



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

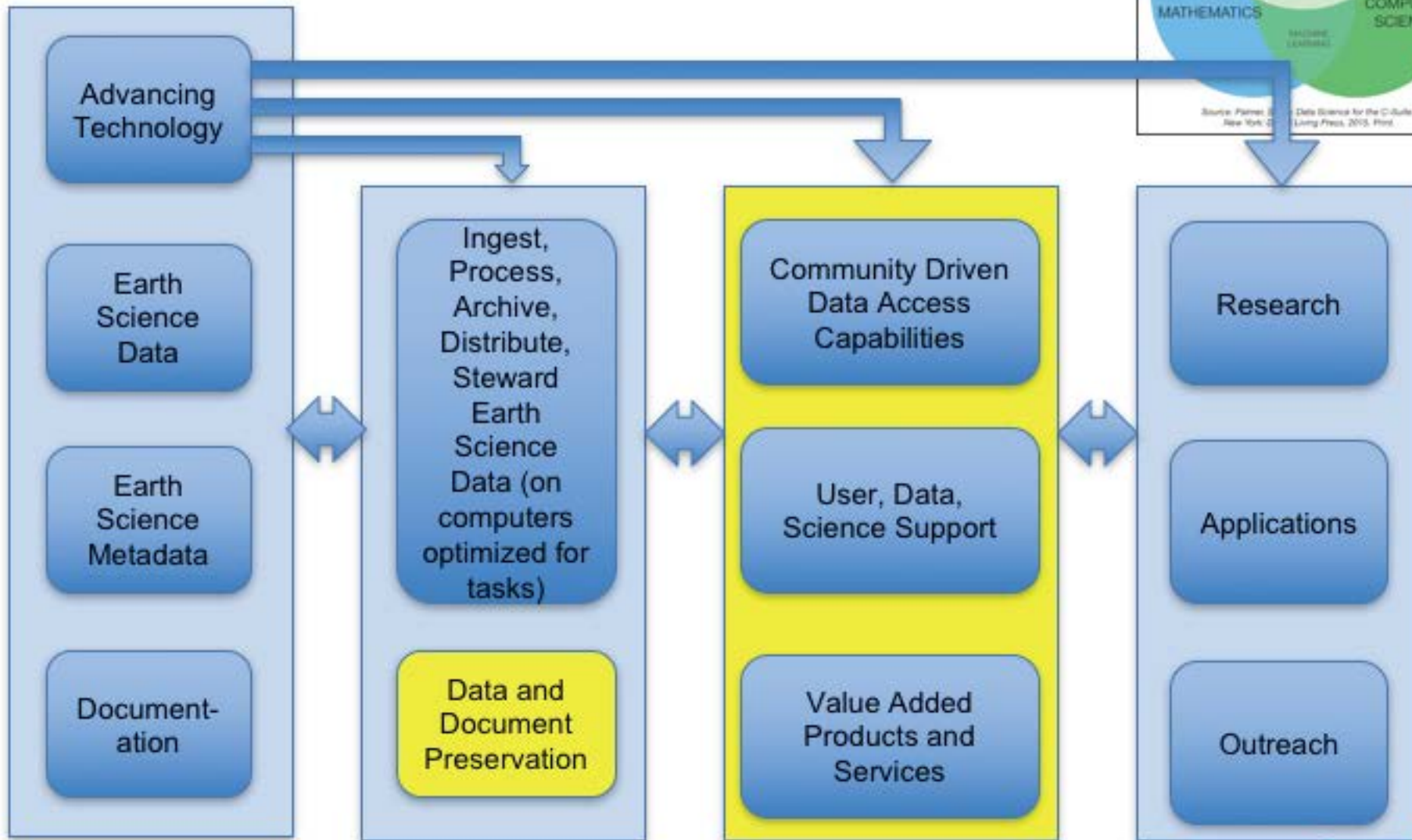
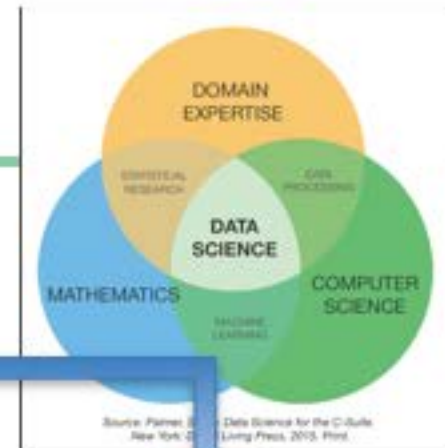
*NASA GES DISC **NEW** data service and data  
management for the Air Quality community*

**Jennifer Wei  
NASA GES DISC/Adnet System Inc.**

**HAQAST2**



# The *NEW* GES DISC World



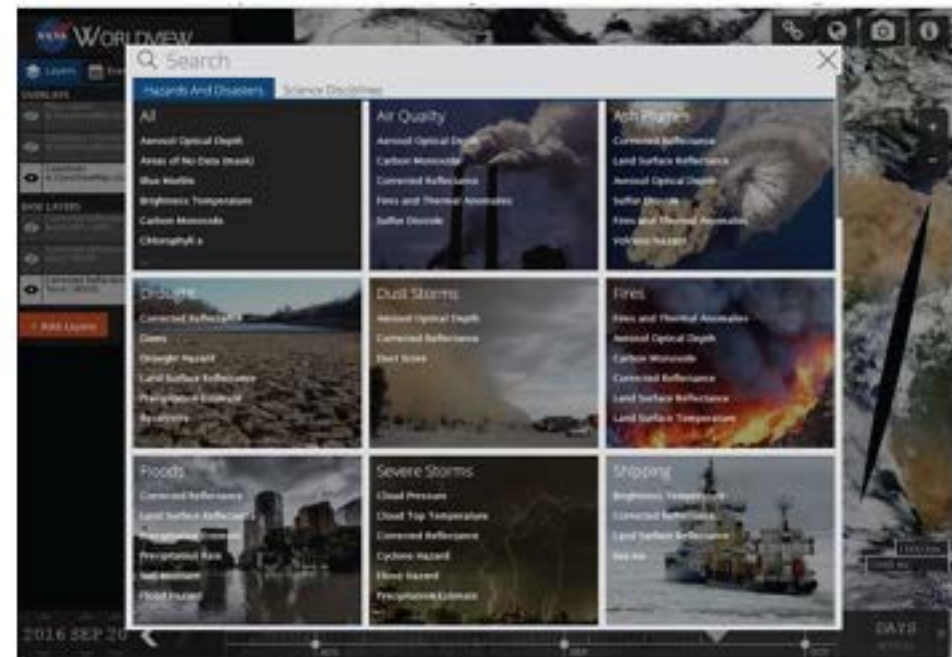


## Big Earth Data Initiative (BEDI) set up Data Management standards

**Origin:** President Obama's "Big Data Research and Development Initiative" seeks to improve our ability to acquire knowledge and discover insights into large and complex collections of digital data.

**Outcome:** The Big Earth Data Initiative (BEDI) invests in standardizing and optimizing the collection, management and delivery of U.S. Government's civil Earth observation data.

- **Discover:** improve metadata in archives to make datasets more discoverable by popular search engines (e.g., Google or Bing)
- **Access:** Develop better web accessible APIs by improving geospatial coordinate handling and response formats
- **Use:** enhance data usability is the organization of data collections into 12 Societal Benefit Areas, or SBA.



Source: <https://earthdata.nasa.gov/eosdis-role-in-bedi> DIS - DISC  
Goddard Earth Sciences  
Data Information Services Center



# Easy to Discover – GES DISC Way

**GES DISC**  
Atmospheric Composition, Water & Energy Cycles and Climate Variability

Feedback Help Login

Explore...

Data Collections Related Documentation

Enter search (e.g., rainfall, GPM, TRMM\_3B42)

Browse Data by Category -

What else can you find here?

**Projects & Missions**

**GPM**  
Global Precipitation Measurement (GPM) is an international satellite mission to provide next-generation observations of rain and snow worldw...

**TRMM**  
The Tropical Rainfall Measuring Mission (TRMM) is a joint mission between NASA and the Japan Aerospace Exploration (JAXA) Agency to study ra...

[More Projects & Missions ...](#)

**Related Images**

mode fraction of carbon-dioxide in the troposphere

**News**

**NASA GES DISC at the 2016 AGU Fall Meeting**  
Dec 12, 2016

**NCA-LDAS Noah data product released by NASA GES DISC**  
Dec 8, 2016

**The Giovanni News, December 2016 Special AGU Issue, is online**  
Dec 7, 2016

History

<https://disc-beta.gsfc.nasa.gov/uui/>



# Easy to Discover – ESDIS Way

EARTHDATA Search

Feedback Earthdata Login

## Discover Earth Science Data

Search NASA Earth Science data by keyword and filter by **time** or **space**.

Type any topic or collection name **Temporal** **Spatial**

**Browse All Data** Use categories to narrow your results.

Welcome to Earthdata Search

Enter your search terms or click **Next** to take an introductory tour.

End Tour Next

<https://search.earthdata.nasa.gov>



# Increase Access

GES DISC

OMNO2d\_003

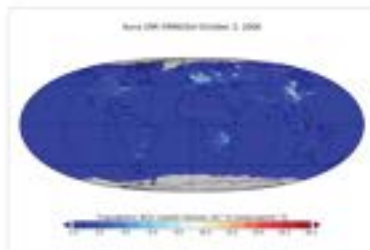


Feedback Help ▾

Atmospheric Composition , Water and Energy Cycle , and Climate Variability Data

◀ Go to Search Results

## OMNO2d: OMI/Aura NO2 Cloud-Screened Total and Tropospheric Column L3 Global Gridded 0.25 degree x 0.25 degree V3



This is Level-3 daily global gridded (0.25x0.25 deg) Nitrogen Dioxide Product (OMNO2d). OMNO2d data product is a Level-3 Gridded Product where pixel level data of good quality are binned and "averaged" into 0.25x0.25 degree global grids. This product contains Total column NO2 and Total Tropospheric Column NO2, for all atmospheric conditions, and for sky conditions where cloud fraction is less than 30 percent. Nitrogen dioxide is an important chemical species in both, the stratosphere where it plays a key role in ozone chemistry, and in the troposphere where it is a precursor to ozone

production. In the troposphere, it is produced in various combustion processes and in lightning and is an indicator of poor air quality. OMNO2d data are stored in EOS Hierarchical Data Format (HDF-EOS). Each file contains data from the day lit portion [More ...](#)

Product Summary

[Data Citation](#)

[Documentation](#)

### Data Access

[Online Archive](#)

[Search ▾](#)

[Simple Subset Wizard](#)

[Web Services ▾](#)

OPENDAP DATA

[Web Map Service \(WMS\)](#)

[Web Coverage Service \(WCS\)](#)

[Web Coverage Service \(WCS\)](#)

Shortname: OMNO2d

Longname: OMI/Aura NO2 Cloud-Screened Total and Tropospheric Column L3 Global Gridded 0.25



# Improve Usability – User Needs Based Data Usage Metrics

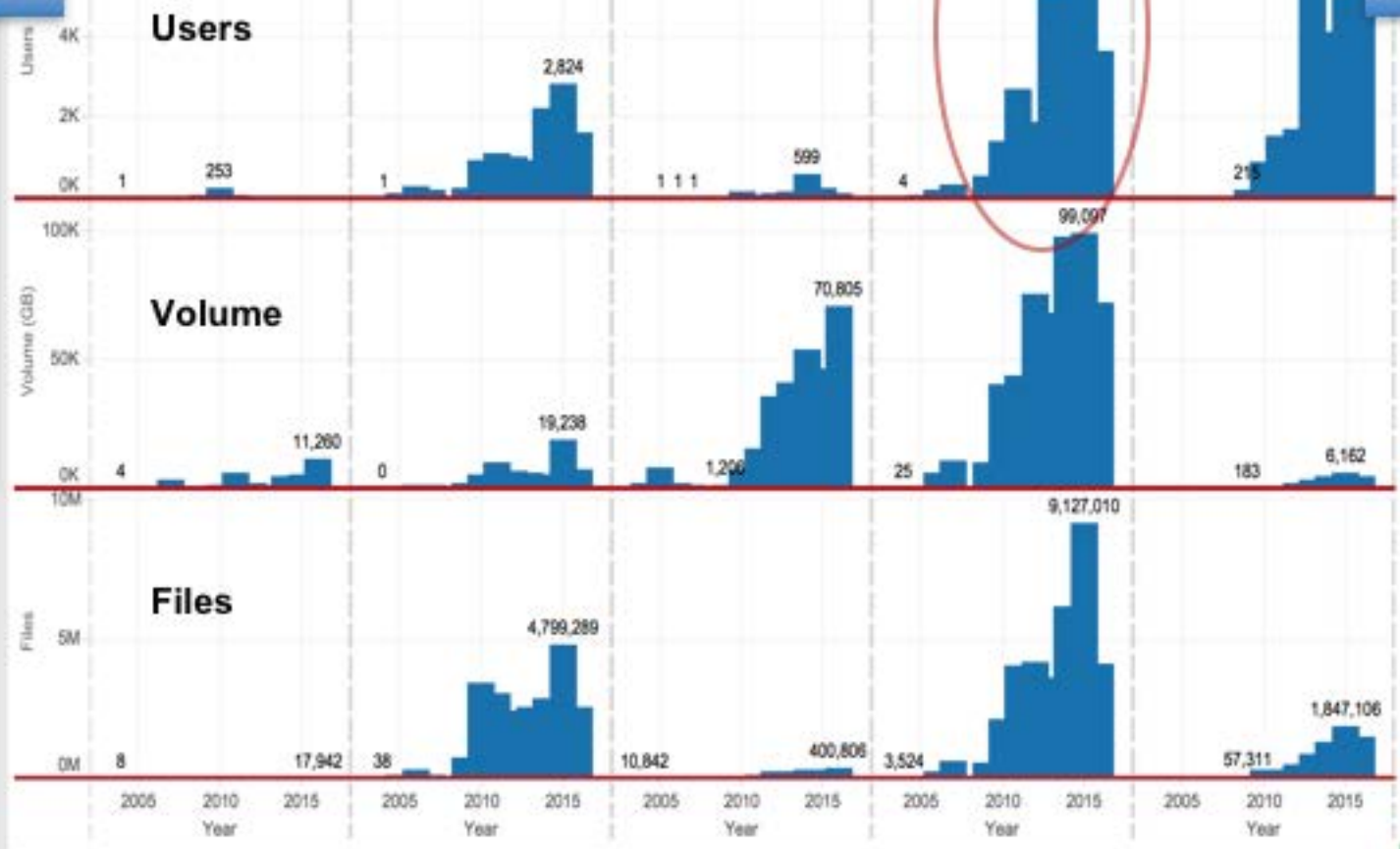


## Metrics: MLS/OMI Data Distribution

Product Level  
MLS\_L1    MLS\_L2    OMI\_L1    OMI\_L2    OMI\_L3

MLS

OMI





# Improve Usability – User Needs Based Help Desk Requests Metrics/Google Scholar Metrics

## ❑ User Complaints

**Q:** Fail to Find/Access/Download Data, data formats

**Cause:** broken URL links, deprecating old tools, workflow failure, HDF4/5 (why not ascii)

## ❑ Application

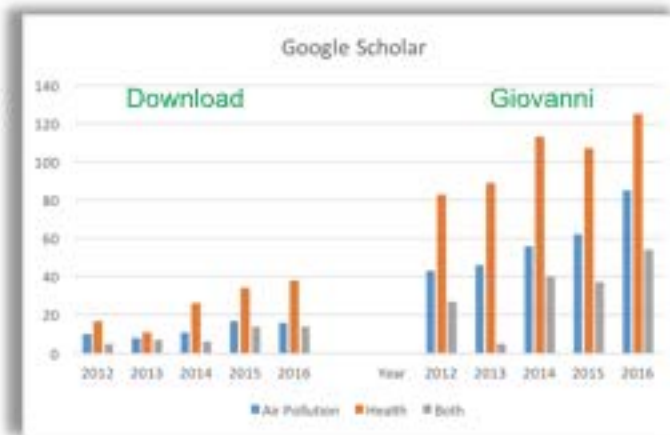
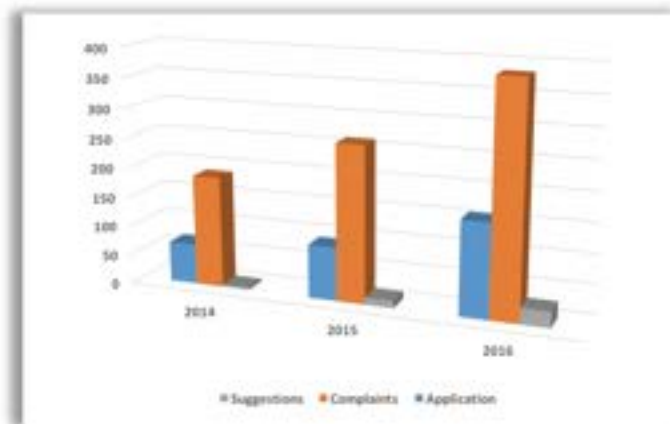
**Q:** Data Inquiry, Service Inquiry

**Cause:** Diff. temporal/spatial data inquired, interoperability other tools (Matlab/IDL/Python, WCS/WMS, R/ArcGIS...)

## ❑ Suggestion

**Q:** Subsetting/visualization service, data transformation

**Cause:** Software not compatible, non-conventional users







# Improve Usability – User Needs Based Satellite Level 2 Services - MAPSS

The Multi-sensor Aerosol Products Sampling System (MAPSS) has been established as a consensus data framework for multi-sensor aerosol validation, intercomparison, and joint analysis. MAPSS provides statistics of spatial and temporal subsets of Level-2 aerosol scientific data sets (SDS) from a range of sensors that currently includes AERONET, MODIS, MISR, OMI, SWDB, VIIRS, POLDER, and CALIOP.

## MAPSS

### MAPSS: Multi-sensor Aerosol Products Sampling System

This user interface is used to obtain selected parameter statistics from the MAPSS database for a chosen location and time period. Time Series Plot is the available service. Plot output is rendered as a graph and is also available in ASCII format.

The screenshot shows the MAPSS web interface with the following sections:

- Data Selection**: Includes a 'NEW Try out the MAPSS Statistical Explorer' button.
- Plot Data**: A green button with 'Reset', 'Clear', 'Send Us Feedback', and 'Help' options.
- Select Station**: A text input field with a 'Browse' button.
- Select Plot**: Radio buttons for 'Time Series' (selected) and 'Scatter Plot'.
- Select Measurements**: A section with 'Basic' and 'Advanced' tabs. It contains a table for selecting parameters, layers, and measurements.

Product	Parameter	Layer	Measurement
AERONET aerosols L2, ver. 2			
AERONET deconvolution L2, ver. 4f			
AERONET inversions L1a, ver. 2			
AERONET inversions L2, ver. 2			
CALIPSO column and layer aerosols L2			
More...			

## MAPSS Explorer

The screenshot shows the MAPSS Explorer web interface with the following features:

- Interactive Map**: A map of Washington, D.C. area with a circular data visualization overlay. The visualization is a pie chart with segments labeled with values like 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.10, 0.11, 0.12, 0.13, 0.14, 0.15, 0.16, 0.17, 0.18, 0.19, 0.20, 0.21, 0.22, 0.23, 0.24, 0.25, 0.26, 0.27, 0.28, 0.29, 0.30, 0.31, 0.32, 0.33, 0.34, 0.35, 0.36, 0.37, 0.38, 0.39, 0.40, 0.41, 0.42, 0.43, 0.44, 0.45, 0.46, 0.47, 0.48, 0.49, 0.50, 0.51, 0.52, 0.53, 0.54, 0.55, 0.56, 0.57, 0.58, 0.59, 0.60, 0.61, 0.62, 0.63, 0.64, 0.65, 0.66, 0.67, 0.68, 0.69, 0.70, 0.71, 0.72, 0.73, 0.74, 0.75, 0.76, 0.77, 0.78, 0.79, 0.80, 0.81, 0.82, 0.83, 0.84, 0.85, 0.86, 0.87, 0.88, 0.89, 0.90, 0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99, 1.00.
- Key to map symbols**: A legend for map symbols including sensor types (MODIS, OMI, CALIOP, MISR, POLDER, SwRFS, ND DATA) and statistics values (normalized) and sample sizes (N < 10, 10 <= N < 100, N >= 100).

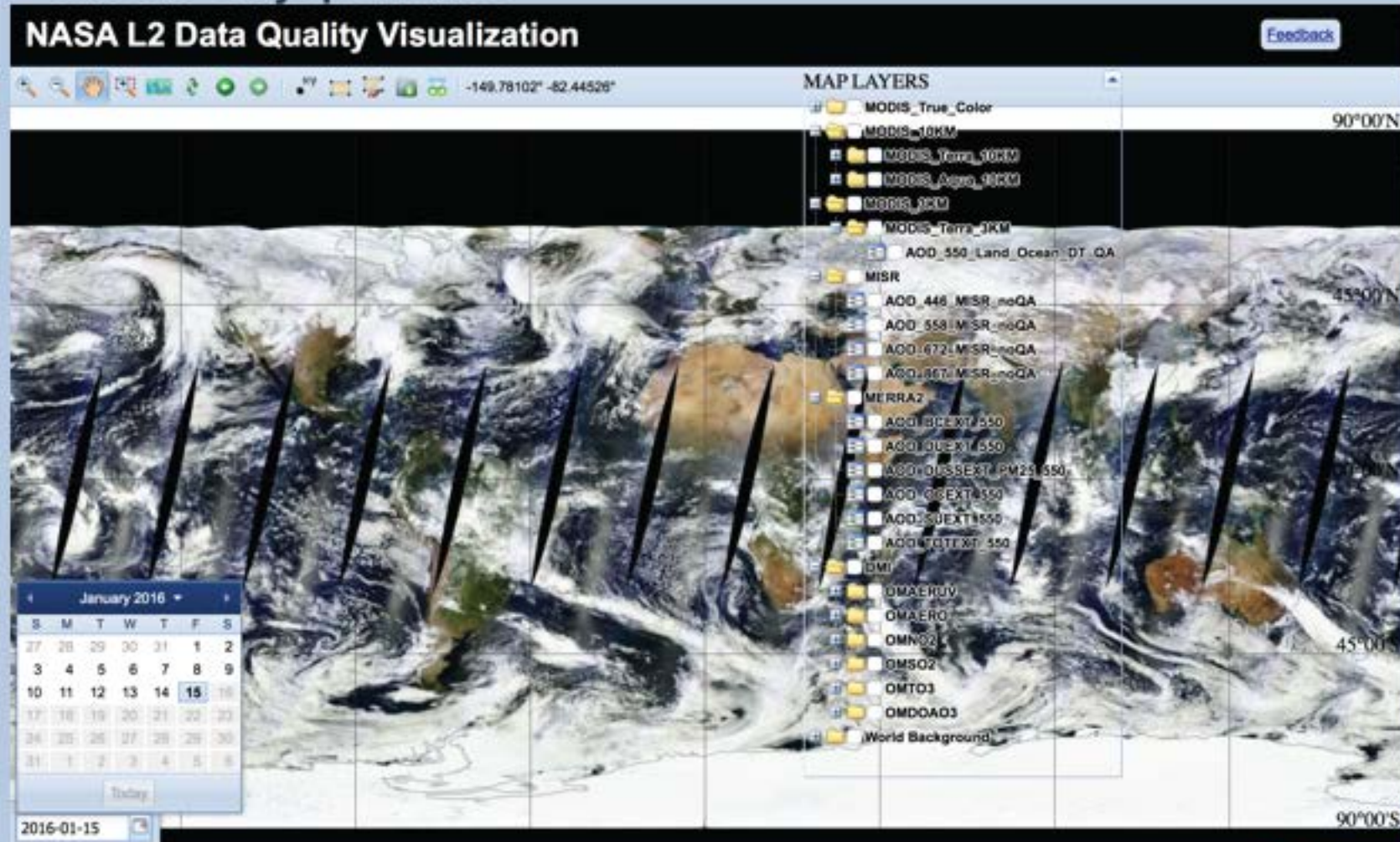
<https://giovanni.sci.gsfc.nasa.gov/mapss/>

[https://giovanni.gsfc.nasa.gov/mapss\\_explorer/](https://giovanni.gsfc.nasa.gov/mapss_explorer/)



## Improve Usability – User Needs Based Satellite Level 2 + Model Services - DQViz

- Use visual to demonstrate satellite Level 2 physical quantity
- Use visual to differentiate observations made by different platforms
- Caveat: Only qualitative



[https://disc1.gesdisc.eosdis.nasa.gov/dqviz/l2portal\\_transparent/index.htm](https://disc1.gesdisc.eosdis.nasa.gov/dqviz/l2portal_transparent/index.htm)



## Improve Usability – User Needs Based Knowledge advances by Citizen Science



<https://trends.google.com/trends/explore?cat=45&date=2007-02-24%202017-02-24&q=air%20quality>

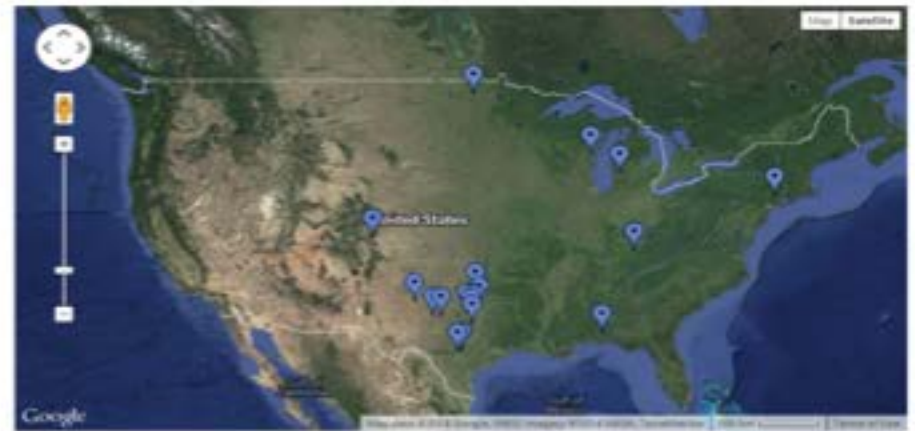
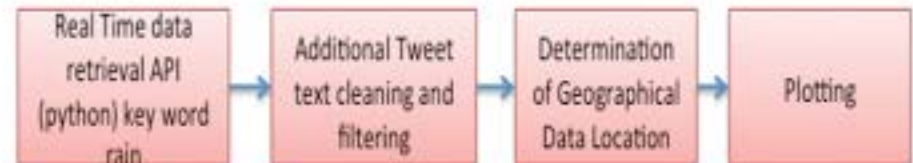
- Internet is enriched with information
- Recognize citizen scientists are both data producers and users
- Federal Crowdsourcing and Citizen Science Catalog
  - <https://citizenscience.gov>
  - <https://ccsinventory.wilsoncenter.org>
- GES DISC's perspective: How can we better utilize crowdsourcing apps to help the community?



# Using Twitter to Validate Satellite Obs.

**Objective:** Develop a general infrastructure for processing social media  
**Use Case:** Precipitation

- Listen to Twitter stream in real-time for “precipitation” and related tweets.
- Apply basic filters for exact phrases.
- Extract location information.
- Map resulting tweet distributions.



From Dr. William Teng (william.l.teng@nasa.gov)  
Data Mining Twitter for Augmenting NASA Precipitation Research and Applications,  
funded by NASA "Citizen Science for Earth Systems Program NNH16ZDA001N-CSESP



# How can we help?

[gsfc-help-disc@lists.nasa.gov](mailto:gsfc-help-disc@lists.nasa.gov)

[Jennifer.C.Wei@nasa.gov](mailto:Jennifer.C.Wei@nasa.gov)