ARSET Advanced Webinar on Using NASA Remote Sensing for Flood Monitoring and Management: Week 1

Exercise: Malawi Flood, 10-12 January 2015
Global Flood Monitoring System (GFMS)
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Objective: Use GFMS rainfall and streamflow data for regional flood monitoring.
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There are three parts to this exercise:
1) Learn GFMS features: navigation, zoom, selecting parameters
2) Analyze streamflow over Malawi
3) Analyze flood detection/intensity at a given location

Part 1: Learn GFMS features: navigation, zoom, selecting parameters
- Go to http://flood.umd.edu/
- Scroll down and note three maps:
  i) Flood Detection/Intensity (depth above threshold [mm])
  ii) Streamflow 12 Km resolution [m3/s]
  iii) Rainfall (7 – day accum) [mm]

Navigate the Map Using the Arrows

Zoom in and out on the map

Options for time series: click on the map for the location and enter T1 and T2 for desired time length

Start and End Times for Animation and 3-hour maps

Select variable to plot

- Click on the drop down options in **'Plot different variables'** and note the variables available:
    - o Flood Detection (Depth)
    - o Streamflow 12km res.
    - o Streamflow above Threshold
    - o Streamflow 1km res.
    - o Surface storage 1km res.
    - o Inundation map 1km res.
    - o Routed runoff 12km res.
    - o Rainfall (inst.)
    - o Rainfall (1-day)
    - o Rainfall (3-day)
    - o Rainfall (7-day)
- Select each variable and click on **'Plot'** and note the units of each variable
- Go to the middle map or select **'Streamflow 12 km res. [m3/s]'** from **'Plot different variables'**
- Using **'Zoom In / Zoom out'** and '**Pan the Map'** panel, zoom in over East Africa (see the map below).

Part 2: Analyze streamflow over Malawi

- Enter **Start Time:** 00Z10Jan2015 **and End Time:** 21Z15Jan2015

- Click on '**Animate'**
- Observe the shaded river channels and the shaded areas outside the river channels that show on-surface runoff.
- Observe how the streamflow changes in the major rivers
- Note down the range of the streamflow amount (include units)
- Select '**Rainfall (3-day)'** from the drop-down options in **'Plot different variables'** and click on **'Plot.'** Repeat the animation for the same times as above.
- Note how the rainfall changes over Malawi and how the streamflow animation relates to the rainfall change.
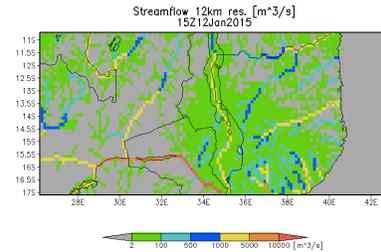
Part 3: Analyze flood detection/intensity at a given location

- Select '**Flood Detection (Depth)'** from the drop-down options in **'Plot different variables'** and click on **'Plot.'**
- Enter **Start Time:** 00Z10Jan2015 **and End Time:** 21Z15Jan2015
- Click on '**Animate.'**
- The shaded areas show where the streamflow is above flood threshold. Note how the flood depth changes in different rivers.
- Note the highest flood depth observed in the Malawi rivers during this time period.
- To the right of the map, go to '**Plot time series for an individual point (lat,lon)**:'

- Enter the following lat-lon in the boxes: -15.43 and 35.69
    - o T1: 00Z01Jan 2015
    - o T2: 21Z31Jan2015
- Click on '**See time series.'**

- You will get a time series of flood intensity. Note how many flooding episodes occurred at this location during the selected period.
- Click on the map to select another lat-lon location over Malawi or Mozambique, or enter another pair of lat-lon in the boxes and plot the **Flood Detection (Depth)** time series