



Giovanni – The Bridge Between Data & Science

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Disclaimer

- This presentation only provides steps to use GIOVANNI and screenshots may not represent actual outputs.



GIOVANNI - The Bridge Between Data and Science

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

The screenshot displays the GIOVANNI web interface. At the top, there is a navigation bar with 'EARTHDATA' and several dropdown menus: 'Data Discovery', 'DAACs', 'Community', and 'Science Disciplines'. Below this is the 'GIOVANNI' logo and the tagline 'The Bridge Between Data and Science v 4.24'. There are links for 'Release Notes', 'Browser Compatibility', 'Known Issues', and 'Earthdata Login'. A yellow banner indicates that 'Time series area statistics temporarily unavailable ... [1 of 1 messages] Read More'. The main content area is divided into several sections: 'Select Plot' with radio buttons for 'Maps: Time Averaged Map', 'Comparisons', 'Vertical', 'Time Series', and 'Miscellaneous'; 'Select Date Range (UTC)' with input fields for date and time, and a 'Valid Range: 1948-01-01 to 2018-02-18' note; 'Select Region (Bounding Box or Shape)' with a text input field and a 'Format: West, South, East, North' note; 'Select Variables' with a list of disciplines and measurements, a search bar, and a 'Total Variable(s) included in Plot: 0' indicator. At the bottom right, there are buttons for 'Help', 'Reset', 'Feedback', and a prominent green 'Plot Data' button.



Aerosol Data Analysis: Step 1

- Under **Select Plot**, set **Maps** to **Time Averaged Map**
- Select your date range
 - Set the range to **2018-10-15** to **2018-10-30**
- Select your region either by typing in coordinates or by clicking the button and drawing a box around your area of interest
 - For this exercise, use the coordinates: **(5N, 65E, 35N, 95E)** or draw a box that covers Indonesia and the surrounding region

The screenshot displays a web interface for data analysis. It is divided into three main sections:

- Select Plot:** This section contains four radio button options: "Maps: Time Averaged Map" (which is selected and highlighted in yellow), "Comparisons: Select...", "Vertical: Select...", and "Time Series: Select...".
- Select Date Range (UTC):** This section shows a date range selector. The current range is "2015 -09 -15 00 :00 to 2015 -09 -30 23 :59". Below this, it states "Valid Range: 1948-01-01 to 2018-02-18".
- Select Region (Bounding Box or Shape):** This section shows a text input field containing the coordinates "90.7031,-13.3594,146.9531,14.76E" and a button with a blue arrow pointing left.



Aerosol Data Analysis: Step 2

- Select **Variables**

- For this exercise, under Disciplines select **Aerosols**

- Then select Combined Dark Target and Deep Blue AOD at 0.55 micron for land and ocean: Mean (MOD08_D3_v6) - Daily

Select Variables

▼ **Disciplines**

- Aerosols (8)
- Atmospheric Chemistry (5)
- Atmospheric Dynamics (2)
- Ocean Biology (2)
- Oceanography (2)

▼ **Measurements**

- Aerosol Index (2)
- Aerosol Optical Depth (8)
- Angstrom Exponent (4)
- Scattering Angle (2)
- Total Aerosol Optical Depth (2)

▼ **Platform / Instrument**

- AMSR-E (4)
- MERRA-2 Model (19)
- MISR (2)
- MODIS-Aqua (8)
- MODIS-Terra (6)
- OMI (8)
- SeaWiFS (38)

Number of matching Variables: 8 of 1897 Total Variable(s) included in Plot: 1

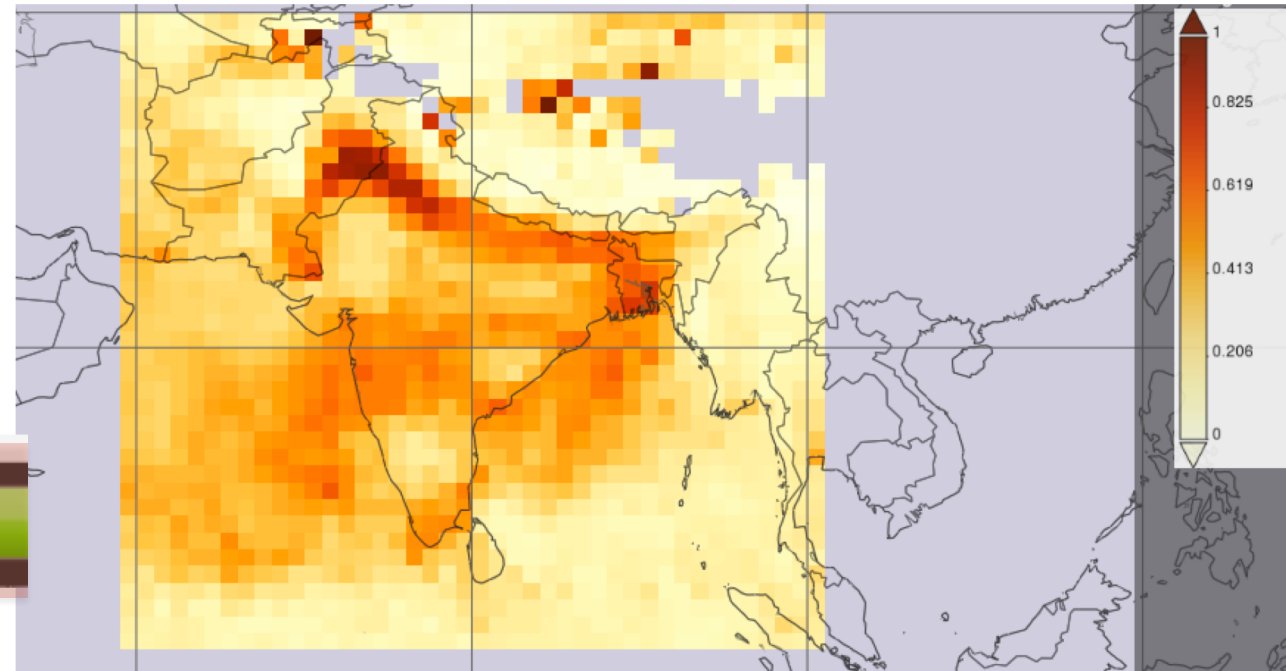
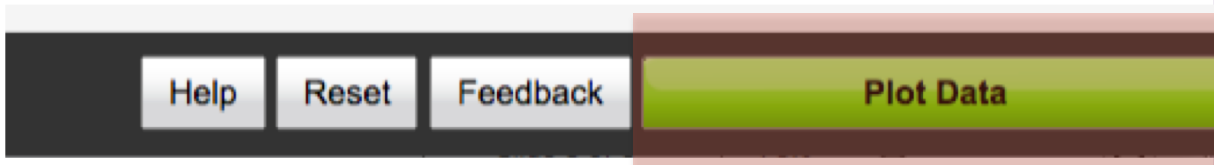
Keyword: Search Clear

	Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units
<input type="checkbox"/>	Aerosol Optical Thickness at 0.55 microns for both Ocean (best) and Land (corrected): Mean of Daily Mean (MYD08_M3_v6)	MODIS-Aqua	Monthly	1 °	2002-07-04	2018-01-31	-
<input type="checkbox"/>	Aerosol Optical Depth 550 nm (Deep Blue, Land-only) (MYD08_M3_v6)	MODIS-Aqua	Monthly	1 °	2002-07-04	2018-01-31	-
<input type="checkbox"/>	Aerosol Optical Depth 550 nm (Dark Target) (MYD08_D3_v6)	MODIS-Aqua	Daily	1 °	2002-07-04	2018-02-13	-
<input checked="" type="checkbox"/>	Combined Dark Target and Deep Blue AOD at 0.55 micron for land and ocean: Mean (MYD08_D3_v6)	MODIS-Aqua	Daily	1 °	2002-07-04	2018-02-13	-
<input type="checkbox"/>	Aerosol Optical Depth 550 nm (Deep Blue, Land-only) (MYD08_D3_v6)	MODIS-Aqua	Daily	1 °	2002-07-04	2018-02-13	-
<input type="checkbox"/>	Combined Dark Target and Deep Blue AOD at 0.55 micron for land and ocean: Mean of Daily Mean (MYD08_M3_v6)	MODIS-Aqua	Monthly	1 °	2002-07-04	2018-01-31	-
<input type="checkbox"/>	Aerosol angstrom exponent (MODISA_L3m_RRS_8d_4km_v2014)	MODIS-Aqua	8-Daily	4 km	2002-07-04	2017-11-24	-
<input type="checkbox"/>	Aerosol optical thickness at 869 nm (MODISA_L3m_RRS_8d_4km_v2014)	MODIS-Aqua	8-Daily	4 km	2002-07-04	2017-11-24	-



Aerosol Data Analysis: Step 3

- Plot the Data



Output

Aerosol Data Analysis: Step 4

Modify the Output

The screenshot displays the GIOVANNI web interface. On the left, a sidebar shows 'Browse History' with '1. Time Averaged Map' selected, and sub-options for 'User Input', 'Plots', 'Lineage', and 'Downloads'. A blue callout box labeled 'Analysis Details' points to this sidebar. The main map area shows a global map with a color scale for aerosol optical depth (AOD). A 'Map Options' dialog box is open, allowing users to adjust the 'Data Range' (Minimum: 0, Maximum: 1), select a 'Palette' (Cyan-Red-Yellow or Yellow-Orange-Brown), and choose 'Smoothing' (On/Off), 'Projection' (Equidistant Cylindrical), and 'Scaling' (Linear/Log). A blue callout box labeled 'Adjust the Scale' points to the 'Data Range' input fields, and another labeled 'Pick the Colors' points to the 'Palette' selection. On the right, a 'Download' menu offers 'GeoTIFF', 'KMZ', and 'PNG' formats. A blue callout box labeled 'Download the Map' points to this menu. A third blue callout box labeled 'Modify the Plot' points to the 'Options' section of the 'Map Options' dialog, which includes checkboxes for 'Decorations' (Title, Sub-title, Caption, Legend) and 'Supporting Overlays' (Coastlines, Countries, Grid).

Aerosol Data Analysis: Step 5

Download the Data

Earthdata login is required to download the data

Time series area statistics temporarily unavailable ... [1 of 1 messages] [Read More](#)

Browse History

1. Time Averaged Map

..... User Input

..... Plots

..... Lineage

..... Downloads

Click on file links to download. Files contain data portrayed in the plot images.

NetCDF:

[g4.timeAvgMap.MYD08_D3_6_AOD_550_Dark_Target_Deep_Blue_Combined_Mean.20150915-20150930.90E_13S_146E_14N.nc](#)

PNG:

[MYD08_D3_6_AOD_550_Dark_Target_Deep_Blue_Combined_Mean.20150915-20150930.90E_13S_146E_14N.png](#)

GEOTIFF:

[MYD08_D3_6_AOD_550_Dark_Target_Deep_Blue_Combined_Mean.20150915-20150930.90E_13S_146E_14N.geotif](#)

KMZ:

[MYD08_D3_6_AOD_550_Dark_Target_Deep_Blue_Combined_Mean.20150915-20150930.90E_13S_146E_14N.kmz](#)



Aerosol Data Analysis: Step 6

Create Another Plot

Time series area statistics temporarily unavailable ... [1 of 1 messages] [Read More](#)

Browse History

1. Time Averaged Map

..... User Input

..... Plots

..... Lineage

..... Downloads

Click on file links to download. Files contain data portrayed in the plot images.

NetCDF:

[g4.timeAvgMap.MYD08_D3_6_AOD_550_Dark_Target_Deep_Blue_Combined_Mean.20150915-20150930.90E_13S_146E_14N.nc](#)

PNG:

[MYD08_D3_6_AOD_550_Dark_Target_Deep_Blue_Combined_Mean.20150915-20150930.90E_13S_146E_14N.png](#)

GEO TIFF:

[MYD08_D3_6_AOD_550_Dark_Target_Deep_Blue_Combined_Mean.20150915-20150930.90E_13S_146E_14N.geotif](#)

KMZ:

[MYD08_D3_6_AOD_550_Dark_Target_Deep_Blue_Combined_Mean.20150915-20150930.90E_13S_146E_14N.kmz](#)



Aerosol Data Analysis: Step 7

Create an Animation

Time series area statistics temporarily unavailable ... [1 of 1 messages] [Read More](#)

Select Plot

- Maps: Animation *
 Comparisons: Select...
 Vertical: Select...
 Time Series: Select...
 Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD HH:mm
 2015 -09 -15 00 :00 to 2015 -09 -30 23 :59

Valid Range: 2002-07-04 to 2018-02-13

Select Region (Bounding Box or Shape)

Format: West, South, East, North
 90.7031,-13.3594,146.9531,14.76

Select Variables

▼ Disciplines

- Aerosols (187)
- Atmospheric Chemistry (92)
- Atmospheric Dynamics (416)
- Cryosphere (13)
- Hydrology (1083)
- Ocean Biology (72)
- Oceanography (75)
- Water and Energy Cycle (1157)

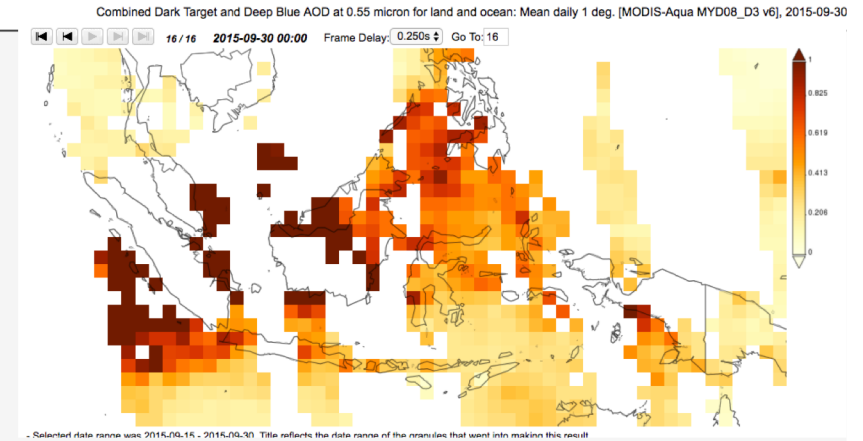
▼ Measurements

- Aerosol Index (5)
- Aerosol Optical Depth (87)
- Air Pressure Anomaly (1)
- Air Pressure (53)
- Air Temperature Anomaly (2)

Number of matching Variables: 0 of 1897 Total Variable(s) included in Plot: 1

Keyword:

	Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units
<input checked="" type="checkbox"/>	Combined Dark Target and Deep Blue AOD at 0.55 micron for land and ocean: Mean (MYD08_D3 v6)	MODIS-Aqua	Daily	1°	2002-07-04	2018-02-13	-



Aerosol Data Analysis: Step 8

Create a Time Series

Time series area statistics temporarily unavailable ... [1 of 1 messages] [Read More](#)

Select Plot

Maps: *Select...* Comparisons: *Select...* Vertical: *Select...* **Time Series: Area-Averaged** Miscellaneous: *Select...*

Select Date Range (UTC)
YYYY-MM-DD HH:mm to YYYY-MM-DD HH:mm
2015 -09 -15 00 :00 to 2015 -09 -30 23 :59
Valid Range: 2002-07-04 to 2018-02-13

Select Region (Bounding Box or Shape)
Format: West, South, East, North
90.7031,-13.3594,146.9531,14.766

Select Variables

Disciplines

- Aerosols (187)
- Atmospheric Chemistry (92)
- Atmospheric Dynamics (416)
- Cryosphere (13)
- Hydrology (1083)
- Ocean Biology (72)
- Oceanography (75)
- Water and Energy Cycle (1157)

Measurements

- Aerosol Index (5)
- Aerosol Optical Depth (87)
- Air Pressure Anomaly (1)
- Air Pressure (53)
- Air Temperature Anomaly (2)
- Air Temperature (96)
- Albedo (24)
- Altitude (8)
- Angstrom Exponent (20)
- Atmospheric Moisture (117)
- Black Carbon (5)
- Buoyancy (2)
- CH4 (17)
- CO (30)
- CO2 (2)

Number of matching Variables: 0 of 1897 Total Variable(s) included in Plot: 1

Keyword :

Variable	Source	Temp.Res.	S
<input checked="" type="checkbox"/> Combined Dark Target and Deep Blue AOD at 0.55 micron for land and ocean: Mean (MYD08_D3 v6)	MODIS-Aqua	Daily	

Figure: Time Series, Area-Averaged of Combined Dark Target and Deep Blue AOD at 0.55 micron for land and ocean: Mean daily 1 deg. [MODIS-Aqua MYD08_D3 v6] over 2015-09-15 - 2015-09-30, Region 90.7031E, 13.3594S, 146.9531E, 14.7656N

Date	AOD (Unitless)
15 Sep 2015	0.28
16 Sep 2015	0.30
17 Sep 2015	0.33
18 Sep 2015	0.43
19 Sep 2015	0.51
20 Sep 2015	0.44
21 Sep 2015	0.47
22 Sep 2015	0.45
23 Sep 2015	0.45
24 Sep 2015	0.43
25 Sep 2015	0.51
26 Sep 2015	0.38
27 Sep 2015	0.45
28 Sep 2015	0.47
29 Sep 2015	0.46
30 Sep 2015	0.51



Questions for Discussion

- Describe the aerosol maps created using the Giovanni exercise.
- What is the maximum Aerosol Optical Depth reported on the map?
- What is the observed trend in aerosols over your location? Explain.
- Do you have any prior knowledge about the observed trends in aerosols in your region? How can you verify them using an independent data set?
- What is the seasonal variability (if it exists) in the observed trend?

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

