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

Exercise: Texas Flood, 12-15 May 2015
Global Flood Monitoring System (GFMS)
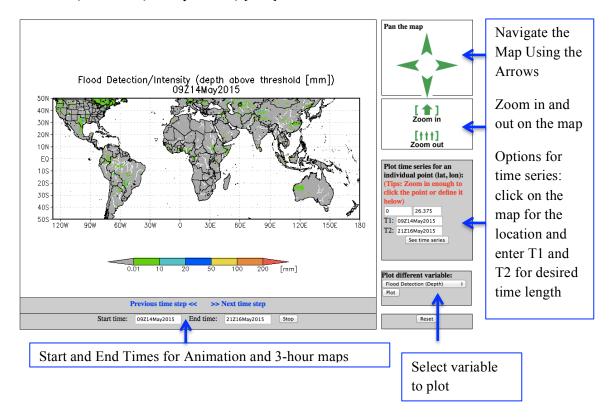==

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 Texas
3) Analyze flood detection/intensity at a given location

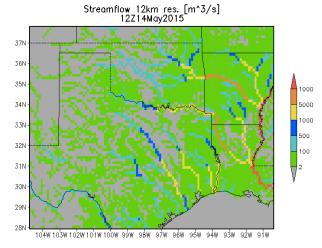**Part 1: Learn GFMS features: navigation, zoom, selecting parameters**
- Go to http://flood.umd.edu/
- Scroll down and note three maps:
  i) Flood Detection/Intensity (depth above threshold [mm])
  ii) Streamflow 12 Km resolution [m3/s]
  iii) Rainfall (7 – day accum) [mm]

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:
  - Flood Detection (Depth)
  - Streamflow 12km res.
  - Streamflow above Threshold
  - Streamflow 1km res.
  - Surface storage 1km res.
  - Inundation map 1km res.
  - Routed runoff 12km res.
  - Rainfall (inst.)
  - Rainfall (1-day)
  - Rainfall (3-day)
  - 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 Texas and Oklahoma.
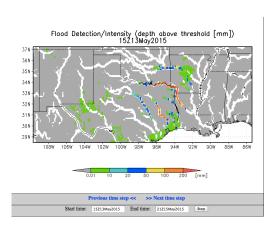

Part 2: Analyze streamflow over Texas and Oklahoma
- Enter **Start Time:** 00Z12May2015 **and End Time:** 21Z15May2015
- Click on '**Animate'**
- Observe the shaded river channels and the shaded areas outside the river channels that show on-surface runoff.
- Observe how the streamflow changes in the 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 Texas and how the streamflow animation relates to the rainfall change.
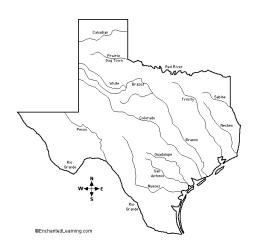

Streamflow 12km res. [m^3/s]
12Z14May2015

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:** 00Z12May2015 **and End Time:** 21Z15May2015
- 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 Texas rivers during this time period.
- To the right of the map, go to '**Plot time series for an individual point (lat,lon)**:'

2

- Enter the following lat-lon in the boxes: 35.56 and –94.52 (This location is on the Red River)
    - o T1: 00Z01May 2015
    - o T2: 21Z15Jun2015
- 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 Texas, or enter another pair of lat-lon in the boxes and plot the **Flood Detection (Depth)** time series.