

Event Explorer (Prototype)

Ongoing NASA AIST Funded Research Project

Joint Collaboration
MSFC, GSFC, RPI, UAH

What is Event Explorer?

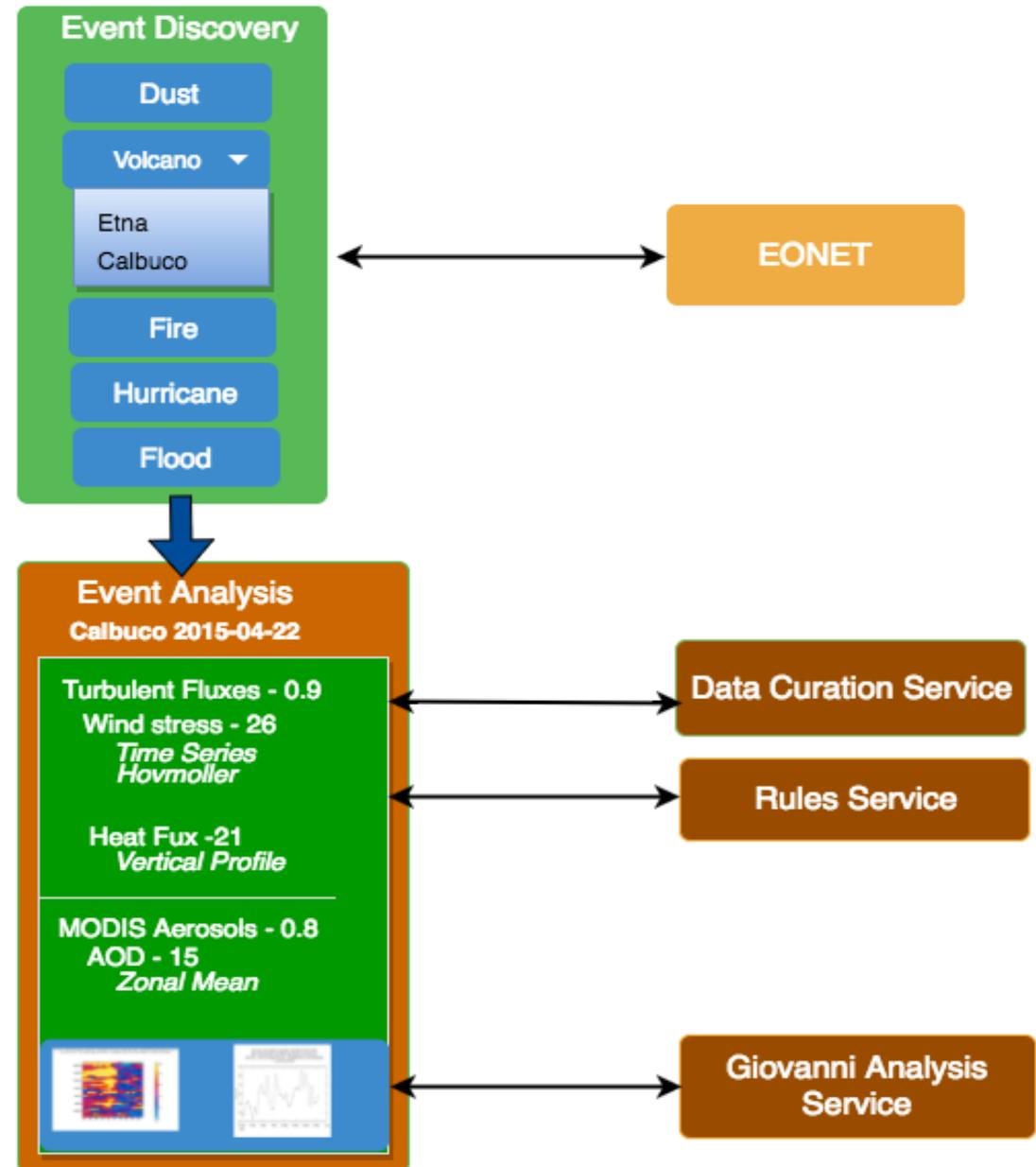
- Single tool that enables user to “quickly”:
 - Select an “event of interest”
 - Automatically generates exploratory analysis plots using the right data sets and variables

Why present at a UWG?

- Assessment
 - Value of the tool
 - Is this something that would be useful as tool at different DAACs including GHRC?
 - Application scenarios?
 - Correctness
 - Is it working correctly?
 - Functionality/Ease of use?
- Guidance on how to move forward

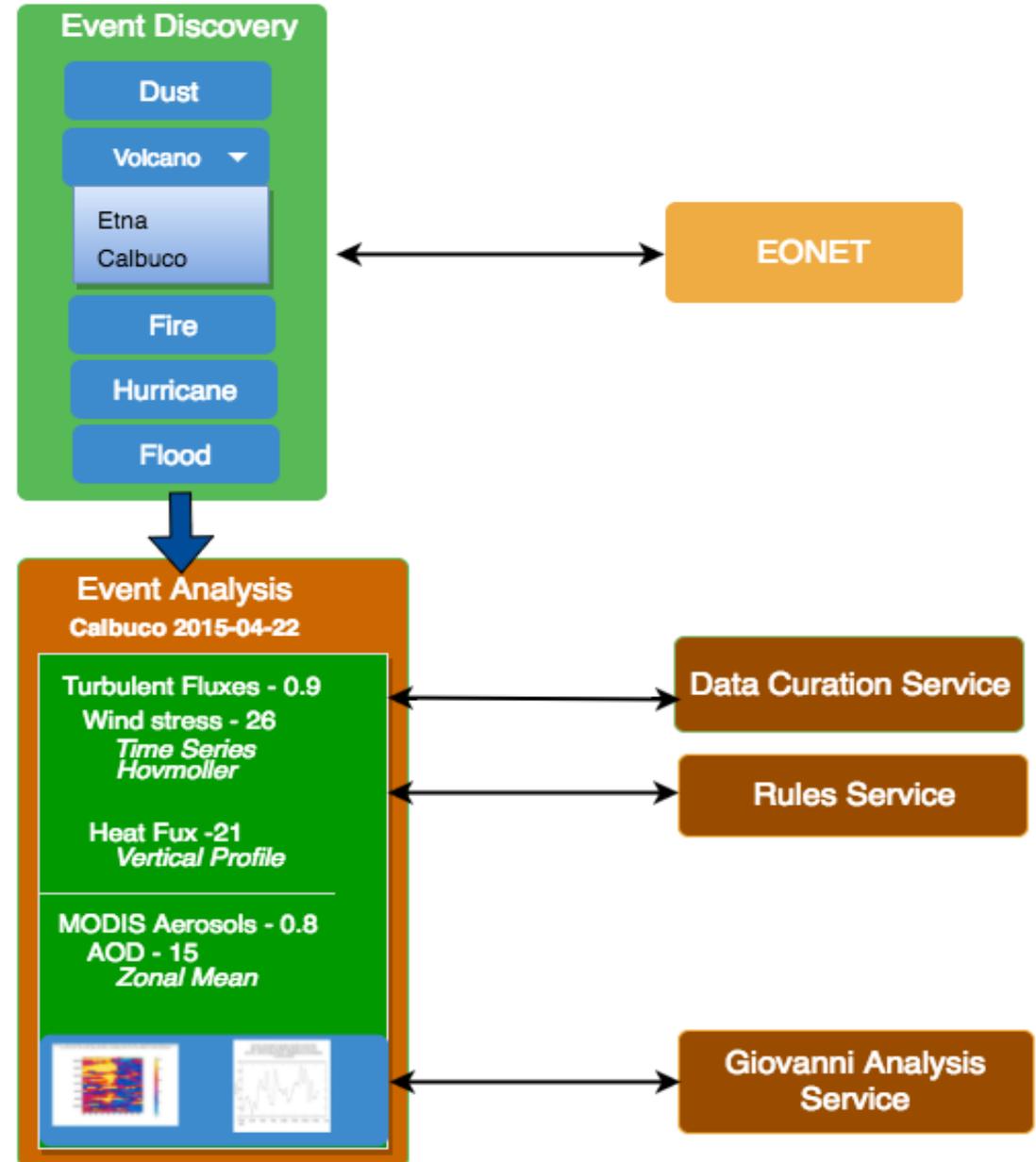
Event Explorer

- Allows user to select an event from an existing (and growing) event database
- Selects both data parameters and plotting options to the users
- Given event location data is subsetting 10 degrees into each of the S,N,W,E directions and the time range



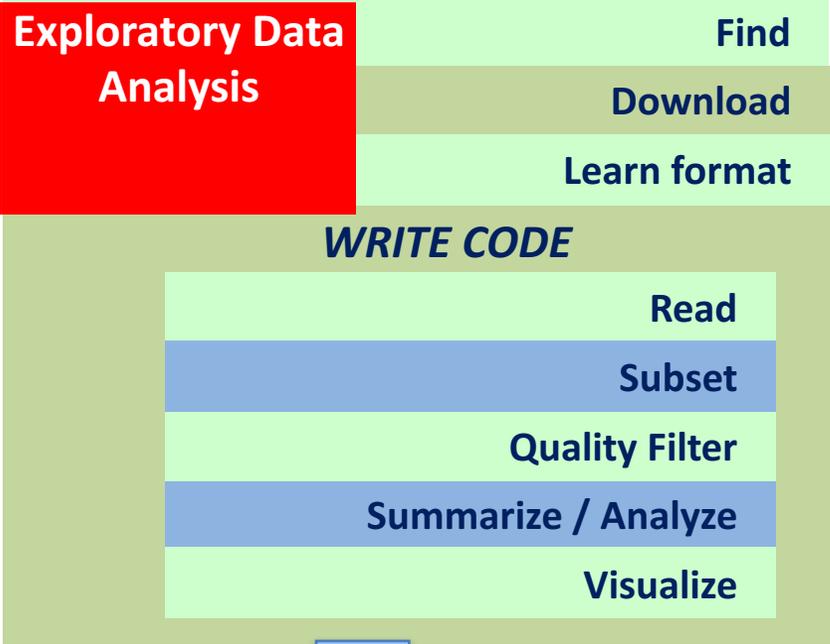
Event Explorer Components

- EONET event database
- *Data Curation Service – suggests relevant data set and parameter*
- *Rules Service – suggests correct analysis plots*
- Giovanni – analysis tool

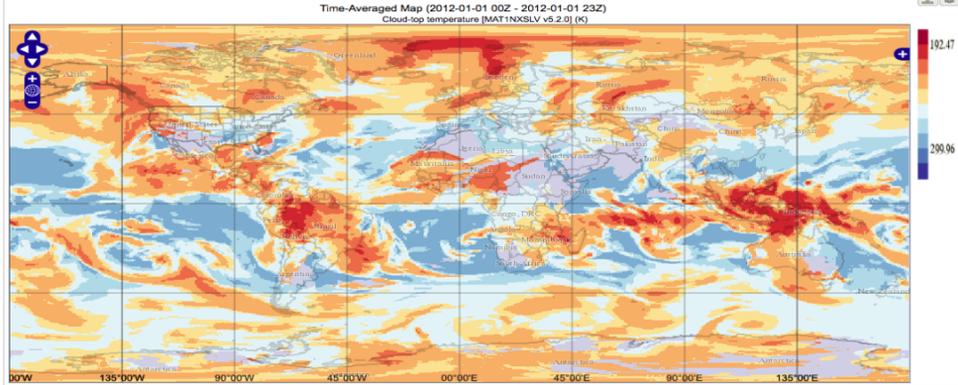
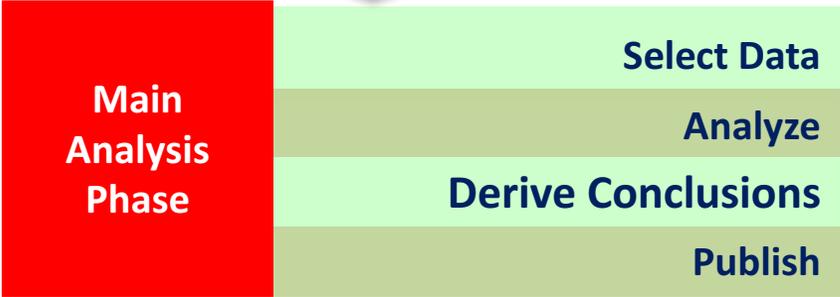
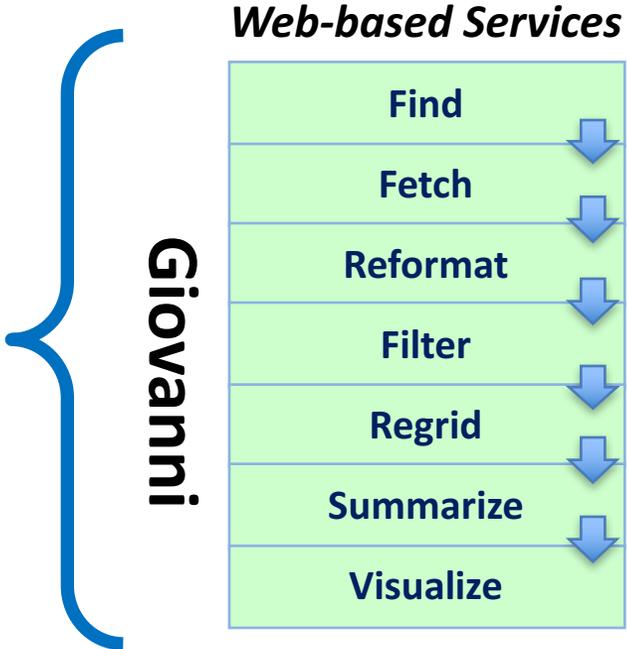


Quick Introduction to Giovanni

Giovanni Visualization and Analysis Tool



Giovanni provides *Server-Side, Quick-Start Exploratory Data Analysis:*
 no coding necessary
 no downloads necessary



Giovanni User Interface

GIOVANNI The Bridge Between Data and Science v 4.20.5 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

OMUVBd variables have been temporarily removed from the Giovanni catalog... [1 of 4 messages] [Read More](#)

Select Plot

Maps: Time Averaged Map
 Comparisons: Select...
 Time Series: Select...
 Vertical: Select...
 Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD HH:mm
 2005 -08 -28 00 :00 to 2005 -09 -01 23 :59

Valid Range: 1997-12-31 to 2016-04-30

Select Region (Bounding Box or Shapefile)

Format: West, South, East, North

Watersheds : Mississippi - Missouri

Select Variables

Disciplines

- Atmospheric Dynamics (14)
- Cryosphere (1)
- Hydrology (88)
- Water and Energy Cycle (65)

Measurements

- Air Pressure (21)
- Air Temperature (21)
- Albedo (6)
- Atmospheric Moisture (22)
- Canopy Water Storage (3)
- Cloud Properties (2)
- Energy (3)
- Evaporation (33)
- Evapotranspiration (31)
- Heat Flux (69)
- Height, Level (2)
- Incident Radiation (51)
- Latent Heat Flux (1)
- Latent Heat (1)
- Precipitation (88)

Number of matching Variables: 88 of 1298

Total Variable(s) included in Plot: 1

Keyword :

	Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units	Vert. Slice
<input checked="" type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v7)	TRMM	Daily	0.25 °	1997-12-31	2016-04-30	mm/day	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-01	2016-08-06	kg/m^2	-
<input type="checkbox"/>	Precipitation Monthly Total (NLDAS_FORA0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-01	2016-05-31	kg/m^2	-
<input type="checkbox"/>	Convective Precipitation Monthly Total (NLDAS_FORA0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-01	2016-05-31	kg/m^2	-
<input type="checkbox"/>	Rainfall (unfrozen precipitation) (NLDAS_NOAH0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-02	2016-05-31	kg/m^2	-
<input type="checkbox"/>	Snowfall (frozen precipitation) (NLDAS_NOAH0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-02	2016-05-31	kg/m^2	-
<input type="checkbox"/>	Snow depth (NLDAS_NOAH0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-02	2016-05-31	m	-

Help

Reset

Feedback

Plot Data

Giovanni User Interface

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Maps

Time Averaged Map

Interactive map of average over time at each grid cell

[Details...](#)

Animation

Map animated along the chosen timeline for each grid cell

** Limited to 365 time steps*

[Details...](#)

Difference of Time Averaged

Difference of two time averaged variable maps

[Details...](#)

Accumulated

Accumulation of measurement over time at each grid point

[Details...](#)

User-Defined Climatology

Quasi Climatology Map

[Details...](#)

Comparisons

Map, Correlation

Simple linear regression of 2 variables at each grid cell

[Details...](#)

Scatter, Area Averaged (Static)

Scatter plot comparing area averaged time series for two variables

[Details...](#)

Scatter (Interactive)

Interactive Scatter

[Details...](#)

Scatter (Static)

Static Scatter

[Details...](#)

Scatter, Time-Averaged (Interactive)

Time-averaged, interactive X-Y plot of 2 variables

[Details...](#)

Time Series

Area-Averaged Differences

Time series of area averages of differences between two variables at each spatial grid point

[Details...](#)

Area-Averaged

Time series of area-averaged values

[Details...](#)

Seasonal

Seasonal (inter annual) time series

[Details...](#)

Hovmoller, Longitude-Averaged

Longitude-averaged Hovmoller, plotted over the selected time and latitude ranges

[Details...](#)

Hovmoller, Latitude-Averaged

Latitude-averaged Hovmoller, plotted over the selected time and longitude ranges

[Details...](#)

Vertical

Cross Map, Latitude-Pressure

Cross Map, Latitude-Pressure

[Details...](#)

Cross Map, Longitude-Pressure

Cross Map, Longitude-Pressure

[Details...](#)

Cross Map, Time-Pressure

Cross Map, Time-Pressure

[Details...](#)

Vertical Profile

Vertical Profile

[Details...](#)

Miscellaneous

Zonal Mean

Zonal mean plot, averaged values are plotted over latitude zones

[Details...](#)

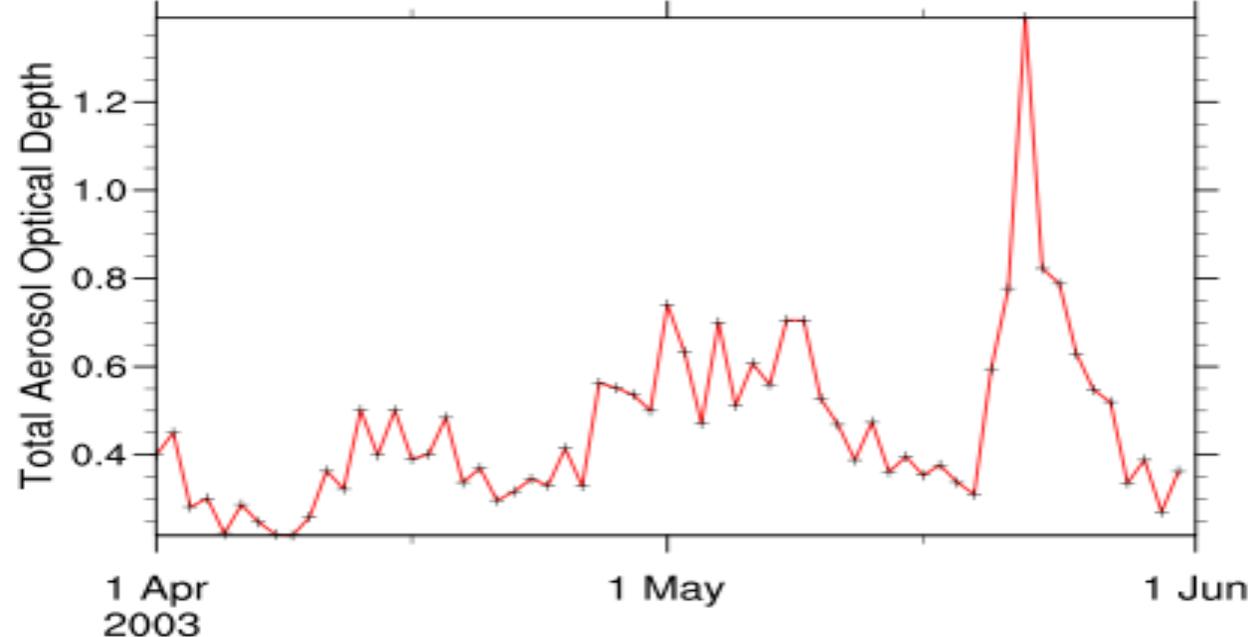
Histogram

Distribution of values over time and space

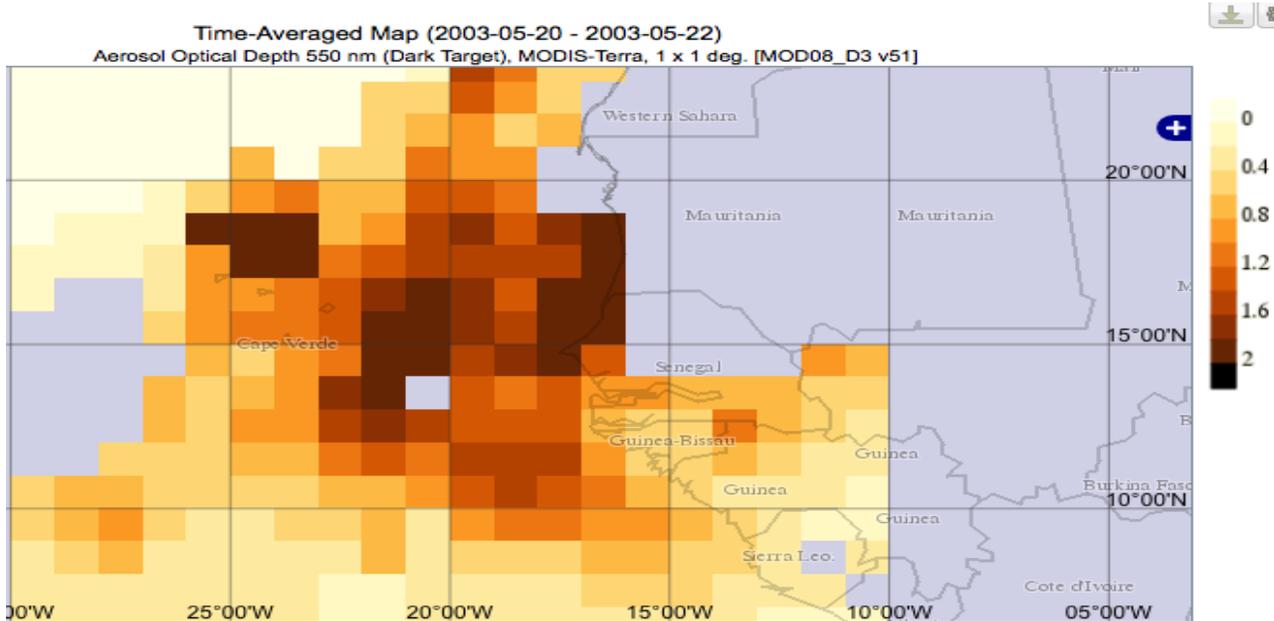
[Details...](#)

Example: Exploring in Time and Space

MOD08_D3 v51 Area-Averaged Time Series
2003-04-01 - 2003-05-31, Region 30W, 5N, 10W, 25N



Time Averaged Map 20-22 May



Area Averaged Map over Hydrology Basin

GIOVANNI

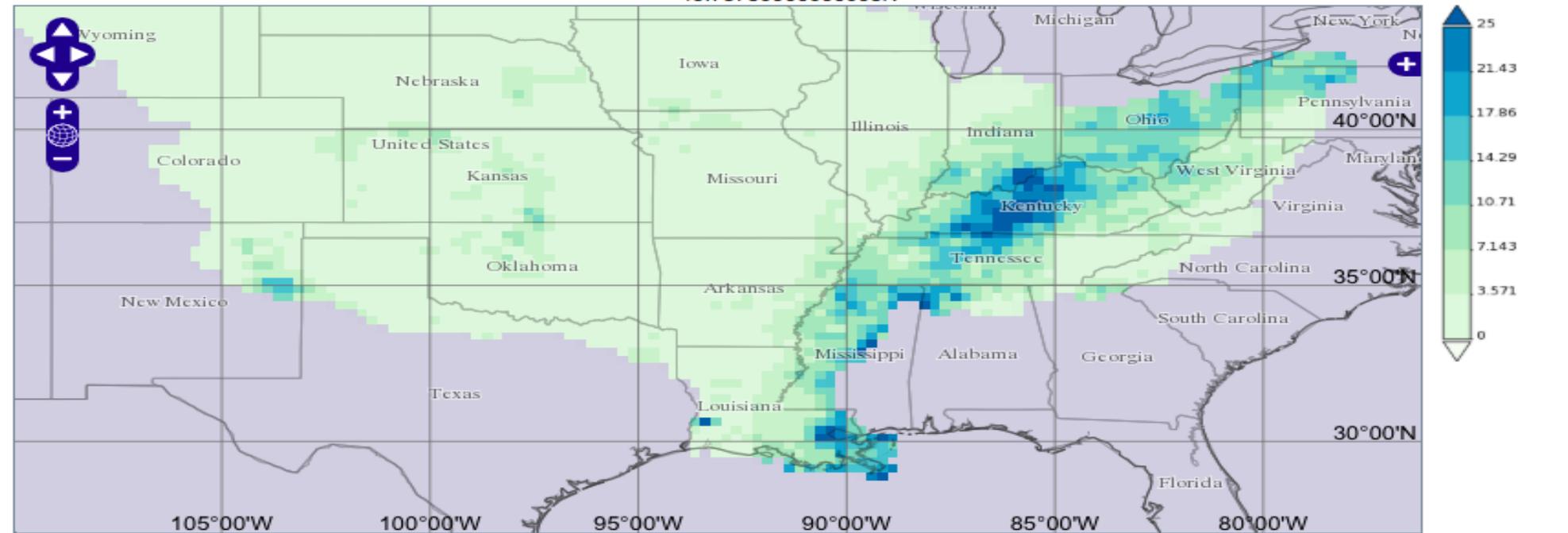
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- Browse History
 - 2. Time Averaged Map
 - User Input
 - Plots
 - Lineage
 - Downloads
 - 1. Time Averaged Map
 - User Input
 - Plots
 - Lineage
 - Downloads

Download As... Options

Time Averaged Map of Precipitation Rate daily 0.25 deg. [TRMM TRMM_3B42_daily v7] mm/day
over 2005-08-27 22:30Z - 2005-09-01 22:29Z, Shape Mississippi - Missouri, Region 113.93333333333328W, 28.925000000000068N, 49.73750000000008N



- Selected date range was 2005-08-28 - 2005-09-01. Title reflects the date range of the granules that went into making this result.

Katrina Rainfall over Mississippi - Missouri watershed

**Back to the Main
Attraction: Event Explorer**

Event Explorer Limitations

- Remember it is only a proof of concept Prototype and not an operational tool
- Phenomena Type
 - Hurricane
 - Volcanic Eruptions
 - Floods
 - Fires
- GSFC DAAC Data Holdings

UWG: Event Explorer Evaluation

- Is the concept of Event Explorer useful? (Rating 1-10)
- Will you use it in your research or classroom? If not, why not?
- Any other suggestions?
 - Additional Data (GHRC?)
 - Additional plotting features
 - Additional Phenomena types
- Other ideas or comments
- Detailed feedback for one selected event
 - Were the datasets and parameters correct?
 - Were the plotting options correct?

Event Explorer Tutorial

Hurricane Daniel

http://ec2-54-152-94-124.compute-1.amazonaws.com/case2/#/dark/EONET_1809

Cyclone Jasmine

http://ec2-54-152-94-124.compute-1.amazonaws.com/case2/#/dark/EONET_1322

Flooding in Houston

http://ec2-54-152-94-124.compute-1.amazonaws.com/case2/#/dark/EONET_368

Dust Storm over Red Sea

http://ec2-54-152-94-124.compute-1.amazonaws.com/case2/#/dark/EONET_237

Fire in Black Canyon, Washington

http://ec2-54-152-94-124.compute-1.amazonaws.com/case2/#/dark/EONET_125

Calbuco Volcano, Chile

http://ec2-54-152-94-124.compute-1.amazonaws.com/case2/#/dark/EONET_18

Evaluation Process

- Evaluation forms are built in the examples
 - "Turn Evaluation On"
- Additional Evaluation for the Rules
 - https://docs.google.com/spreadsheets/d/1fZCtJRFz3ni5b1lrKDA-GhaPy4KQjzU3CxBRn6QRtl_o/edit#gid=1896310359
 - Link given in the agenda