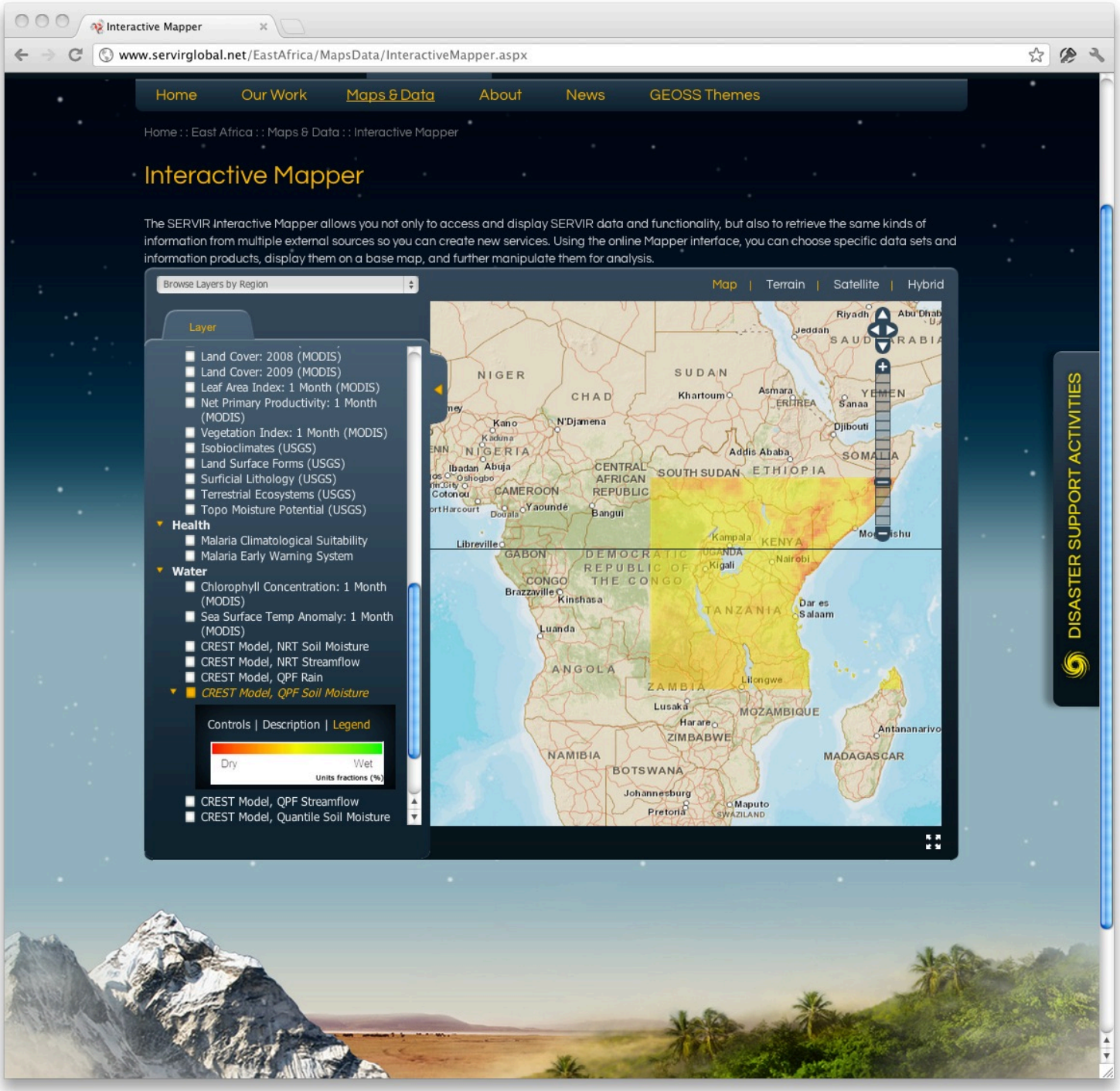
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Browse Layers by Region
Layer
Land Cover: 2008 (MODIS)
Land Cover: 2009 (MODIS)
Leaf Area Index: 1 Month (MODIS)
Net Primary Productivity: 1 Month (MODIS)
Vegetation Index: 1 Month (MODIS)
Isobioclimates (USGS)
Land Surface Forms (USGS)
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Water
Chlorophyll Concentration: 1 Month (MODIS)
Sea Surface Temp Anomaly: 1 Month (MODIS)
CREST Model, NRT Soil Moisture
CREST Model, NRT Streamflow
CREST Model, QPF Rain
CREST Model, QPF Soil Moisture
Controls | Description | Legend
Dry
Wet
Units fractions (%)
CREST Model, QPF Streamflow
CREST Model, Quantile Soil Moisture
Map | Terrain | Satellite | Hybrid
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Khartoum
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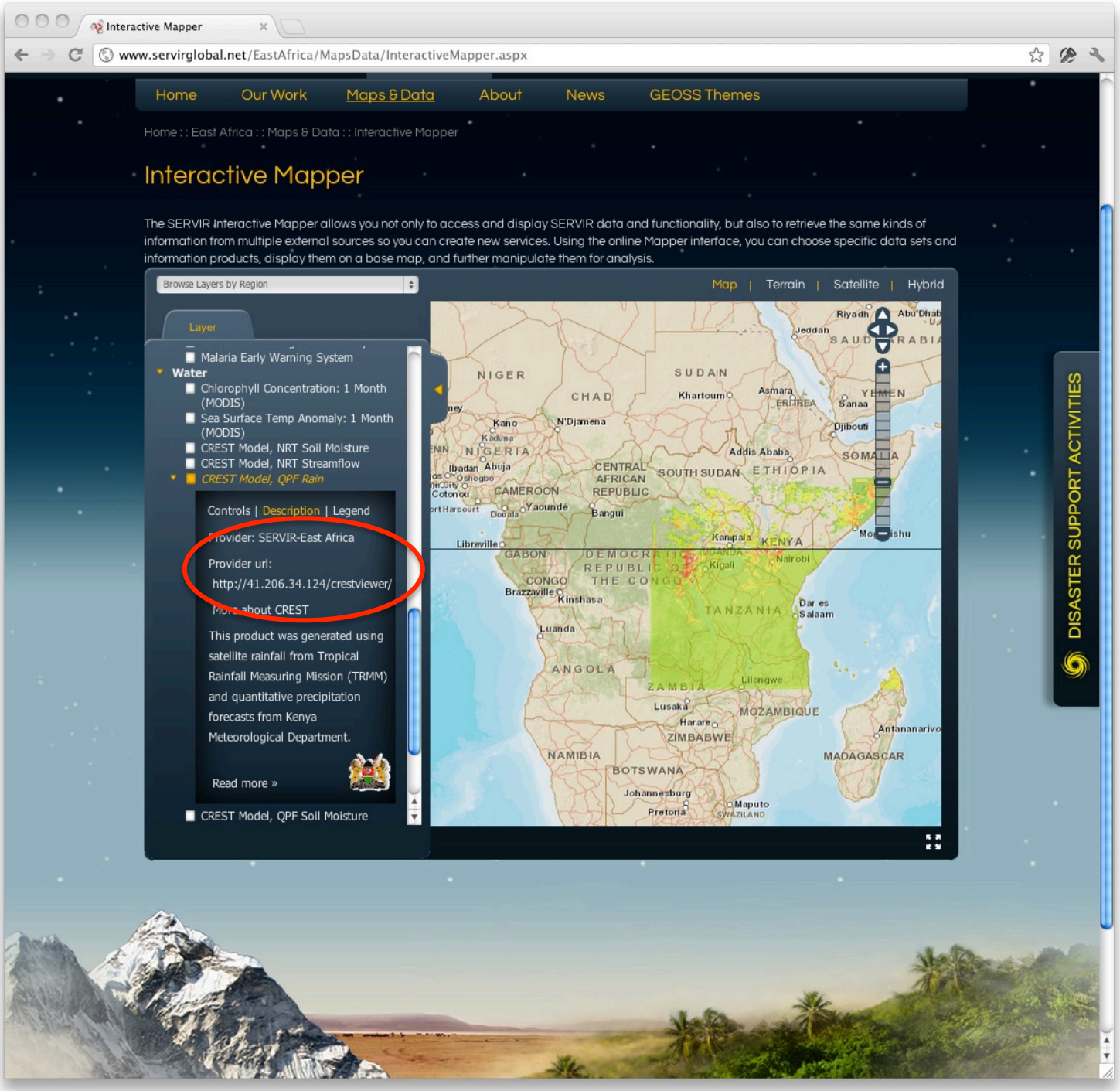
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Layer
Malaria Early Warning System
Water
Chlorophyll Concentration: 1 Month (MODIS)
Sea Surface Temp Anomaly: 1 Month (MODIS)
CREST Model, NRT Soil Moisture
CREST Model, NRT Streamflow
CREST Model, QPF Rain
Controls | Description | Legend
Provider: SERVIR-East Africa
Provider url:
http://41.206.34.124/crestviewer/
More about CREST
This product was generated using satellite rainfall from Tropical Rainfall Measuring Mission (TRMM) and quantitative precipitation forecasts from Kenya Meteorological Department.
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CREST Model, QPF Soil Moisture
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Johannesburg
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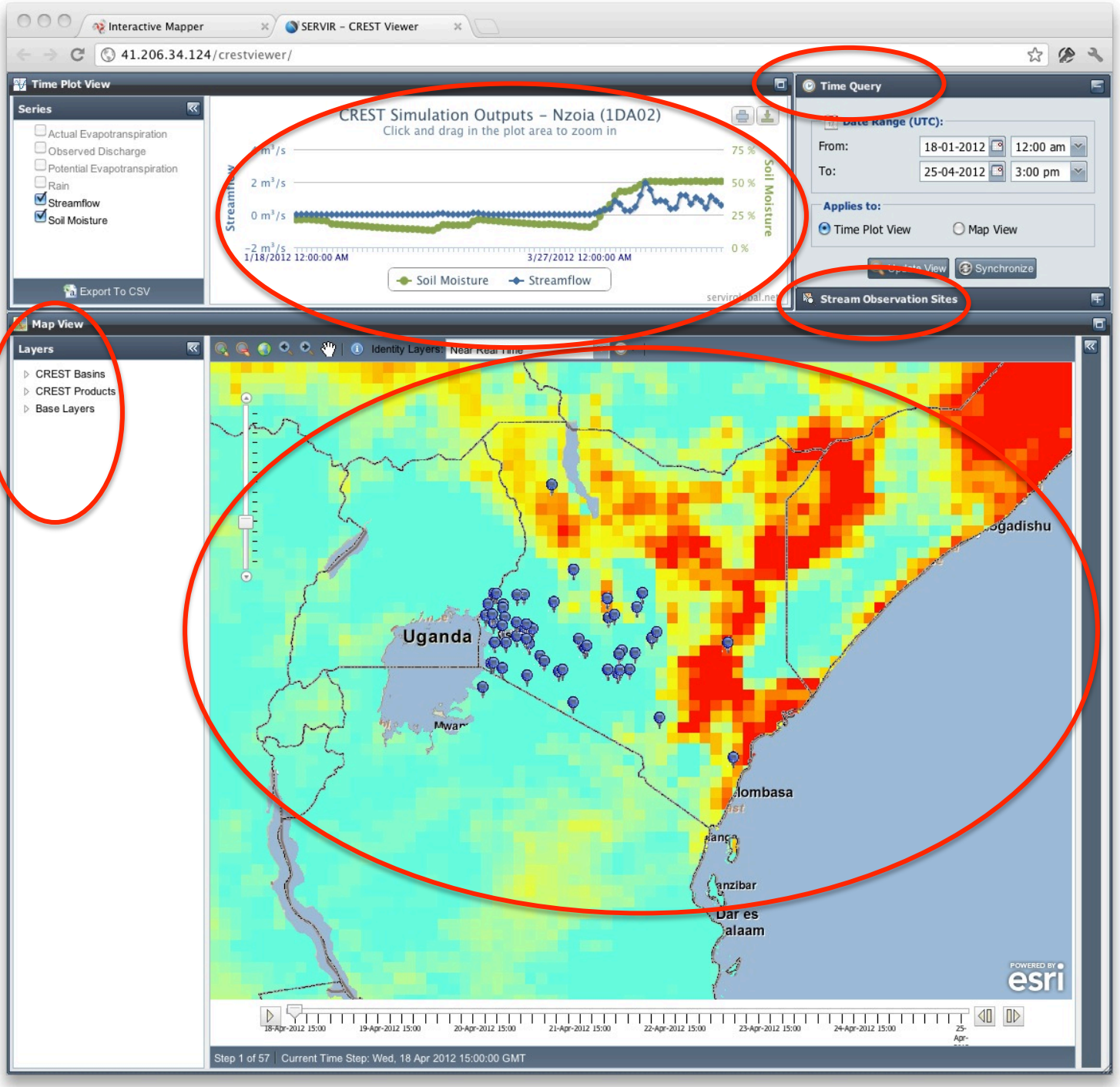
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Time Plot View
Series
Actual Evapotranspiration
Observed Discharge
Potential Evapotranspiration
Rain
Streamflow
Soil Moisture
Export To CSV
CREST Simulation Outputs - Nzoia (1DA02)
Click and drag in the plot area to zoom in
Streamflow
Soil Moisture
1/18/2012 12:00:00 AM
3/27/2012 12:00:00 AM
Soil Moisture
Streamflow
Time Query
Date Range (UTC):
From:
18-01-2012
12:00 am
To:
25-04-2012
3:00 pm
Applies to:
Time Plot View
Map View
Synchronize
Stream Observation Sites
Map View
Layers
CREST Basins
CREST Products
Base Layers
Identity Layers:
Near Real Time
Uganda
Mwanza
Mombasa
Zanzibar
Dar es Salaam
Mogadishu
POWERED BY esri
18-Apr-2012 15:00
19-Apr-2012 15:00
20-Apr-2012 15:00
21-Apr-2012 15:00
22-Apr-2012 15:00
23-Apr-2012 15:00
24-Apr-2012 15:00
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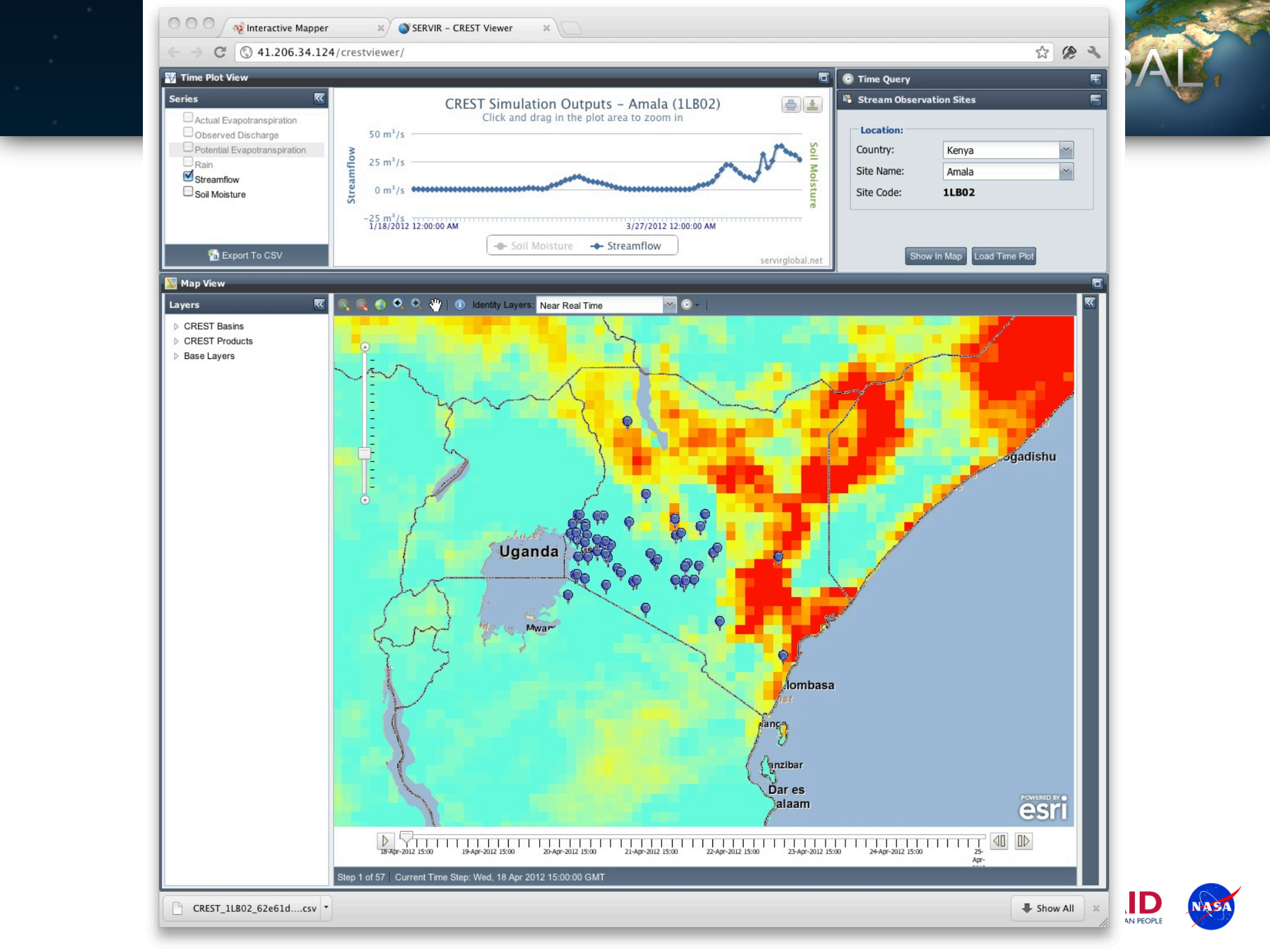
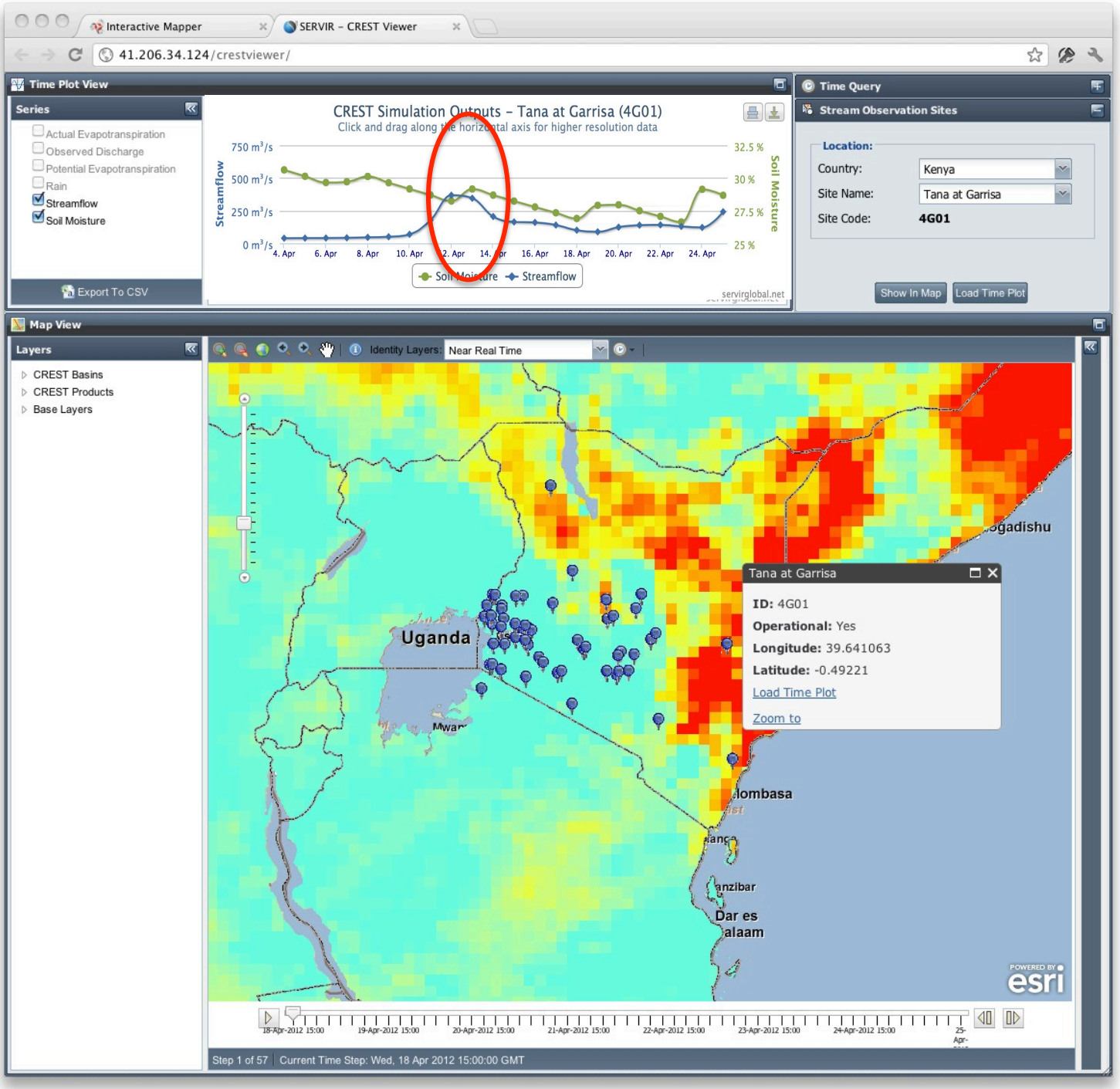
Current Time Step: Wed, 18 Apr 2012 15:00:00 GMT


Interactive Mapper
SERVIR - CREST Viewer
41.206.34.124/crestviewer/
Time Plot View
Series
Actual Evapotranspiration
Observed Discharge
Potential Evapotranspiration
Rain
Streamflow
Soil Moisture
Export To CSV
CREST Simulation Outputs - Amala (1LB02)
Click and drag in the plot area to zoom in
50 m³/s
25 m³/s
0 m³/s
-25 m³/s
Streamflow
Soil Moisture
1/18/2012 12:00:00 AM
3/27/2012 12:00:00 AM
Soil Moisture
Streamflow
servirglobal.net
Time Query
Stream Observation Sites
Location:
Country: Kenya
Site Name: Amala
Site Code: 1LB02
Show In Map
Load Time Plot
Map View
Layers
CREST Basins
CREST Products
Base Layers
Identity Layers: Near Real Time
Uganda
Mwanza
Mombasa
Zanzibar
Dar es Salaam
Mogadishu
POWERED BY esri
18-Apr-2012 15:00
19-Apr-2012 15:00
20-Apr-2012 15:00
21-Apr-2012 15:00
22-Apr-2012 15:00
23-Apr-2012 15:00
24-Apr-2012 15:00
Step 1 of 57
Current Time Step: Wed, 18 Apr 2012 15:00:00 GMT
CREST_1LB02_62e61d....csv
Show All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41.206.34.124/crestviewer/
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Actual Evapotranspiration
Observed Discharge
Potential Evapotranspiration
Rain
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Soil Moisture
Export To CSV
CREST Simulation Outputs - Tana at Garrisa (4G01)
Click and drag along the horizontal axis for higher resolution data
Streamflow
Soil Moisture
750 m³/s
500 m³/s
250 m³/s
0 m³/s
32.5 %
30 %
27.5 %
25 %
4. Apr
6. Apr
8. Apr
10. Apr
12. Apr
14. Apr
16. Apr
18. Apr
20. Apr
22. Apr
24. Apr
Soil Moisture
Streamflow
servirglobal.net
Time Query
Stream Observation Sites
Location:
Country:
Kenya
Site Name:
Tana at Garrisa
Site Code:
4G01
Show In Map
Load Time Plot
Map View
Layers
CREST Basins
CREST Products
Base Layers
Identity Layers:
Near Real Time
Tana at Garrisa
ID: 4G01
Operational: Yes
Longitude: 39.641063
Latitude: -0.49221
Load Time Plot
Zoom to
Uganda
Mwan
ogadishu
lombasa
anzibar
Dar es
alaam
POWERED BY
esri
18-Apr-2012 15:00
19-Apr-2012 15:00
20-Apr-2012 15:00
21-Apr-2012 15:00
22-Apr-2012 15:00
23-Apr-2012 15:00
24-Apr-2012 15:00
Step 1 of 57
Current Time Step: Wed, 18 Apr 2012 15:00:00 GMT

Summary

- SERVIR is committed to making the products useful to governmental and non-governmental agencies for their decision making.
- Collaborations to bring additional satellite observations, modeled products and in-situ data will strengthen those decision making capabilities.
- We will be excited to see how our datasets and applications can help the decision makers. Please contact me if you would like access to any of the datasets I presented today.

More information:
SERVIR Global: http://www.servirglobal.net

SERVIR Contacts:
Daniel Irwin – Project Director
Nancy Searby – NASA HQ Program Manager
Ashutosh Limaye – Project Scientist
(Ashutosh.Limaye@nasa.gov)

SERVIR GLOBAL
Aquarius
OSTM/Jason 2 (NOAA)
Jason
QuikSCAT*
TRMM
EO-1
Landsat-7 (USGS)
Aqua
ACRIMSAT
Terra
SORCE
GRACE (2)
Aura
CALIPSO
CloudSat
Connecting Space

To Village