

### **STEP 1:**

Go to the main Giovanni web page: <http://disc.sci.gsfc.nasa.gov/giovanni>

**Note:** start with the current interface. If you have time, try these exercises in Giovanni-4 at: <http://giovanni.gsfc.nasa.gov/giovanni/>.

### **STEP 2: Access Giovanni Air Quality Products**

Click on 'Air Quality' under "Application and Education Portals"

### **STEP 3: Generating Maps of Air Quality Products**

1. Spatial Selection: Click on the map and with the mouse select a box that includes California. Alternatively, enter the latitudes and longitudes in the boxes below the maps
  - a. North: 49°, South: 26°, East: -62°, West: -93°
2. Parameter Selection - select the boxes for the two following parameters:
  - a. Fine Particulate Matter – PM2.5
  - b. MODIS Aerosol Optical Depth at 550 nm (first parameter under MODIS - Terra)
3. Temporal Selection: Begin Date = 2012, July 28th, End Date = 2012, July 18th
4. Select Visualization: Lat-Lon Map, Time-Averaged. We will refer to this as visualization A
5. Repeat this visualization but change the end date to July 1, 2012. We will refer to this as visualization B
6. Repeat this visualization but change the start and end date to June 29, 2012. We will refer to this as visualization C

### **STEP 4: Qualitative Interpretation of Results**

Compare the particulate matter map (PM2.5) to the MODIS Aerosol Optical Depth and answer the following questions and report your answers in the Word file.

Answer the first three questions for visualization A

1. Describe the spatial patterns of AOD. How is AOD spatially distributed? Where are the highest and lowest AOD values geographically?
2. Describe the spatial patterns of PM<sub>2.5</sub>. How is PM<sub>2.5</sub> spatially distributed? Where are the highest and lowest values geographically?
3. Compare the spatial distributions of AOD and PM<sub>2.5</sub>. Are they similar or different? Why?
4. There is one area where the PM 2.5 is high yet the AOD is low. Give at least two reasons why this may have occurred.

Consider visualizations A, B and C

5. How well do the satellite and PM<sub>2.5</sub> spatial distributions match across the different time scales?
6. What can you do with visualization B to achieve a better spatial match between the satellite AOD and PM 2.5?

#### **STEP 5: Visualization on Google Earth and download of data files**

1. At the top of the page click on the “Download Data” tab.
2. To view the images on Google Earth, click on the KMZ icon, upload to Google Earth directly or choose to save the file, open Google Earth, and then open the file after you start Google Earth.

#### **Optional: STEP 7: Further investigation of GIOVANNI PM 2.5**

##### **Giovanni Air Quality Case Study: Fires in June and July, 2008 and Poor Air Quality in Northern California**

Hundreds of wildfires broke out in several locations in Northern California in June and July 2008, burning thousands of acres and leading to health related air quality alerts due to the smoke. The fires also resulted in extensive evacuations and property damage. You will use the tools provided in Giovanni and GoogleEarth to explore and analyze this event. Report your findings in a Word file.

1. Spatial Selection: Click on the map and with the mouse select a box that includes California. Alternatively, enter the latitudes and longitudes in the boxes below the maps
  - a. North: 45°, South: 28°, East: -110°, West: -127°

2. Parameter Selection - select the boxes for the two following parameters:
  - a. Fine Particulate Matter – PM<sub>2.5</sub>
  - b. MODIS Aerosol Optical Depth at 550 nm (first parameter under MODIS - Terra)
3. Temporal Selection: Begin Date = 2008, June 24th, End Date = 2008, June 24th
4. Select Visualization: Lat-Lon Map, Time-Averaged

What do the missing areas of PM 2.5 tell you?