**Satellite Remote Sensing of Particulate Matter Air Quality: Data, Tools, Methods, and Applications (aka AOD-PM)**

Week 3 Homework Assignment: Hands-on experience with GIOVANNI tools for MODIS Level 3 aerosol data sets.

**Exercise – Step by Step**

Step 1: Go to <http://giovanni.sci.gsfc.nasa.gov>

Step 2: Explore different sections (plotting options) on the website and familiarize yourself with some of the information, data, and services available through this web portal.

Step 3: Generate a spatial distribution map of aerosol optical depth from MODIS and MISR sensors using the following search criteria:

* Select plot type as Maps: Time Averaged Map
* Select variables:
  + Disciplines: Aerosols
  + Platform/Instrument: MISR, MODIS-Aqua
  + Temporal Resolutions: monthly
* Select Aerosol Optical Depth 550 nm (Deep Blue, MYDO08\_M3\_v6) and Aerosol Optical Depth 55 nm (MIL3MAE\_v4)
* Select Date Range: Jan 2005 – Dec 2010
* Select 10x10 degree box centered around the city where you live (make sure to select the same city as you did in weeks 1 and 2)
* Plot the maps of AOD
* Readjust the color scales to make them exactly the same for both AOD maps
* Download the maps in .png and KMZ format

**Questions**

1. Name of the city for which data was downloaded:
2. What is the maximum value of AOD observed in the map of MODIS AOD?
3. What is the maximum value of AOD observed in the map of MISR AOD?
4. Spatial patterns in AODs from the two sensors are:
   1. Similar
   2. Different
   3. More similarities than differences
   4. More differences than similarities
   5. Not sure
5. Why are the MODIS and MISR AOD maps different? Provide two reasons.
6. Why are the MODIS and MISR AOD maps similar? Provide two reasons.
7. Can you identify any major source of aerosols in any of the two maps of your region? (i.e. a particular city, power plant, industrial area, etc. Look for high AOD regions)
   1. Yes
   2. No
8. Open the downloaded KMZ file in Google Earth and try to identify regions or cities with the highest AOD value. (List cities and corresponding AODs, and describe your analysis after opening the map in Google Earth.)
9. Do you see any advantages to opening AOD maps in Google Earth? If yes, please explain.