

**NASA Goddard Earth Sciences  
Data and Information Services Center  
(GES DISC)**

**NASA GES DISC's customized  
services for climatology and  
meteorology**

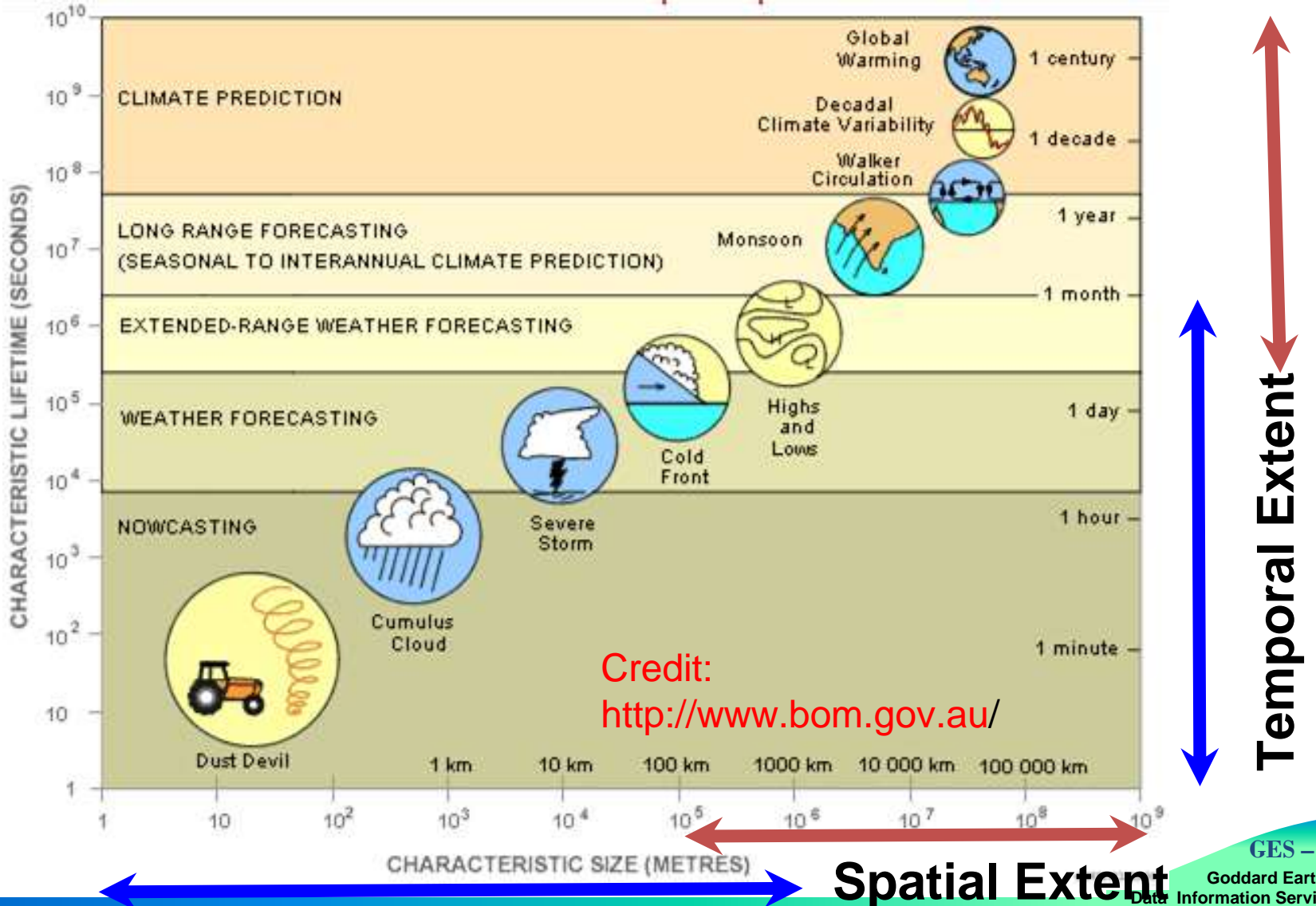
**Jennifer Wei, Suhung Shen, Jian Zeng, Dana Ostrenga, Bruce Vollmer, Angela Li,  
Long Pham and Dave Meyer**



# Outline

- Definition of Weather & Climate
- Fitness for business services for weather & climate
- NASA GES DISC Data & Services for Weather & Climate
- GES DISC user-friendly (but customizable) services

**Climate** is what you expect and **weather** is what you get!





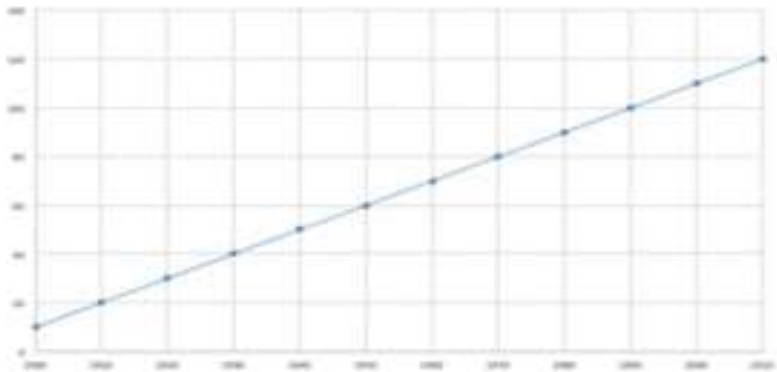
# Fitness for Business in Weather/Climate services - GES DISC Mission

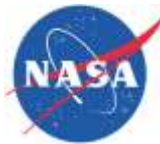
Will we  
need to  
evacuate  
the city due  
to ...?

How much  
solar/wind  
energy can  
we expect to  
get in this  
area?

Where...?  
What... ?  
How... ?

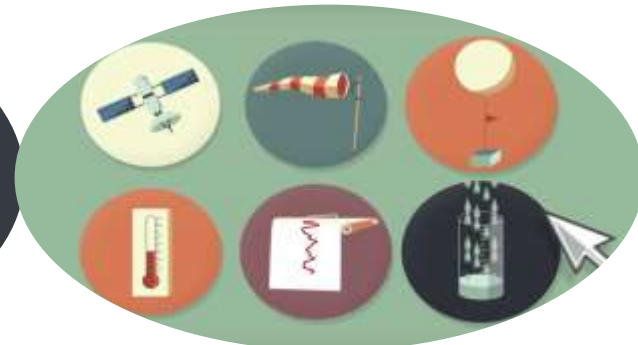
Weather vs. Climate





## Data Producers

## Data Users



### Sciences

Atmospheric  
Composition

Global Water &  
Energy Cycles

Climate  
Variability

Weather

Carbon Cycles

### Data

Satellite  
*In Situ*  
Model  
Aircraft

Ingest

Archive

Preservation

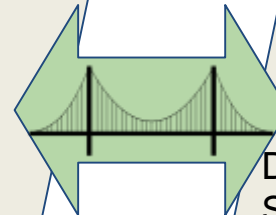
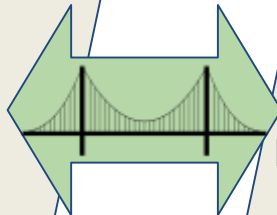
Distribution

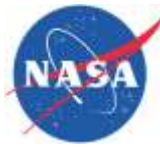
### Services

Accessibility  
Interoperability  
Usability

Downloading  
Subsetting  
Reprojection  
Visualization

User Services





# GES DISC Data Search Service: Explore Weather/Climate data



<https://disc.gsfc.nasa.gov>

The screenshot shows the GES DISC website interface. At the top, there's a navigation bar with 'Feedback', 'Help', and 'Login' links. Below that, the main header reads 'GES DISC Atmospheric Composition, Water & Energy Cycles and Climate Variability'. A left sidebar contains an 'Explore...' menu with options like 'Data Collections', 'Data Documentation', 'Alerts', 'FAQs', 'Glossary', 'How-To's', 'Image Gallery', 'News', and 'Tools'. The main content area features a search bar with the placeholder text 'Enter search (e.g., rainfall, GPM, TRMM\_3B42)'. Below the search bar is a 'Browse Data by Category' section with a dropdown menu currently showing 'Measurement'. A table of categories is visible, including 'Subject', 'Measurement', 'Source', 'Processing Level', 'Project', 'Temporal Resolution', and 'Spatial Resolution'. A green callout box on the right provides an example: 'Example: SO2 data associated to Volcano, Mount Merapi, Indonesia (Nov 6-12, 2010)'. Red boxes and arrows highlight the 'Explore...' menu, the search bar, and the 'Measurement' category dropdown.

**Keyword Search**

**Temporal and spatial Range**

**Example:**  
**SO2 data**  
**associated to Volcano,**  
**Mount Merapi, Indonesia**  
**(Nov 6-12, 2010).**

**Navigating Data**

**Feedback Help Login**

**Explore...**

**Explore...**

**Browse Data by Category**

Subject	Measurement	Runoff
24 Hour Precipitation Amount	Flight Data Logs	
Absorption	Floods	
Aerosol Backscatter	Geolocation	
Aerosol Extinction	Geopotential Height	
Aerosol Optical Depth/Thickness	Glaciers	
Aerosol Particle Properties	Ground Ice	
Aerosol Radiance	Heat Flux	
Air Temperature	Humidity	
Albedo	Humidity Index	
Alkalinity	Hurricanes	
Angstrom Exponent	Hydrogen Chloride	
Antenna Temperature	Hydrogen Cyanide	
Atmospheric Emitted Radiation	Hydrogen Fluoride	
Atmospheric Heating	Hydroperoxy	
Atmospheric Pressure	Hydroxyl	
Measurements	Hypochlorous Acid	
	Ice Fraction	
	Snow Depth	
	Snow Melt	
	Snow Water Equivalent	
	Soil Heat Budget	
	Soil Moisture/Water Content	

Archive Size: 2,207 798 TB  
Archived Data Files: 115,845,589  
Files Distributed\*: 2,362,370,288  
Data Volume Distributed\*: 22,462.951 TB

Projects & Missions



# Giovanni - Analyze/Visualize on-the-fly service

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

**GIOVANNI** This Bridge Between Data and Science # 4.28

3872 Project recommendations not to use 3881 coranin.CO and 274... 11 of 1 message(s) Read More

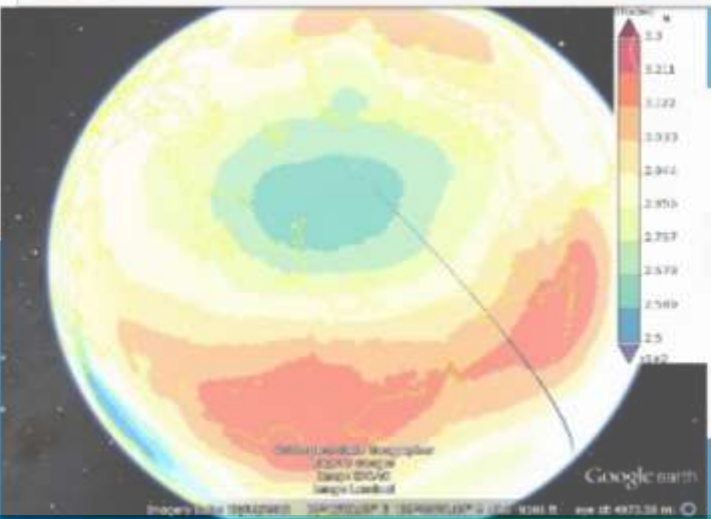
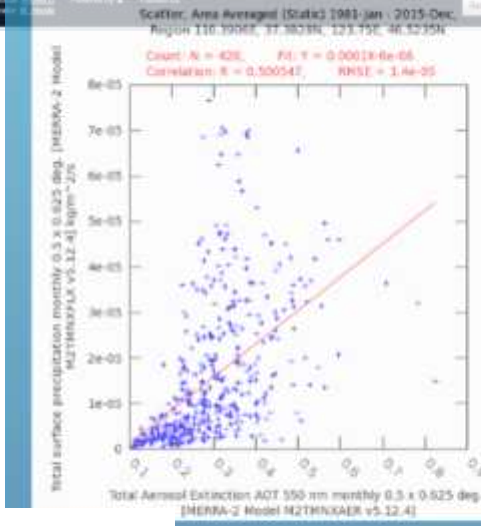
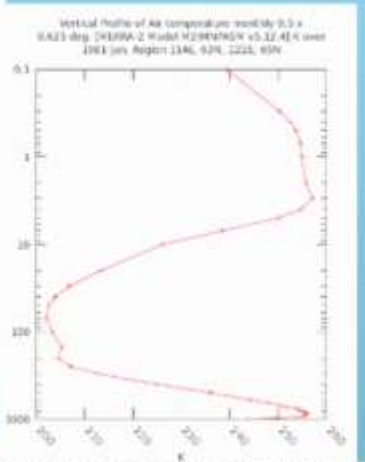
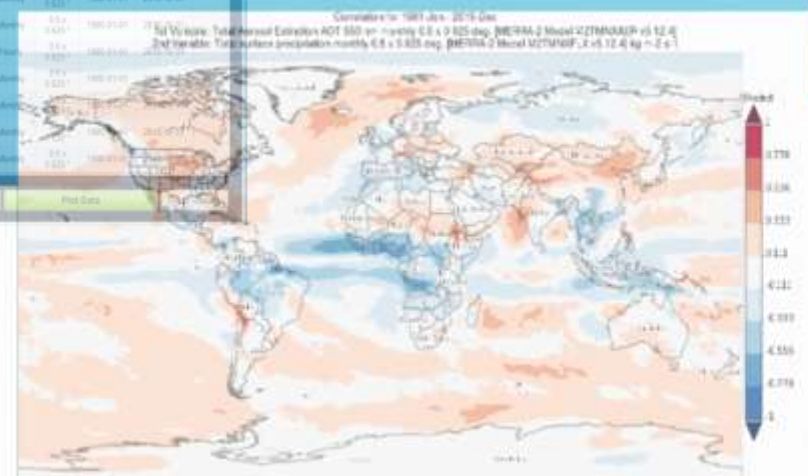
Select Plot  
 + Map, Time-Averaged Map, Comparison, Select, Vertical Select, Time Series, Select, Multi-Frame, Select

Select Date Range (UTC)  
 2019-01-04 00:00:00 to 2019-01-19 00:00:00 48.33.548.18

Select Region (Bounding Box or Shape)  
 190.0, 20.0, 10.0, 10.0

Select Variables  
 Measurements  
 303 Carbon Dioxide (Ozone) Layers (MCO2) 303 (1958-01-01)

Variable	Units	Source	Temp. Res.	Spac. Res.	Begin Date	End Date
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Daily	4.25°	1958-01-01	2018-11-21
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Monthly	2.5°	1958-01-01	2018-11-21
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Monthly	2.5°	1958-01-01	2018-11-21
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Monthly	2.5°	1958-01-01	2018-11-21
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Monthly	2.5°	1958-01-01	2018-11-21
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Monthly	2.5°	1958-01-01	2018-11-21
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Monthly	2.5°	1958-01-01	2018-11-21
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Monthly	2.5°	1958-01-01	2018-11-21
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Monthly	2.5°	1958-01-01	2018-11-21
303 Carbon Dioxide (Ozone) Layers (MCO2)	ppm	TMG	Monthly	2.5°	1958-01-01	2018-11-21





# Analyze California Fire with GES DISC data & tools



## Carbon Monoxide and Aerosol from Satellites and MERRA-2 California Fire, July 28 2018

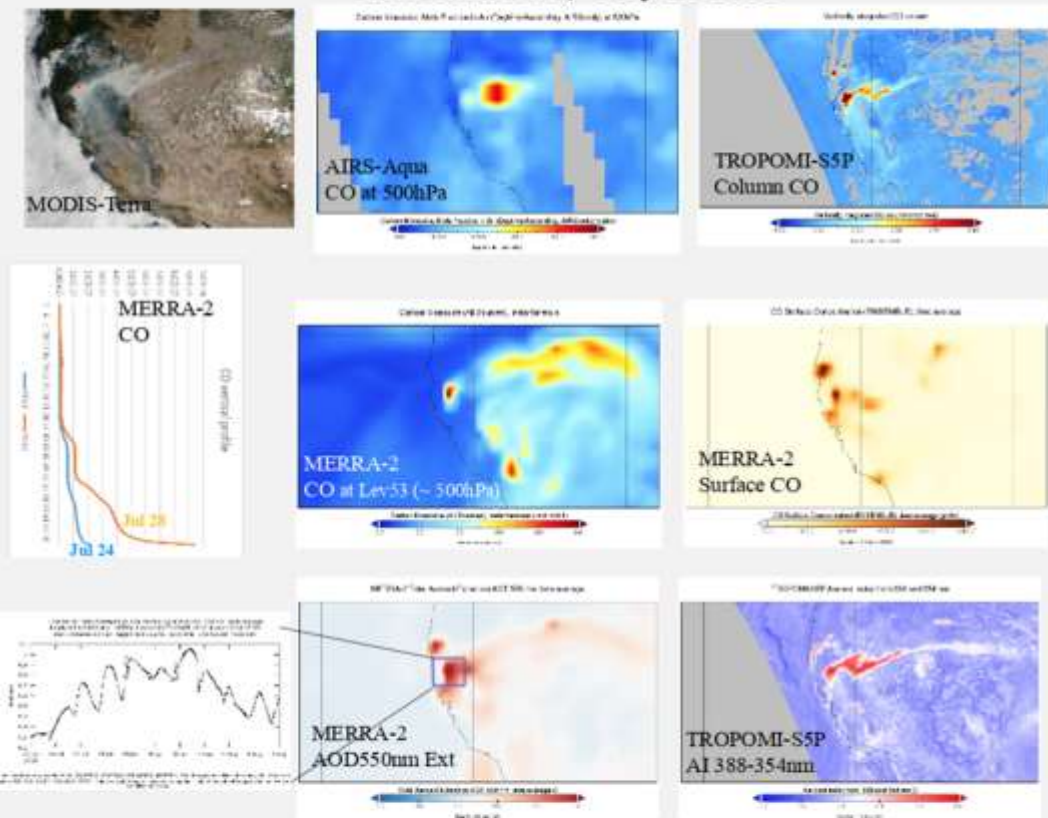


Fig.1 Images demonstrated the large scale elevated Carbon Monoxide (CO) and aerosols observed from satellite (AIRS/Aqua and TROPOMI/Sentinel-5P) and model assimilated data from MERRA-2 during a California Fire event on July 28 2018. The true color image is from MODIS-Terra.

## Meteorology and Land Surface Conditions Before the Fire event

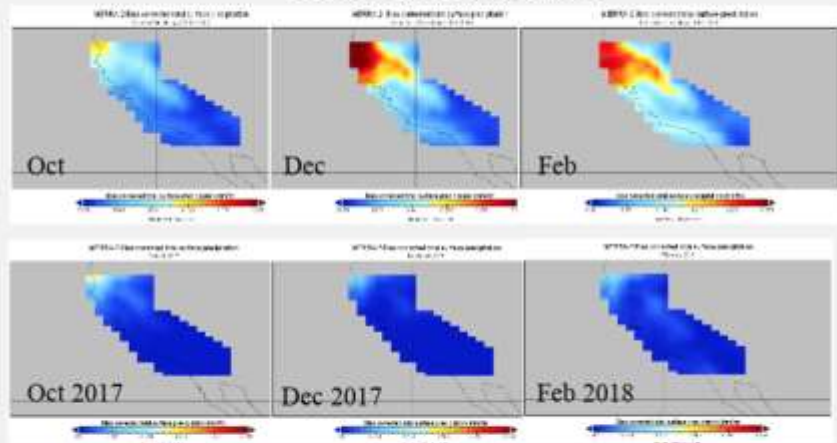


Fig.2 Images are monthly precipitation from MERRA-2, showing that the precipitation during 2017-2018 raining season is much below the climatology.

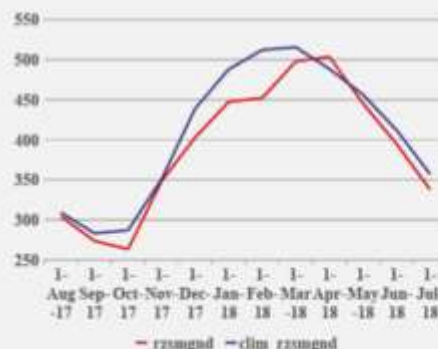


Fig.3 Time series of monthly soil moisture at root zone from NLDAS\_NOAH over northern California (-124.0,38.9,-120.3,41.5) from Aug 2017 to Jul 2018 (Red line) and corresponding monthly Climatology



How-To's

Download

Case Study

Visualization

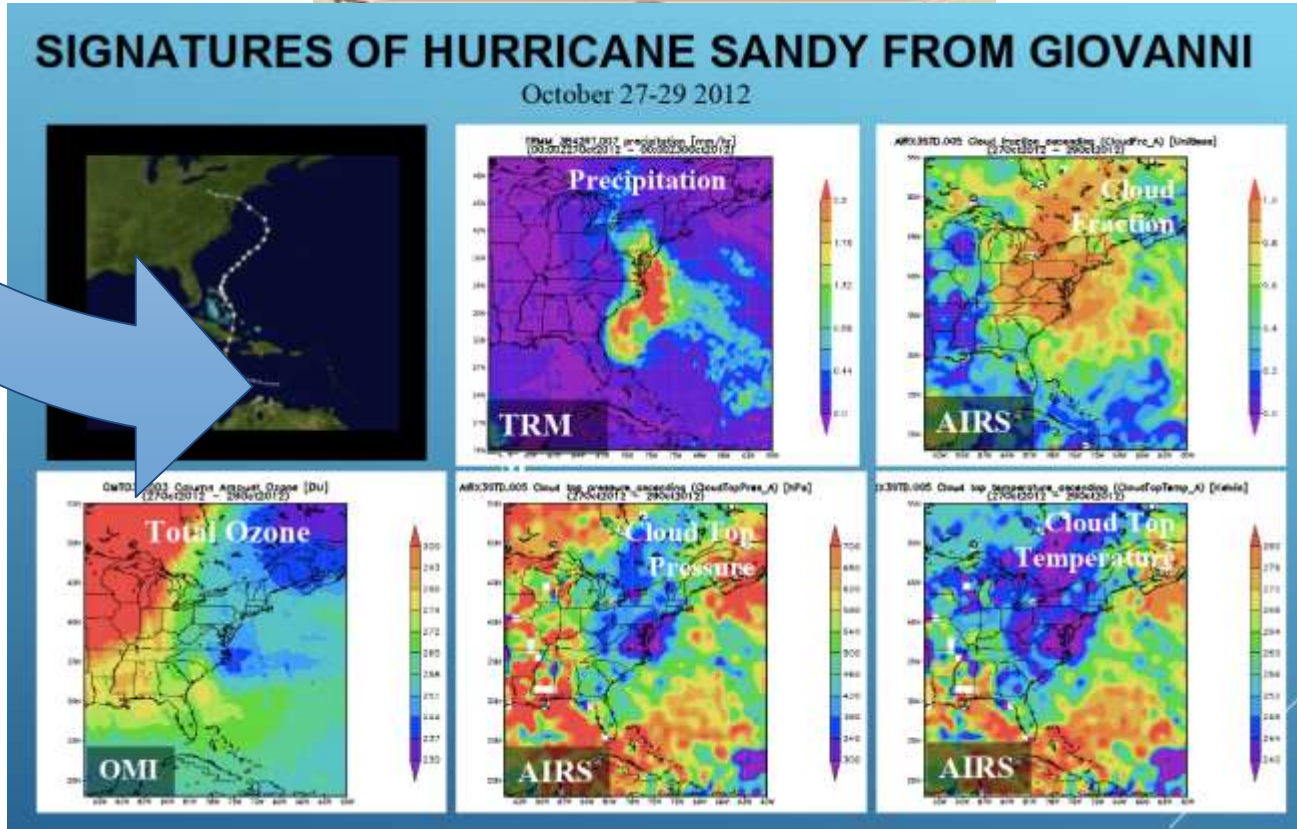




# GES DISC Customizable datasets for features




List of "Bundle Data Parameters"		
<b>Hurricane</b>	<b>Volcano</b>	<b>Flood</b>
Precipitation; Wind Speed; SST; Humidity; Air Temp.; Sfc Pressure; Aerosol	Air Temp.; SO2; Aerosol/Dust; Wind Speed; Humidity; Clouds	Precipitation; Soil Moisture; Sfc Runoff; Humidity; Air Temp.






# Customized with GES DISC data & tools

- Videos on **You Tube** : subscribe “NASAGESDISC”
- Twitter  : @NASA\_GESDISC, @NASA\_Giovanni
- How-To's

Download

Case Study

Visualization

- Feedback: 
- Help Desk: [gsfc-help-disc@lists.nasa.gov](mailto:gsfc-help-disc@lists.nasa.gov)
- **Data Recipe or Data HowTo's**
- Webinars
- **GES DISC news articles**

