

Access to Remote Sensing SO₂ via Giovanni

Go to the GIOVANNI home page: <http://giovanni.gsfc.nasa.gov>

Scroll down the list under 'Giovanni Portals' tab in the 'Atmospheric Portals' menu and click on "Aura OMI Level 3".

PART 1 – PBL SO₂ Column Product.

Enter/choose the following parameters:

Spatial

Enter the following values into the boxes next to "Area of Interest"

Location 1: West=68 North=35 South=5 East =90

Parameter: Vertical Column Amount SO₂ (PBL)

Temporal

Begin Date = June 1, 2005

End Date= August 31, 2005

Select Visualization: Lat-Lon Map, Time Averaged.

Edit Preferences

Select 'Custom' in the Color Bar Mode and enter Parameter Min 0 Parameter Max 0.8

Select NO for Smooth Flag

- Click "**Generate Visualization**" and take a minute to observe the results.
- Click on the 'Download Data' tab just above the plot and download the KMZ file to view on Google Earth.

Create a second plot with Temporal Begin Date = June 1, 2013 End Date = August 31, 2013.

- Generate visualization and download the KMZ.

1) *Open the KMZ files you just downloaded in Google Earth.*

2) *Describe the differences between the two time periods:*

a. *Which year is higher? _____*

b. *Write two major cities which have increased or decreased between 2005 and 2013*

City 1: _____ Latitude: _____

Longitude: _____

City 2: _____ Latitude: _____
Longitude: _____

- c. *Estimate the difference in the amount of SO₂ between the two years for both cities by either looking at the color scale or downloading the ASCII files from GIOVANNI and finding the closest latitude/longitude location.*

City 1 2013 – 2005 = _____ DU

City 2 2013 – 2005 = _____ DU

NOTE: Think about doing monthly plots to contrast years, or highlight regions where there is intense industrial activity. Note: Averaging a few days, to monthly mean SO₂ (or in some cases composites) are recommended. Daily values tend to be sparse and noisy.

Part 2 – NO₂ Tropospheric Column

Spatial: Same location in Part 1 above

Parameter: NO₂ Tropospheric Column Amount (Cloud-Screened at 30%)

Temporal

Begin Date = January 1, 2005

End Date= March 31, 2005

Select Visualization

Lat-Lon Map, Time Averaged.

Edit Preferences

Select 'Custom' in the Color Bar Mode and enter Parameter Min 0 Parameter Max 8

Select NO for Smooth Flag

- Click “**Generate Visualization**” and take a minute to observe the results.
- Click on the ‘Download Data’ tab just above the plot and download the KMZ file to view on Google Earth.

Create a second plot with Temporal Begin Date = June 1, 2013 End Date = August 31, 2013.

- Generate visualization and download the KMZ.

3) *View the KMZ's in Google Earth and answer the same questions in Part 1 but this time for NO₂:*

4) Describe the differences between the two time periods:

- a. Which year is higher? _____
- b. Write two major cities which have increased or decreased between 2005 and 2013
City 1: _____ Latitude: _____
Longitude: _____

City 2: _____ Latitude: _____
Longitude: _____
- c. Estimate the difference in the amount of NO₂ between the two years for both cities by either looking at the color scale or downloading the ASCII files from GIOVANNI and finding the closest latitude/longitude location.

City 1 2013 – 2005 = _____ molecule/cm²
City 2 2013 – 2005 = _____ molecule/cm²

You have the option to include the resulting GIOVANNI images for 2005 and 2013 SO₂ and NO₂ maps with your answers.

[you can send your imaged to Jacquelyn.Witte@nasa.gov](mailto:Jacquelyn.Witte@nasa.gov)

PART 3

After completing all the answers in this document, click on the following link and enter your answer to online form for reporting. This step is mandatory to submit your assignment.

[Click Here](#)

Or type following url in your address bar

https://docs.google.com/forms/d/1jQ_Ofw3Y7HFbnBtkHFDYmWszTKrcTJZCVjRGwSpI_RE/viewform