

Welcome to

NASA Applied Remote Sensing Training Program (ARSET) Webinar Series

20 November 2012 : Week-3

Introduction to Remote Sensing Data for Flood and Drought Monitoring

Course Dates: Every Tuesday, November 6 - December 4, 2012

ARSET
Applied Remote SEnsing Training

A project of NASA Applied Sciences



Announcements

- **Fourth Week of course (November 27th)**
 - **There will be no 8 AM EST session**
 - You will be sent a link for a recorded version
 - A limited number of seats are available for the live session at 2 pm EST. If interested in joining that session, send email to:
marines.martins@ssaihq.com

Webinar Presentations can be found on:

<http://water.gsfc.nasa.gov/webinars/>

For Webinar Recording Link :

Contact : Marines Martins

Email: marines.martins@ssaihq.com

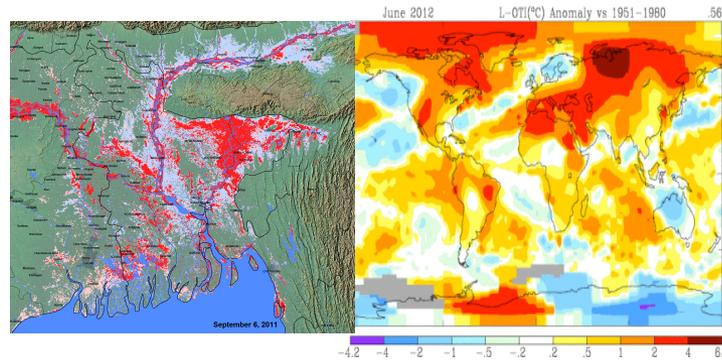
Course Outline

Week 1



**Intro. & Background:
Satellite Remote Sensing**

Week 2



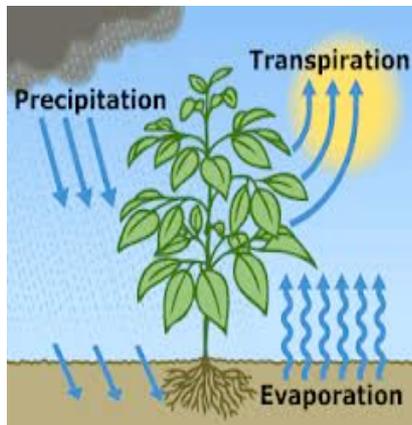
**Flood and Drought
[Rainfall, Weather
and Climate Data]**

Week 3



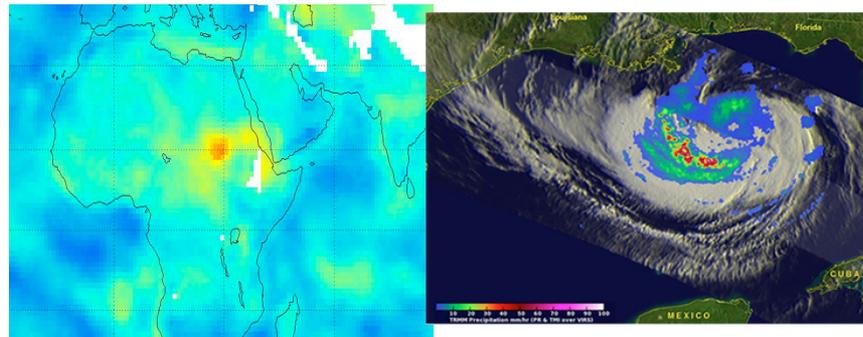
Web-tools

Week 4



Evapotranspiration

Week 5



Data Applications/ Case Studies

Week 3: Overview of Web-based Tools for Data Access and Imaging

- *Where and how to access Rain, Temperature, Humidity, Wind data*

NASA Rain Data Sources

- Global Precipitation Climatology Project (GPCP)
- Tropical Rainfall Measuring Mission (TRMM) satellite observations

*The TRMM Multi-satellite Precipitation Analysis (TMPA):
Quasi-Global, Multiyear, Combined-Sensor Precipitation
Estimates at Fine Scales*

AIRS Temperature and Humidity

AIRS/AMSU Standard Data products:

Surface skin and Air Temperature

Temperature Profile

Humidity (Water Vapor) Profile

Column-integrated Water Vapor (Precipitable Water)

Cloud Cover and Height

MERRA Temperature, Humidity, and Wind

Surface skin and Air Temperature

Temperature Profile

East-West and North-South wind
components

Humidity (Water Vapor) Profile

Column-integrated Water Vapor
(Precipitable Water)

Levels of Data Processing

Level 1 Products

Orbital data

Used to produce



Level 2 Products

Orbital data

Used to produce



Level 3 Products

composites
of level 2 products

Less Processing

- More user control
- Highest spatial/temporal resolution
- Harder to use

Advanced
Webinar/Hands-on
Training)

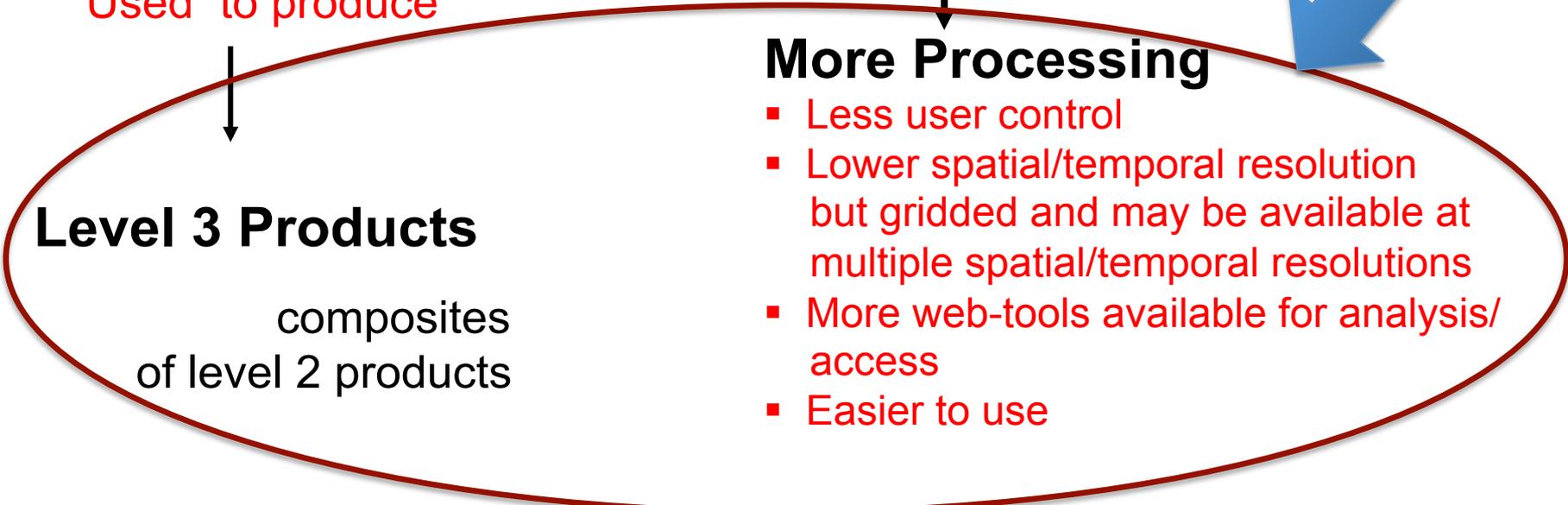


This Webinar



More Processing

- Less user control
- Lower spatial/temporal resolution but gridded and may be available at multiple spatial/temporal resolutions
- More web-tools available for analysis/access
- Easier to use



Week 3: Overview of Web-based Tools for Data Access and Imaging

- *NASA interactive web-tools for data access, analysis, visualization:*
Giovanni
MIRADOR
- *Flood Web-sites*
- *Drought Web-sites:*

What is Giovanni?

<http://giovanni.gsfc.nasa.gov/>

Giovanni: GES-DISC (Goddard Earth Sciences Data and Information Services Center) Interactive Online Visualization ANd aNalysis Infrastructure

Giovanni is a Web-based application to visualize, analyze, and access geophysical data without having to download the data.

Giovanni is comprised of a number **‘portals’**, each for gridded, Level-3 geophysical quantities from different satellite/sensors and models.

<http://giovanni.gsfc.nasa.gov/>

Temperature, Humidity from AIRS: Atmospheric Portal

The screenshot shows the Giovanni web application interface. The browser address bar displays `disc.sci.gsfc.nasa.gov/giovanni/overview/index.html`. The page header includes navigation links like "Analyze Data with Giovanni", "Search for Data with Mirador", and "Simple Subset Wizard". A banner image reads "Giovanni - The Bridge Between Data and Science".

The main content area is titled "Giovanni" and includes a breadcrumb trail: "You are here: GES DISC Home » Giovanni » Overview » Giovanni". Below this, there are two tabs: "Giovanni Portals" (selected) and "Giovanni Parameter List".

The "Giovanni Portals" section is expanded to show "Atmospheric Portals (scroll down to view complete list)". A list of data portals is displayed, with "Aqua/AIRS Global: Daily" and "Aqua/AIRS Global: Monthly" highlighted by a red box. The word "AIRS" is overlaid in large blue text on the right side of the list. Other portals include "A-Train along CloudSat Track", "Aerosol Optical Thickness Measurement and Model Comparison: Daily/Monthly", "MISR Daily/Monthly", "Terra and Aqua MODIS: Daily/Monthly", "Application and Education Portals", "Meteorological Portals", "Ocean Portals", and "Hydrology Portals".

On the left side, there is a sidebar with an "OVERVIEW" section containing links like "What is Giovanni?", "Who Uses Giovanni?", "Giovanni Parameters", "Giovanni Plot Types", "How to Use Giovanni", and "How to Acknowledge". Below this is an "Additional Features" section with links for "News", "Users Manual", "Publications", "Newsletters", "Feedback", and "FAQ".

At the bottom of the page, a descriptive paragraph states: "Giovanni is a Web-based application developed by the GES DISC that provides a simple and intuitive way to visualize, analyze, and access vast amounts of Earth science remote sensing data without having to download the data." The footer shows the URL `disc.sci.gsfc.nasa.gov/giovanni/overview/giovanni-parameters`.

Rain: Giovanni Hydrology Portal

TRMM Online Visualization and Analysis System (TOVAS)

NASA GES DISC Goddard Earth Sciences Data and Information Services Center Search GES DISC
Search

GES DISC Home **Data Services** **Science Portals** **Mission Portals**

Analyze Data with Giovanni Search for Data with Mirador Simple Subset Wizard More...

Giovanni - The Bridge Between Data and Science

» OVERVIEW

- + What is Giovanni?
- + Who Uses Giovanni?
- + Giovanni Parameters
- + Giovanni Plot Types
- + How to Use Giovanni
- + How to Acknowledge Giovanni
- + Acknowledgements

Additional Features

- + News
- + Users Manual
- + Publications
- + Newsletters
- + Feedback
- + FAQ

You are here: [GES DISC Home](#) » [Giovanni](#) » [Overview](#) » Giovanni

Giovanni

Giovanni Portals **Giovanni Parameter List**

- ▶ **Atmospheric Portals (scroll down to view complete list)**
- ▶ **Application and Education Portals**
- ▶ **Meteorological Portals**
- ▶ **Ocean Portals**
- ▼ **Hydrology Portals**
 - [Global Land Data Assimilation System Monthly Data](#)
 - [Global Land Data Assimilation System 3-Hourly Data](#)
 - [North American Land Data Assimilation System Hourly Data](#)
 - [TRMM Online Visualization and Analysis System \(TOVAS\)](#)

Hide News

Temperature Humidity, Winds from MERRA: Giovanni Meteorological Portal

 **GES DISC** Goddard Earth Sciences Data and Information Services Center

Search GES DISC
Search

GES DISC Home | **Data Services** | **Science Portals** | **Mission Portals**

Analyze Data with Giovanni | Search for Data with Mirador | Simple Subset Wizard | More...

Giovanni - The Bridge Between Data and Science

» **OVERVIEW**

- + What is Giovanni?
- + Who Uses Giovanni?
- + Giovanni Parameters
- + Giovanni Plot Types
- + How to Use Giovanni
- + How to Acknowledge Giovanni
- + Acknowledgements

Additional Features

- + News
- + Users Manual
- + Publications
- + Newsletters
- + Feedback
- + FAQ

You are here: [GES DISC Home](#) » [Giovanni](#) » [Overview](#) » Giovanni

Giovanni

Giovanni Portals | **Giovanni Parameter List**

- ▶ **Atmospheric Portals (scroll down to view complete list)**
- ▶ **Application and Education Portals**
- ▼ **Meteorological Portals**

- [Modern Era Retrospective-Analysis for Research and Applications \(MERRA\): 2D Monthly](#) 
- [Modern Era Retrospective-Analysis for Research and Applications \(MERRA\): 3D Monthly](#) 
- [MERRA Monthly Analysis](#) 
- [MERRA Monthly Chemistry Forcing](#) 
- [MERRA Hourly 2D](#)
- [MERRA Hourly 3D](#)
- [TRMM Online Visualization and Analysis System \(TOVAS\)](#)
- [Clouds and the Earth's Radiant Energy System \(CERES\)](#) 



HIDE NEWS

Giovanni – Select Data

You are here: [GES DISC Home](#) » [Precipitation](#) » TRMM Online Visualization and Analysis System (TOVAS)

TRMM Online Visualization and Analysis System (TOVAS)

Welcome to TOVAS, a member of the Giovanni (GES-DISC Interactive Online Visualization AND aNalysis Infrastructure) family, which provides users with an easy-to-use, Web-based interface for the visualization and analysis of global precipitation data.

Welcome to TOVAS, a member of the [Giovanni](#) (GES-DISC (Goddard Earth Sciences Data and Information Services Center) Interactive Online Visualization AND aNalysis Infrastructure) family, which provides users with an easy-to-use, Web-based interface for the visualization and analysis of global precipitation data. See the [FAQ](#) for further usage on this tool.

Instances

Near-Real-Time Monitoring Product (For research, use Archive Data)

[Experimental Real-Time TRMM Multi-Satellite Precipitation Analysis \(TMPA-RT\): 3B42RT](#)
[Daily Global and Regional Rainfall \(3B42RT derived\)](#)
[TMPA-RT Intermediate IR Product: 3B41RT \(VAR\)](#)
[TMPA-RT Intermediate Microwave Product: 3B40RT \(HQ\)](#)

Satellite Rainfall Archives

[Monthly Global Precipitation \(GPCP\)](#)
[3-hourly TRMM and Other Rainfall Estimate \(3B42 V7\)](#)
[Daily TRMM and Other Rainfall Estimate \(3B42 V7 derived\)](#)
[Monthly TRMM and Other Data Sources Rainfall Estimate \(3B43, 3A12, 3A25 V7\)](#)

Ground Observation Archives

[Monthly Willmott and Matsuura Global Precipitation \(1950 - 1999\)](#)
[Monthly GPCC Rainfall \(1986 - Present, Monitoring Product\)](#)

Rainfall Product Intercomparison

[Inter-Comparison of Rainfall Climatology \(non-java version\)](#)
[Beta Prototype: Inter-Comparison of TRMM L-3 V6 and V7 Monthly Products](#)
[Beta Prototype: Inter-Comparison of 3-hourly Precipitation Products](#)
[Beta Prototype: Inter-comparison of Daily Precipitation Products](#)

Climatology

[TRMM Composite Climatology](#)

TRMM
Rainfall Data
Products

```
graph LR; A[TRMM Rainfall Data Products] --> B[Experimental Real-Time TRMM Multi-Satellite Precipitation Analysis (TMPA-RT): 3B42RT]; A --> C[Daily Global and Regional Rainfall (3B42RT derived)]; A --> D[3-hourly TRMM and Other Rainfall Estimate (3B42 V7)]; A --> E[Daily TRMM and Other Rainfall Estimate (3B42 V7 derived)]; A --> F[Monthly TRMM and Other Data Sources Rainfall Estimate (3B43, 3A12, 3A25 V7)]; A --> G[TRMM Composite Climatology];
```

Giovanni: Select Spatial-Temporal-Visualization Options

The screenshot displays the Giovanni web interface with several key sections highlighted by red boxes and arrows:

- Spatial Selection:** A map showing a selected area of interest over the Americas. The "Area of Interest" fields are: West: -131.814, North: 55.348, South: -8.285, East: -35.838. A red arrow points from the "Spatial Selection" label to the map.
- Parameter Selection:** The "Parameters" section shows "precipitation" selected under "Data Product Info". A red arrow points from the "Parameter Selection" label to this section.
- Temporal Selection:** The "Temporal" section shows "Begin Date" and "End Date" both set to August 31, 2012. A red arrow points from the "Temporal Selection" label to this section.
- Visualization Selection:** The "Select Visualization" dropdown menu is open, showing options like "Lat-Lon map, Time-averaged", "Time series", "Latitude-Time Hovmoller Diagram", etc. A red arrow points from the "Visualization Selection" label to this menu.
- Generate Visualization:** The "Generate Visualization" button is highlighted with a red box. A red arrow points from the "Generate Visualization" label to this button.

Additional interface elements include "Cursor Coordinates: -35.83789, -8.28515", "Area of Interest" fields, "Display" checkboxes for "Data Product Info" and "Units", and a table of parameter information:

Parameter	Units	Data Product Info	TRMM	1997/12/31 - 2012/08/31
precipitation	mm/day	TRMM_3B42_daily.007	TRMM	

Generate Visualization

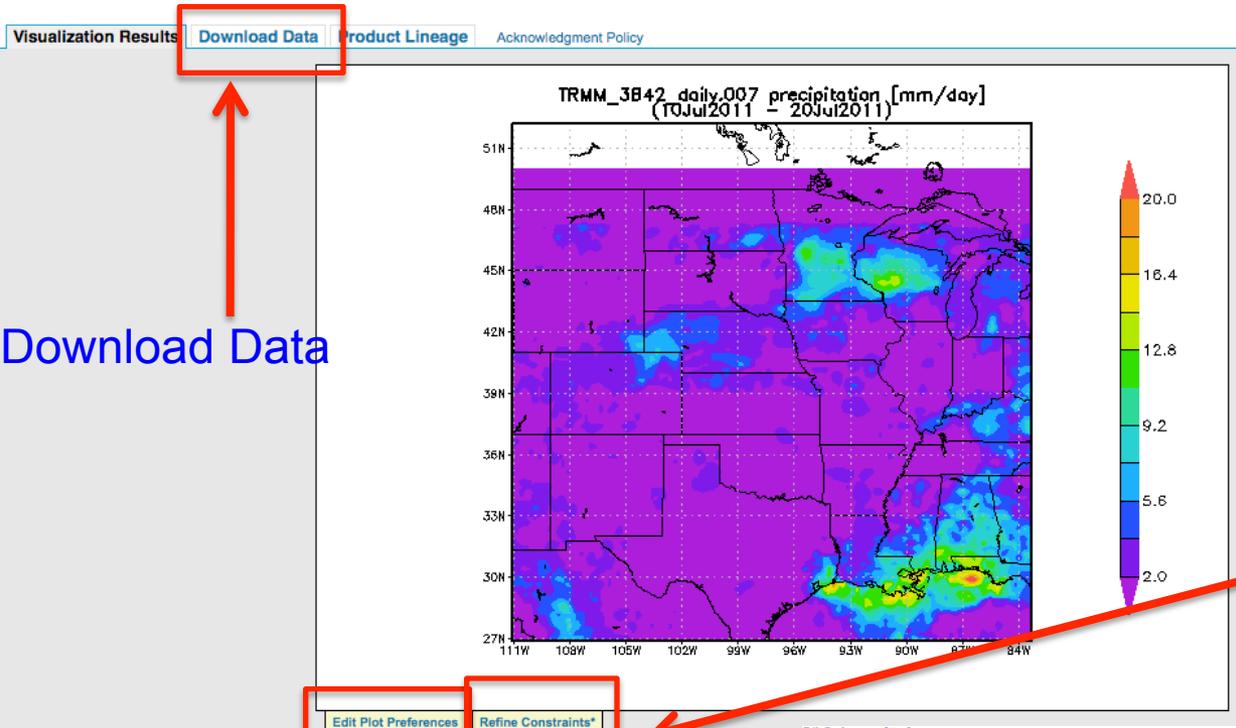
Temporal Selection

Visualization Selection

Spatial Selection

Parameter Selection

Giovanni: Visualization



Edit Preferences [Top]:

Plot Preferences

Image Width	<input type="text" value="700"/>	Set the width of the plot image (in pixels)
Image Height	<input type="text" value="500"/>	Set the height of the plot image (in pixels)
Decoration Flag	<input checked="" type="radio"/> Yes <input type="radio"/> No	Determine whether decorations (axes reticles, labels, etc.) are displayed for the resultant
Color Bar	Mode: <input type="radio"/> Dynamic <input type="radio"/> Pre-Defined <input checked="" type="radio"/> Custom Palette: <input type="text" value="Rainbow"/> Min Value: <input type="text" value="2"/> Max Value: <input type="text" value="20"/>	Select color map mode, select a palette, or, if shown in this preference bloc, specify min parameter value to map. The 'Palette' and Min/Max Value options are enabled only when mode is selected. Values entered for 'Min Value' and 'Max Value' will override parameter for parameter min and max, respectively. <i>Overrides ALL parameter min/max values.</i>
Projection	<input type="text" value="Equidistant Cylindrical"/>	Select a projection for the plot(s)
Smooth Flag	<input checked="" type="radio"/> Yes <input type="radio"/> No	Determine whether the pixel interpolation should use a smoothing routine
precipitation (TRMM_3B42_daily.007) Return to plot	Parameter Min: <input type="text" value="0.0"/> Parameter Max: <input type="text" value="200.0"/>	Set parameter preference values

Giovanni: Data Download Options

HDF, NCDF, ASCII Formats

[Visualization Results](#) **[Download Data](#)** [Product Lineage](#) [Acknowledgment Policy](#)

Download source data products and data products derived from Giovanni processing stages. For simplicity purposes, only the initial retrieval and final rendering phases are currently accessible for downloading. Supported download formats are HDF, NetCDF(NCD), ASCII, and KMZ (ASCII is available only when the array size is within about half-million points). To **download multiple files** at once, select the desired files (from any section) by clicking on their associated checkboxes, and then click 'Download in Batch'. Note: that 'n/a' means that a file size or other column value is not available; 'saa' means that a file is exactly the same as the previous one in the list. Also, not all services and data products support all download file formats.

Initial Data Retrieval

Data Product	Start Time	File Size (b)
TRMM_3B42_daily.007 (precipitation)	2011-07-10T00:00:00Z	626047
TRMM_3B42_daily.007 (precipitation)	2011-07-11T00:00:00Z	636034
TRMM_3B42_daily.007 (precipitation)	2011-07-12T00:00:00Z	652838
TRMM_3B42_daily.007 (precipitation)	2011-07-13T00:00:00Z	644246
TRMM_3B42_daily.007 (precipitation)	2011-07-14T00:00:00Z	632734

Download in Batch

Download Files

HDF NCD ASC

Two Dimensional Map Plot

Input Files	Start Time	File Size (b)
TRMM_3B42_daily.007 (precipitation)	2011-07-10T00:00:00Z	46608

Output Files	File Size (b)
precipitation.TRMM_3B42_daily.007.AreaMap.2011-07-10.gif	22597

Download in Batch

Download Files

HDF NCD ASC

KMZ

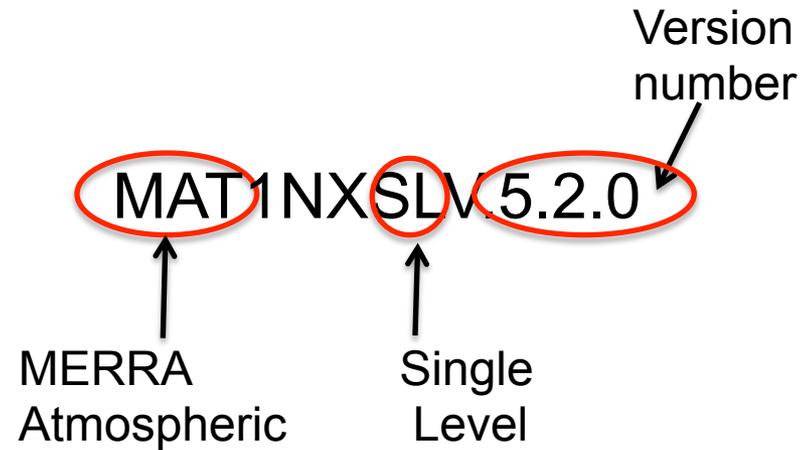
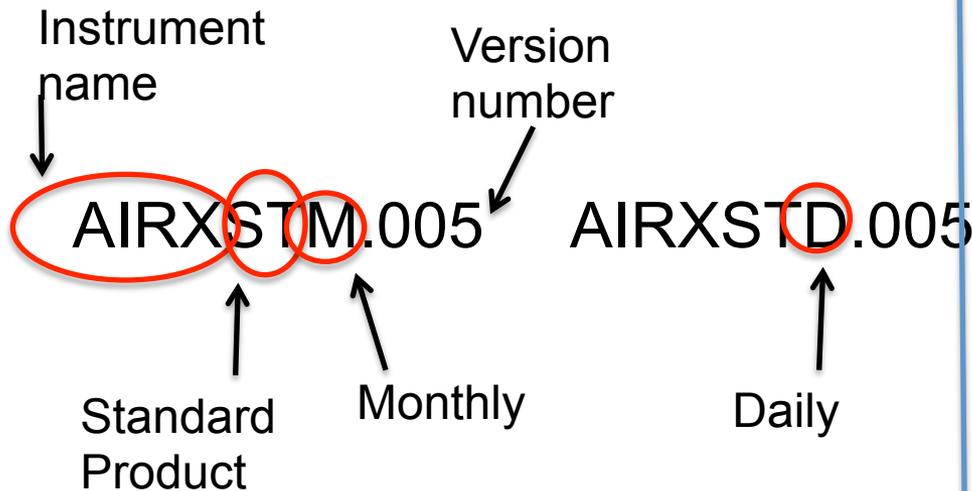
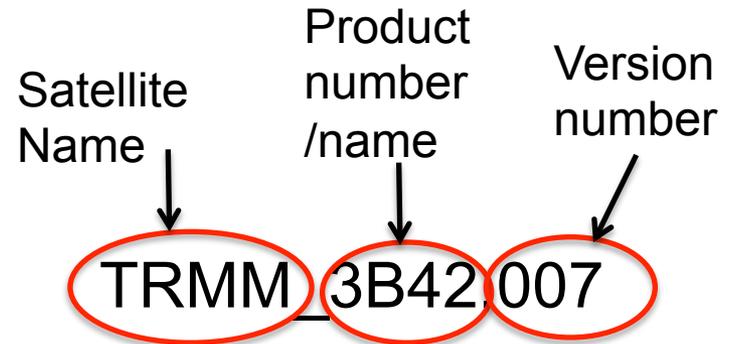
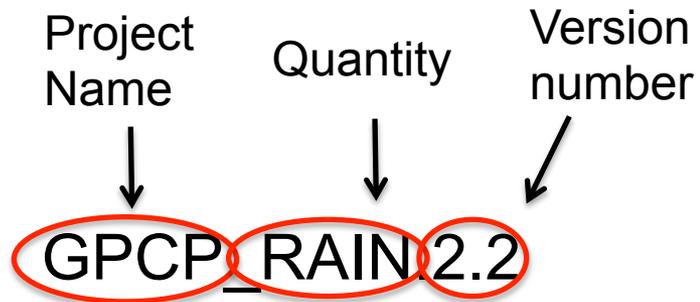
KMZ

GIF Image

Display on Google Map

Data Product Names: What to know?

Examples



What is MIRADOR ?

<http://mirador.gsfc.nasa.gov>

[Mirador](#) : is an earth science data search tool developed at the GES DISC. It has a simplified interface that allows spatial and temporal parameter subsetting, and an interactive shopping cart.

Mirador – Simple Search

<http://mirador.gsfc.nasa.gov/>

A simple, clean interface that employs the Google mini appliance for metadata keyword searches.

The screenshot shows the Mirador search interface. At the top, there is a NASA logo and the text 'National Aeronautics and Space Administration' and 'Goddard Earth Sciences Data and Information Services Center'. A search bar labeled 'Search DISC' is present with a '+ GO' button and a link to '+ Advanced Search'. Below this is a navigation bar with links for '+ ACDISC', '+ AgDISC', '+ A-TRAIN', '+ AIRS', '+ HURRICANES', '+ NEESPI', '+ OCEAN COLOR', and '+ PDISC'. On the left side, there is a sidebar with a 'Mirador' section containing links for '+ GES DISC Home', '+ OVERVIEW', '+ HELP CENTER', '+ DATA HOLDINGS', '+ VIEW CART', and '+ CHECK OUT'. Below this is an 'Additional Features' section with links for '+ News', '+ Restricted Data', '+ Feedback', and '+ FAQ'. The main content area features a header with 'Mirador Data Access Made Simple' and a breadcrumb trail 'You are here: Keyword Search'. The search form is titled 'SEARCH MIRADOR' and includes fields for 'Keyword' (with 'MA...', 'VA' visible), 'Location' (with 'chesapeake' visible), 'Time Span' (with 'From: Jan 1, 1989' and 'To: 12-31-2007' visible), and 'Event'. Below the search form, there is a list of available sensors: 'Available: AIRS, OMI, MLS, HIRDLS, TOMS, UARS, TRMM, GLDAS, SORCE, and Subsets from A-Train Sensors (e.g MODIS, AIRS, OMI and MLS)'. There is also a 'What's New' section with the text 'Download Files using HTTP protocol' and an 'Acknowledgements' section with links to 'National GeoSpatial Information Agency', 'Unisys', 'EPA', and 'Smithsonian Global Volcanism Program'. The OpenSearch logo is visible in the bottom right corner of the search area.

Mirador supports
Searching by:

Keyword

Time span

Location

Event

**Semantic
Mirador**

Mirador – Search <http://mirador.gsfc.nasa.gov/>

Search results lists all available data products that match criteria, along with product information and statistics.

The screenshot shows the Mirador search interface. On the left is a sidebar with navigation links: + GES DISC Home, Mirador, + OVERVIEW, + HELP CENTER, + DATA HOLDINGS, + VIEW CART, and + CHECK OUT. The main search area includes a 'Keyword' field with 'MERRA cloud precipitation', a 'Time Span' section with 'From' (1978-01-01 00:00:00) and 'To' (2003-12-03 23:59:59) fields, and a 'Location' dropdown set to 'Worldwide'. A 'Search GES-DISC' button is at the bottom of the sidebar. The main content area displays 'Data Sets' for 'MERRA cloud precipitation' with 'Results 1 - 2 of 2'. The first result is 'MERRA Chem 3D IAU States Cloud Precip, Time average 3-hourly (eta coord, 1.25x1L72) (MAT3FVCHM)', which is checked. It shows 'Approx. 3865 files found (321.802 MB)' and lists parameters: GEOPOTENTIAL HEIGHT, TERRAIN ELEVATION, LAND COVER, Spatial Resolution: 2 Degrees x 1.25 degrees, and Temporal Resolution: 1 Day(s). The second result is 'MERRA Chem 2D IAU Diagnostics, Fluxes and Meteorology, Time Average 3-hourly (surface, 1.25x1L1) (MAT3FXCHM)', which is unchecked. It shows 'Approx. 3865 files found (19.296 MB)' and similar parameters. At the bottom of the search results are buttons for 'Select All', 'Reset', 'List Selected Files By Time', 'See Timeline View', and 'Add Selected Files To Cart'. Below the buttons is the text 'NASA Search Results (Number of files found may not be entirely accurate)' and 'Page: 1'.

Viewable and downloadable granule lists for each product.

Spatial and Parameter Subsetting

The screenshot shows the Mirador file listing interface. On the left is a sidebar with navigation links: + GES DISC Home, Mirador, + OVERVIEW, + HELP CENTER, + DATA HOLDINGS, + VIEW CART, and + CHECK OUT. The main search area includes a 'Keyword' field with 'MERRA cloud precipitation', a 'Time Span' section with 'From' (1978-01-01 00:00:00) and 'To' (2003-12-03 23:59:59) fields, and a 'Location' dropdown set to '(-90,-180),(90,180)'. A 'Search GES-DISC' button is at the bottom of the sidebar. The main content area displays 'File Listing For MAT3FVCHM' with 'Results 1 - 15 for MERRA cloud precipitation (1 second)'. The first result is 'MERRA Chem 3D IAU States Cloud Precip, Time average 3-hourly (eta coord, 1.25x1L72)'. Below the search results is a table with columns 'Descriptive File Names', 'File Name', and 'Start Time'. The table has a 'Select All' checkbox and a 'Sort by Time: Ascending | Descending' dropdown. The table contains four rows of data, each with a checked 'Select All' checkbox, a file name, and a start time. Below the table are buttons for 'Download Now: [Data] [Metadata]' for each row. At the bottom of the table is an 'All' button.

Descriptive File Names:	File Name	Start Time
<input checked="" type="checkbox"/>	MERRA300.prod.assim.tavg3_3d_chm_Fv.20001231.hdf (316.53 MB)	2000-12-31 00:00:00
<input checked="" type="checkbox"/>	MERRA300.prod.assim.tavg3_3d_chm_Fv.20001230.hdf (317.05 MB)	2000-12-30 00:00:00
<input checked="" type="checkbox"/>	MERRA300.prod.assim.tavg3_3d_chm_Fv.20001229.hdf (317.16 MB)	2000-12-29 00:00:00
<input checked="" type="checkbox"/>	MERRA300.prod.assim.tavg3_3d_chm_Fv.20001228.hdf (315.74 MB)	2000-12-28 00:00:00

Mirador – Checkout

Checkout offers multiple ways to download the data:

Java-based Downloader

URL List

FTP Batch Script

On The Fly Tar

DownThemAll

The screenshot shows the Mirador 2.11 checkout interface. At the top, it says "Data Access Made Simple". Below that, a yellow box contains the message "Your cart is now empty." The main heading is "CHECKOUT - CHOOSE FROM DOWNLOAD OPTIONS:". There are five main options, each with a corresponding button and description:

- JAVA-BASED DOWNLOADER**: A green oval highlights this option. A green arrow points from the text "Java-based Downloader" on the right to this option. Below the heading is a "Download" button and a paragraph of text describing JDataDownloader as a platform-independent HTTP and FTP client.
- URL LIST FOR USE WITH DATA TRANSFER CLIENTS (WGET, CURL, ETC.)**: An orange oval highlights this option. An orange arrow points from the text "URL List" on the right to this option. Below the heading are three buttons: "Download Data only", "Download XML only", and "Download DATA and XML".
- FTP BATCH SCRIPT**: A purple oval highlights this option. A purple arrow points from the text "FTP Batch Script" on the right to this option. Below the heading are three buttons: "Download Data only", "Download XML only", and "Download DATA and XML". Underneath, there are instructions for running the script on SGI/Linux, DOS/SunOS, and Windows/Mac platforms.
- ON THE FLY TAR**: A red oval highlights this option. A red arrow points from the text "On The Fly Tar" on the right to this option. Below the heading is a button "Download from goldsmr3.sci.gsfc.nasa.gov" and a note about restarting the download if interrupted. A paragraph below explains that On The Fly TAR allows downloading all files to a single tar file.
- DOWNTHEMALL**: A blue oval highlights this option. A blue arrow points from the text "DownThemAll" on the right to this option. Below the heading is a paragraph stating that DownThemAll is a Firefox download manager plugin. At the bottom, there is a "Get it here" link with a "downTHEMall!" logo and a "URL Page" button for use with DownThemAll.

Flood Mapping

TRMM Near-real Time Flood and Landslide Information Tool

(http://trmm.gsfc.nasa.gov/publications_dir/potential_flood_hydro.html)

TRMM Potential Flood Areas

m.gsfc.nasa.gov/publications_dir/potential_flood_hydro.html

Latest Headlines Yahoo! Utton Center

TRMM HOME

+ ABOUT TRMM + NEWS + PUBLICATIONS + SEARCH TRMM + CONTACTS + DATA + IMAGE POLICY

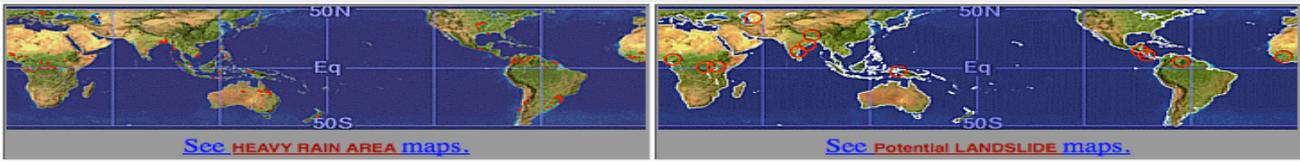
Current Heavy Rain, Flood and Landslide Estimates

(Rain information from Real-Time TRMM Multi-Satellite Precipitation Analysis [TMPA/3B42])

See [TEXT REPORT](#) of areas [with estimates of severe flooding](#) near weather station locations

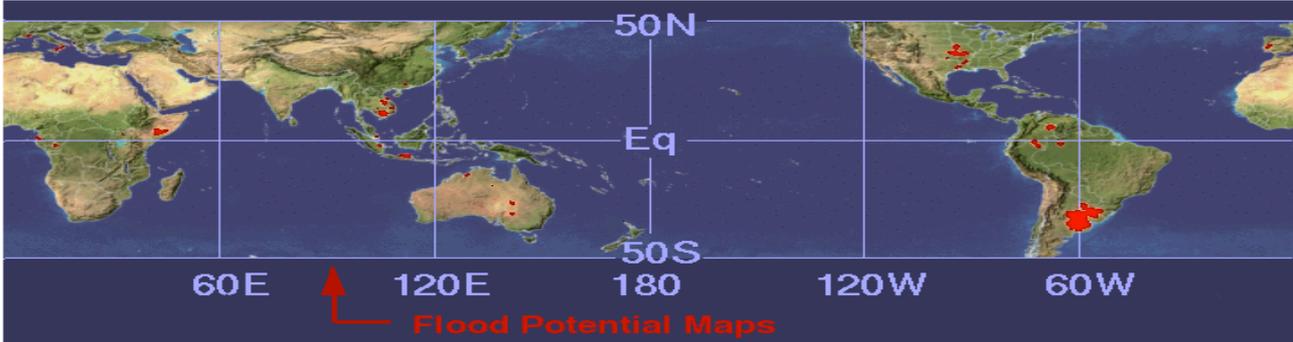
10 NOV 2011 0000 UTC
(Observation Time of Last Data Processed)

Point & Click 24 HR Rain Values	Point & Click 72 HR Rain Values	Point & Click 168 HR Rain Values
---	---	--



[See HEAVY RAIN AREA maps.](#) [See Potential LANDSLIDE maps.](#)

Click on the maps below for **regional displays** with more information



Flood Potential Maps

Based on the CREST Hydrological Model

TRMM Near-real Time Flood and Landslide Information Tool

(http://trmm.gsfc.nasa.gov/publications_dir_potential_flood_hydro.html)

- Global Flood & Landslide Monitoring is a very useful site for observing maps of heavy rain, floor, and landslide estimates globally
- Clicking on any of the maps brings the user to more in depth analysis by region
- The user can also download the data into Google Earth

Global Flood & Landslide Monitoring

TRMM Tropical Rainfall Measuring Mission

ABOUT TRMM | NEWS | PUBLICATIONS | SEARCH TRMM | CONTACTS | DATA | IMAGE POLICY

Current Heavy Rain, Flood and Landslide Estimates

(Rain information from Real-Time TRMM Multi-Satellite Precipitation Analysis [TMPA/3B42])

NOTICE: See New GOOGLE EARTH Download (KML) http://trmm.gsfc.nasa.gov/trmm_rain/Events/trmm_google_hydro_model_h.kml

See TEXT REPORT of areas with estimates of severe flooding near weather station locations

8 JUN 2010 0900 UTC
(Observation Time of Last Data Processed)

Point & Click 24 HR Rain Values | Point & Click 72 HR Rain Values | Point & Click 168 HR Rain Values

See HEAVY RAIN AREA MAPS | See Potential LANDSLIDE MAPS

(CLICK TO SEE) TROPICAL CYCLONE HARGIS QUICKTIME ANIMATION (14.3 MB)
(CLICK TO SEE) TROPICAL CYCLONE HARGIS MPEG ANIMATION (3.8 MB)

Click on the maps below for regional displays with more information

Flood Potential Using Hydrological Model

A Relevant publication (pdf) for the hydrological model shown above is: Hong, Y., R. F. Adler, F. Hossain, S. Curtis, and G. J. Huffman (2007), **A First Approach to Global Runoff Simulation using Satellite Rainfall Estimation**, *Water Resources Research*, Vol. 43, No. 8, W08502, doi: 10.1029/2006WR005739

Click to see a FULL GLOBE HYDROLOGICAL MODEL FLOOD POTENTIAL IMAGE | Click to see a SMALLER FULL GLOBE HYDROLOGICAL MODEL FLOOD POTENTIAL IMAGE

Seven Days of Rainfall

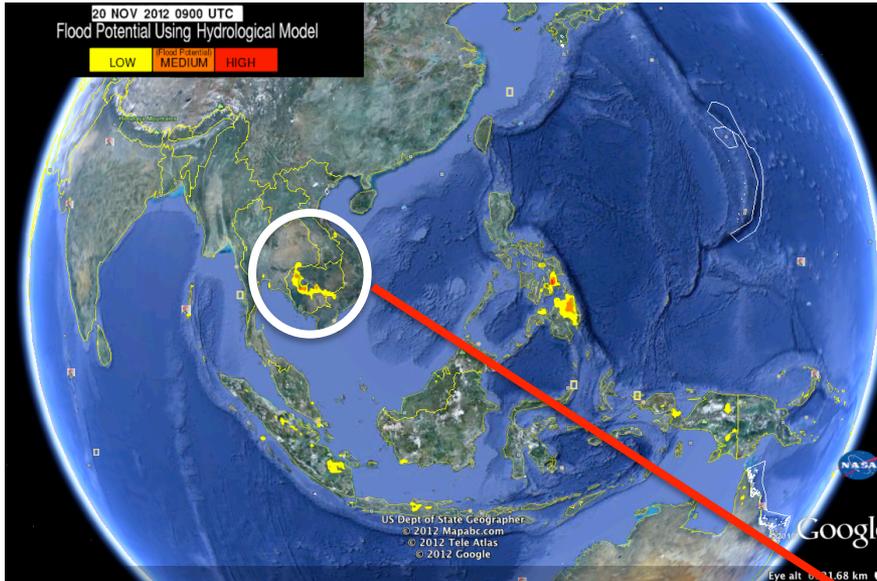
GOOGLE EARTH DOWNLOADS

CLICK on the KML file below to download a file which show a REAL-TIME FLOOD POTENTIAL image using GOOGLE EARTH.

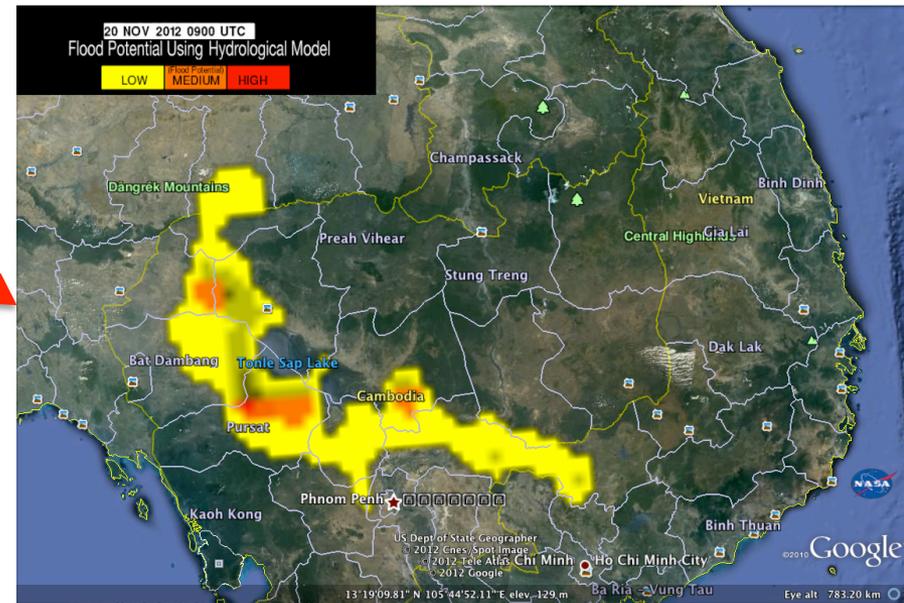
Updated October 31, 2008 (Note: you must have Google Earth installed in order to be able to load these KML files.)
http://trmm.gsfc.nasa.gov/trmm_rain/Events/trmm_google_hydro_model_h.kml

TRMM Near-real Time Flood and Landslide Information Tool

(http://trmm.gsfc.nasa.gov/publications_dir/potential_flood_hydro.html)



Flood Potential on Google Earth



MODIS Inundation Mapping

<http://oas.gsfc.nasa.gov/floodmap/>



National Aeronautics and Space Administration



NRT Global MODIS Flood Mapping

Home

Algorithm

Product Description

Data Download

Multimedia

Future Upgrades & Enhancements

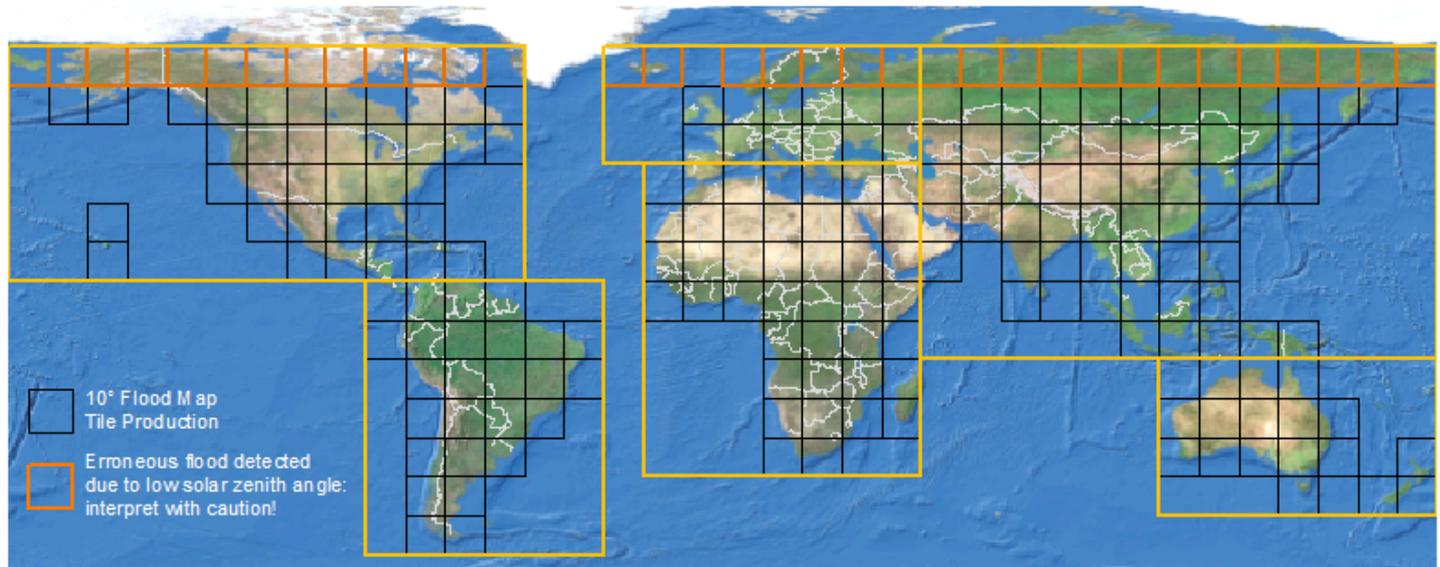
News/Status

Mailing list

To subscribe to our mailing list to receive email notification of updates, please, [click here](#).

Global Map

Real-time feed of processed tiles available at: modis.geobliti.com/modis/geoactivities.atom



For more information, please contact floodmap at lists.nasa.gov

MODIS Inundation Mapping

NRT Global MODIS Flood Mapping

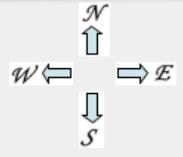
- Home
- Algorithm
- Product Description
- Data Download
- Multimedia
- Future Upgrades & Enhancements
- News/Status
- Mailing list

2 Days Composite | 1 Day Composite

-- June 2012 --

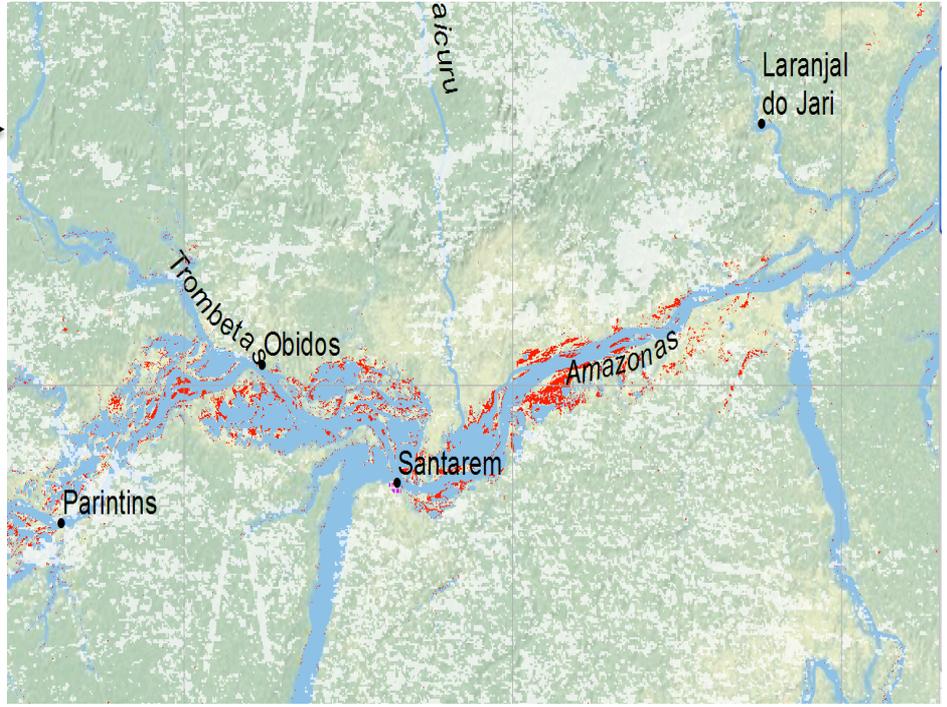
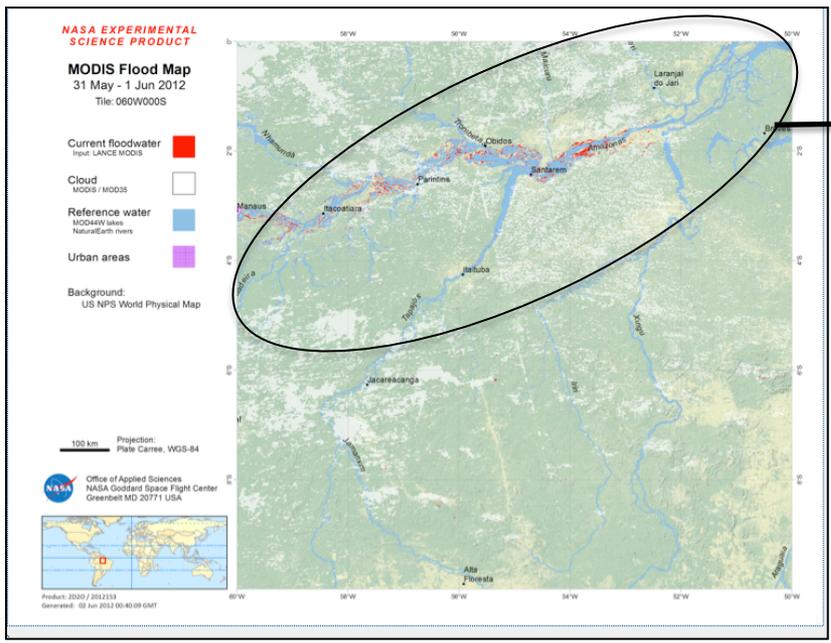
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Products	Available Downloads	
MODIS Flood Map	MFM	png
MODIS Flood Water	MFW	shapefile (.zip) KMZ
MODIS Surface Water	MSW	shapefile (.zip) KMZ
MODIS Water Product	MWP	geotiff
README (for all products)		pdf txt



Archive

Check slide show for the last 10 days.



Dartmouth Flood Observatory

<http://floodobservatory.colorado.edu/>

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Archive of
Large
Floods,
1985-Present](#)

- [Global
and
Regional
Analyses](#)

[Master Index
of
Inundation
Maps](#)

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Water
Record](#)

[River Watch](#)

[Other Flood
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Tools](#)

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Maps](#)

Dartmouth Flood Observatory

Space-based Measurement and Modeling of Surface Water
For Research, Humanitarian, and Water Management Applications

Flood Observatory Director: [Prof. G. Robert Gochis](#)

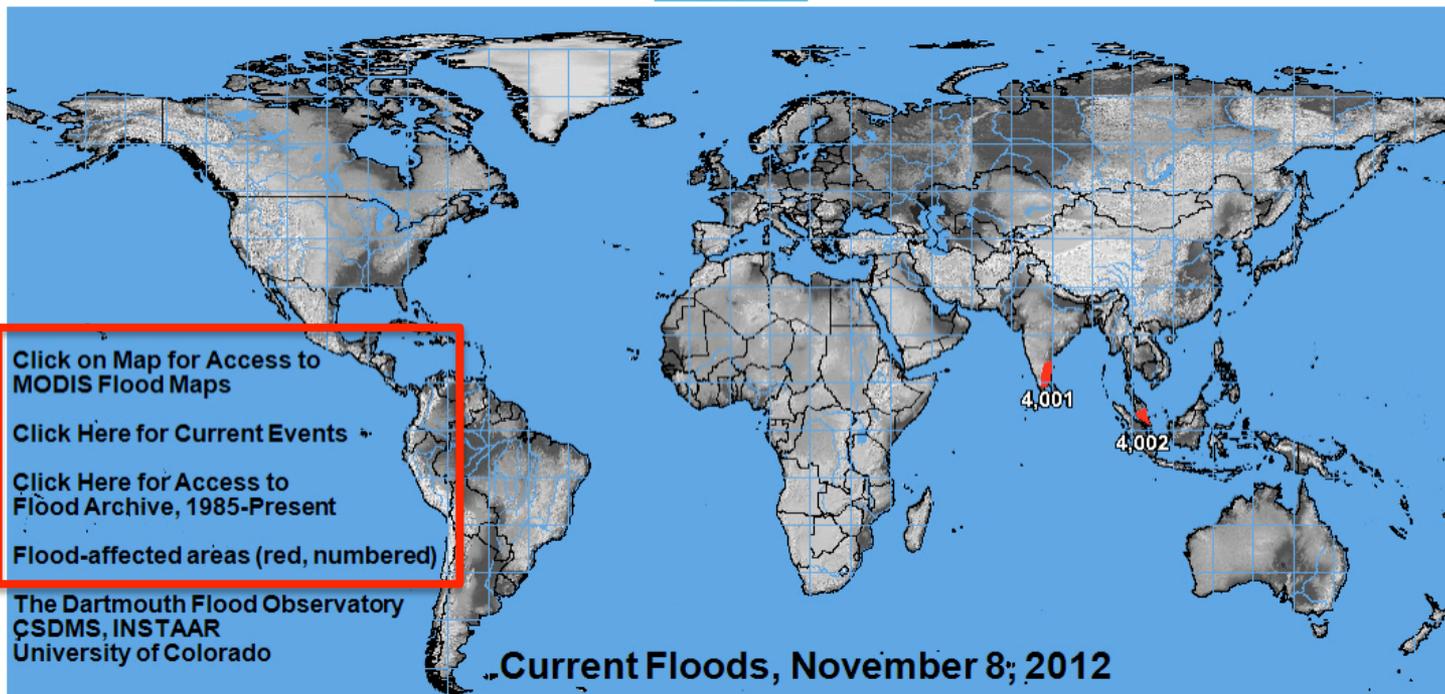
[Mission Statement](#)

[Satellite Data: Imaging of Hurricanes, Sandy-related storm surge, and other flooding](#)

[University Surface Flooding Warning System](#)

University of Colorado, Campus Box 500, Boulder, CO 80508 USA

[Let us know how you use information from this site!](#)



Access to Environmental Satellite-based River Discharge Measurements

Drought Information

U. S. Drought Portal

<http://www.drought.gov/portal/server.pt/community/drought.gov/>

Browser tabs: drought.gov, TRMM Online Visualization and ...

Address bar: www.drought.gov/portal/server.pt/community/drought.gov/202

Navigation: Most Visited, Getting Started, Latest Headlines, Yahoo!, સર્ચી રી



National Integrated Drought Information System

U.S. Drought Portal

www.drought.gov

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Search:

On or about September 25, 2012, the US Drought Portal will release a newly designed website. The new design keeps all existing information while also incorporating feedback received from the web as well as from formal surveys of users. The new design includes improved navigation and updated and new sources of information. The old site will be available alongside the new design for a limited time.

HOME | WHAT IS NIDIS? | CURRENT DROUGHT | FORECASTING | IMPACTS | PLANNING | EDUCATION | RESEARCH | RECOVERY | REPORTS

Area Drought Information

Select State... >> Go

Select Region... >> Go

Maps & Tools

- Map & Data Viewer - new!
- Geodata Portal
- Drought Monitor Graphics
- CRN Soil Data

Events & Announcements

- Public Health Implications of Drought Webinar 8/22/12
- Carolinas DEWS Scoping Workshop July 2012
- April 2012 Southern Plains Drought Assessment & Outlook Forum
- Risk Management Meeting 11/2011
- ACF Climate Outlook Forum and Pilot Review Meeting 2011
- Engaging Preparedness Communities

Featured Products

[Where are Drought Conditions Now?](#) | [How is the Drought Affecting Me?](#) | [Will the Drought Continue?](#)

U.S. Drought Monitor

November 13, 2012
Valid 7 a.m. EST

Intensity:
D0 Abnormally Dry
D1 Drought - Moderate
D2 Drought - Severe (e.g. agriculture, grasslands)
D3 Drought - Extreme
D4 Drought - Exceptional

Drought Impact Types:
S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu/>

USDA
Released Thursday, November 15, 2012
Author: David Miskus, NOAA/NWS/NCEP/CPC

Regional Drought Early Warning Systems (DEWS)

Federal Drought Assistance

Click here for information on resources available to help aid in the recovery from this year's drought.

NIDIS Feature

U. S. Drought Portal : Features

<http://www.drought.gov/portal/server.pt/community/drought.gov/>

The screenshot shows the website's navigation and content areas. A red box highlights the 'Maps & Tools' section, which includes links for 'Map & Data Viewer - new!', 'Geodata Portal', 'Drought Monitor Graphics', and 'CRN Soil Data'. Other visible sections include 'Area Drought Information' with state and region selection dropdowns, and 'Events & Announcements' with a list of recent events.

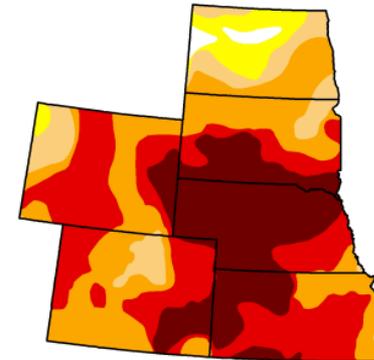
Regional Information

U.S. Drought Monitor High Plains

November 13, 2012
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	1.20	98.80	93.88	84.32	55.92	25.71
Last Week (11/06/2012 map)	0.03	99.97	96.46	83.94	57.54	27.24
3 Months Ago (08/14/2012 map)	4.48	95.52	86.05	76.97	49.64	15.52
Start of Calendar Year (12/27/2011 map)	61.66	38.34	18.12	7.22	2.07	0.04
Start of Water Year (09/25/2012 map)	0.00	100.00	98.91	83.80	61.28	24.35
One Year Ago (11/08/2011 map)	64.69	35.31	22.41	12.87	6.19	2.59



NDMC's Drought Impact Reporter



6-week animation



12-week animation



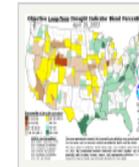
Custom DM animation



short-term drought indicator blends



long-term drought indicator blends



U. S. Drought Portal

What You See

D0-D4: The Drought Monitor summary map identifies general drought areas, labelling droughts by intensity, with D1 being the least intense and D4 being the most intense. D0, drought watch areas, are either drying out and possibly heading for drought, or are recovering from drought but not yet back to normal, suffering long-term impacts such as low reservoir levels.

S and L: Since "drought" means a moisture deficit bad enough to have social, environmental or economic effects, we generally include a description of what the primary physical effects are:

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically more than 6 months (e.g. hydrology, ecology)

The Thinking Behind the Map

Drought intensity categories are based on five key indicators and numerous supplementary indicators. The accompanying drought severity classification table shows the ranges for each indicator for each dryness level. Because the ranges of the various indicators often don't coincide, the final drought category tends to be based on what the majority of the indicators show. The analysts producing the map also weight the indices according to how well they perform in various parts of the country and at different times of the year. Also, additional indicators are often needed in the West, where winter snowfall has a strong bearing on water supplies.

Drought Severity Classification

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Short and Long-term Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30	21-30	-0.5 to -0.7	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20	11-20	-0.8 to -1.2	11-20
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10	6-10	-1.3 to -1.5	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5	3-5	-1.6 to -1.9	3-5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2	0-2	-2.0 or less	0-2

Short-term drought indicator blends focus on 1-3 month precipitation. Long-term blends focus on 6-60 months. Additional indices used, mainly during the growing season, include the USDA/NASS Topsoil Moisture, Keetch-Byram Drought Index (KBDI), and NOAA/NESDIS satellite Vegetation Health Indices. Indices used primarily during the snow season and in the West include snow water content, river basin precipitation, and the Surface Water Supply Index (SWSI). Other indicators include groundwater levels, reservoir storage, and pasture/range conditions.

Global Drought Monitor

<http://drought.mssl.ucl.ac.uk/>

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[Drought Severity](#)

[Classification](#)

[Standardized](#)

[Precipitation Index](#)

[Palmer Drought](#)

[Severity Index](#)

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[Data](#)

[Useful Links](#)

[Acknowledgements](#)

[Contacts](#)

Global Drought Monitor

Data Sources

Precipitation

Monthly mean precipitation (1986 to date) is provided by the [Global Precipitation Climatology Centre](#) at [Deutscher Wetterdienst](#).

Temperature

Monthly mean 2m air temperature is taken from the [ECMWF](#) operational forecast (2002 to date). Historic data (1958-2001) are from the [ERA40](#) reanalysis. Both data sets are provided by the British Atmospheric Data Centre, from their website at <http://www.badc.rl.ac.uk>

Soil Water Holding Capacity

Soil water holding capacity is taken from the NASA/GISS analysis of Bouman et al (1986) which is supplied by the United Nations Environmental Programme as dataset [GNV25](#).

Base Map

ESRI World Basemap from <http://www.esri.com/data/download/basemap>

Rivers

Global stream network HYDRO1K from the US Geological Survey <http://edc.usgs.gov>

Population

Gridded Population of the World version 2. These data have been adjusted to match the UN national estimated population for each country in 1995. Available from <http://sedac.ciesin.columbia.edu/plue/gpw/index.html?main.html&2>

Global Agricultural Monitoring

<http://www.pecad.fas.usda.gov/glam.cfm>



United States Department of Agriculture
Foreign Agricultural Service

Linking U.S. Agriculture  to the World

FAS employs about 420 people covering food and agricultural production, consumer trends, and trade issues in about 130 countries. [Show Factoids](#)



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GLAM—Global Agricultural Monitoring

A collaboration between NASA/GSFC, USDA/FAS, SSAI, and UMD Department of Geography



[Project Background Mission and Goals](#)
[Project Components](#)
[Contact Information & Links](#)

The Global Agriculture Monitoring brochure in [PDF format](#).

Project Background Mission and Goals

Project Background NASA/USDA MOU

The U.S. Department of Agriculture (USDA) and the National Aeronautics and Space Administration (NASA) recently signed a Memorandum of Understanding (MOU) to strengthen future collaboration. In support of this collaboration, NASA and the USDA Foreign Agricultural Service (FAS) jointly funded a new project to assimilate NASA's Moderate Resolution Imaging Spectroradiometer (MODIS) data and products into an existing decision support system (DSS) operated by the International Production Assessment Division (IPAD) of FAS. Building on NASA's investment in the MODIS Science Team, the project is implementing a user-friendly system that will allow for the integration and analysis of MODIS data products in IPAD's DSS.

FAS Mission & Tasks

FAS promotes the security and stability of U.S. food supply, improves foreign market access for U.S. agricultural products, reports on world food security, and advises the U.S. government on international food aid requirements.

FAS bears the primary responsibility for USDA's overseas activities: market development, international trade agreements and negotiations, and the collection and analysis of statistics and market information. It also administers USDA's export credit guarantee and food aid programs, and helps increase income and food availability in developing nations by mobilizing expertise for agriculturally led economic growth.

Search FAS

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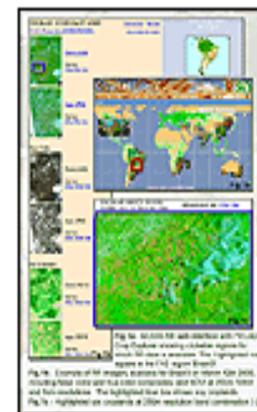
Global Agricultural Monitoring

<http://www.pecad.fas.usda.gov/glam.cfm>

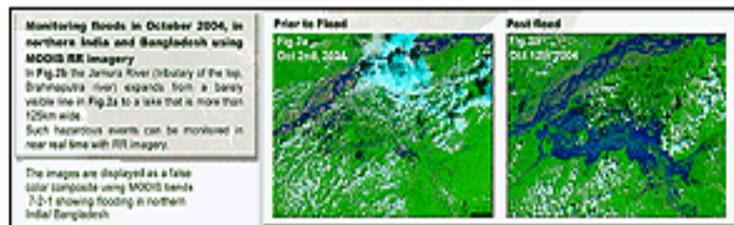
MODIS Rapid Response

The MODIS Rapid Response (RR) system provides rapid access to MODIS data collected twice daily from the Terra satellite in the morning (10:30am) and the Aqua satellite in the afternoon (2:30pm).

The RR system provides FAS analysts with access to georeferenced, calibrated, mosaicked daily global MODIS imagery for FAS regions of interest within 2-4 hours of satellite acquisition. RR data are available to FAS analysts at spatial resolutions of 250m, 500m and 1km in different band combinations.



Such rapidly accessible data allows the FAS analysts to evaluate, and assess, in near real time, the effect of disaster events on crops.



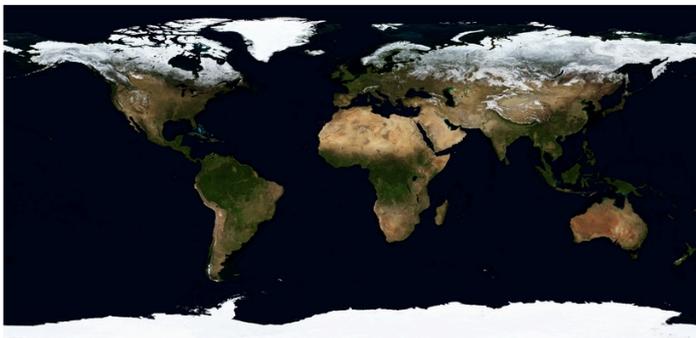
MODIS Viewers

MODIS/NDVI Interactive Analysis

Global Agricultural Monitoring

250-meter MODIS/ NDVI Time Series Database from the
Global Agriculture Monitoring (GLAM) Project
Please select your region of interest by clicking on the globe
Click For Help or selecting from the list

MODIS NDVI



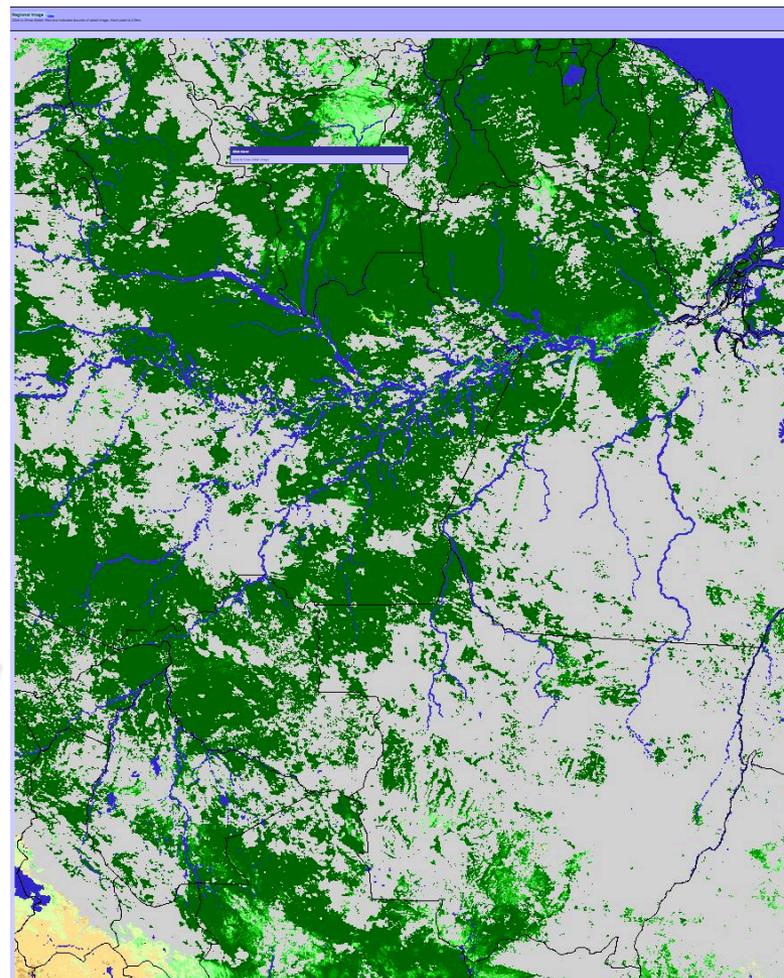
[Dataset Status](#) • [Feedback](#) • Version 0.3.12 (11/10/2012)



Image **NDVI** NDWI View (621) ?
Graph **NDVI** NDWI ?

- (0 to .10) Sparse Vegetation
- (.11 to .20)
- (.21 to .30)
- (.31 to .40)
- (.41 to .50)
- (.51 to .60)
- (.61 to .70) Dense Vegetation
- (.71 to 1.00)
- Water
- No Data

Brazil, Northwest
2012-Oct-31 to Nov-15
UL: 5.68933° -69.17442°
LR: -18.36750° -49.00907°



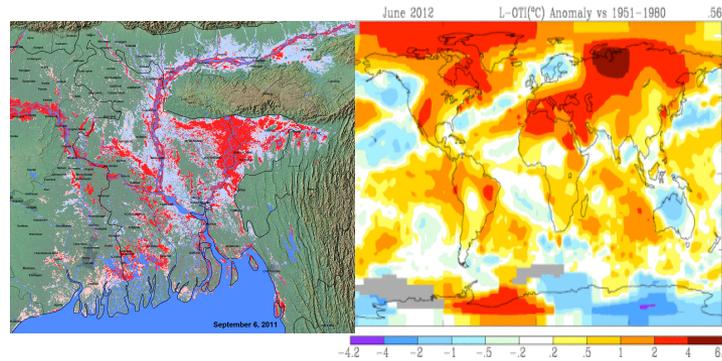
What Next?

Week 1



**Intro. & Background:
Satellite Remote Sensing**

Week 2



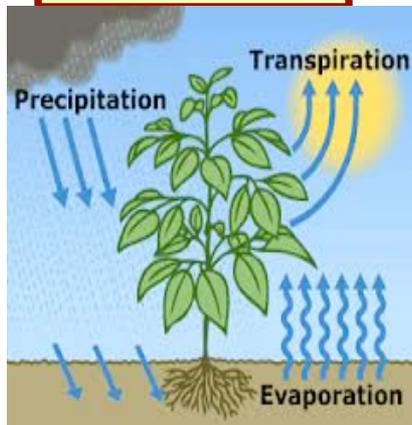
**Flood and Drought
[Rainfall, Weather
and Climate Data]**

Week 3



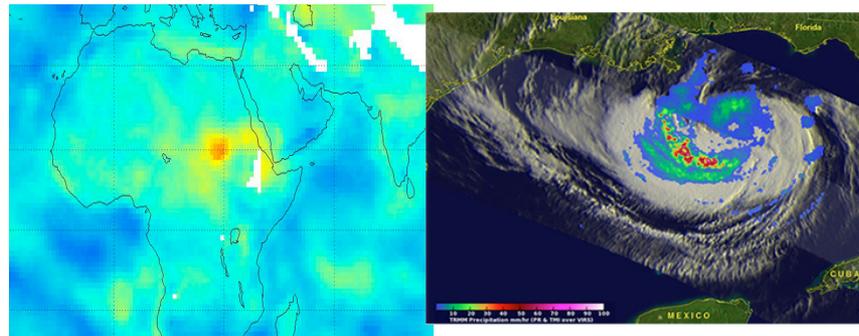
Web-tools

Week 4



Evapotranspiration

Week 5



Data Applications/ Case Studies

Next Q/A sessions: November 21 (8-9 a.m. EST)

Thank You!