



Satellite Remote Sensing of Air Quality
November 18-19, 2018, Dehradun, India

Case Study and Outline

In this exercise, you will analyze an air quality event as a team. The goal is to make use of as many of the relevant resources presented in this training as possible, as well as any data you wish to include. Conceptually, think of this as a story using images and data to reinforce the points you want to make. Your case study will be presented here; you will make a **PowerPoint presentation** and other tools to present your case study. Plan on **5 minutes** for your presentation, so that we can accommodate each group.

Conducting the Case Study

1. Find a group of 4-5 people to work on your case study. Determine what dates, source, and receptor regions you wish to examine. As a basis for your case study, you can use one of the suggested events below, or a case study of your choosing.

Suggested Case Studies

1. Fires and Smoke in North Western India, November 5, 2012
 - a. <https://earthobservatory.nasa.gov/NaturalHazards/view.php?id=79630>
2. Dust over Arabian Sea
 - a. <https://earthobservatory.nasa.gov/NaturalHazards/view.php?id=84554>
3. Fires and smoke in Uttarakhand, India, April 2016
 - a. <https://go.nasa.gov/2qfRDTt>
4. Mount Sinabung Volcanic Eruption – Feb 19, 2018
 - a. https://earthobservatory.nasa.gov/NaturalHazards/view.php?id=91753&eo_cn=home&eoci=nh
5. Mount Agung Volcanic Eruption – Nov 27, 2017
 - a. <https://earthobservatory.nasa.gov/IOTD/view.php?id=91329>
6. Fires and Smoke – September 2015
 - a. <https://earthobservatory.nasa.gov/IOTD/view.php?id=87119>
 - b. <https://earthobservatory.nasa.gov/blogs/earthmatters/2016/08/05/just-how-bad-was-the-2015-fire-season-in-indonesia/>
7. Smoke Engulfs Singapore – June 19, 2013
 - a. <https://earthobservatory.nasa.gov/IOTD/view.php?id=81431>
8. Air Quality Emergency in Malaysia – August 10, 2005
 - a. <https://visibleearth.nasa.gov/view.php?id=15336>
9. Fires in Northern Australia – June 9, 2014



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- a. <https://earthobservatory.nasa.gov/NaturalHazards/view.php?id=83878>
10. Oil fire in Iraq – June 13, 2016
 - a. <http://go.nasa.gov/2d14uTf>
11. Dust transport across the Pacific – April 4-14, 2014
 - a. <http://go.nasa.gov/2d14SRG>
12. Dust transport across the Atlantic – April 2014.
 - a. <http://go.nasa.gov/2clnyrE>
13. Haze over Eastern Asia – February 25, 2014
 - a. <http://earthobservatory.nasa.gov/IOTD/view.php?id=83213>

Other Resources

- NASA Earth Observatory:
<http://earthobservatory.nasa.gov/NaturalHazards/event.php?id=81040>
 - The Smog Blog: <http://alg.umbc.edu/usaq/>
 - NASA Worldview – Event Section: <https://worldview.earthdata.nasa.gov/>
2. Identify the resources you wish to use and list these in the **case study resources** (a useful space for tools and data at the end of this document).
 - You should make use of any and all course materials (including instructors) to identify resources for each area listed on the resource sheet. There are some useful hints and tips in the rest of this guide – so read through this document before proceeding to fill out the user guide.
 3. Once you have identified the resources, begin assembling the data you will use. It will be more efficient to divide this task among the people in your group. We strongly suggest that in this step and the next, you begin to write the information in a document as a guide for your presentation.
 4. Organize the information you have gathered so that it can be presented using your platform(s) of choice and practice telling your story.
 5. The presentation should include event description, data sets used, Tools used and the analysis performed with summary of your experience.
 6. Give your presentation. Select one ~~victim~~ person to make the presentation, or you can have several people take turns each presenting one piece.



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Additional Resources

We suggest that your group first compile a list of available resources. Since this is mostly a visual presentation, consider sources that can provide visual context on Google Earth as well as numerical values, either in Google Earth or from other sources. Some other suggestions that you may have missed, or may not have been adequately covered in the training.

Model Data

The link below is the download for the FLAMBE data from the Naval Research Lab. To select a different date, modify the month and month and day in the last two fields of the URL.

- http://www.nrlmry.navy.mil/aerosol/kml/older_flambe_world_kml/201109/20110913_fire_global.kml
- NASA Global Forecasting - <https://fluid.nccs.nasa.gov/weather/>

Meteorology

- Weather Underground, <http://wunderground.com>
 - Enter the name of a city in your area of study into the search bar. Scroll down to the **History and Almanac** section, and enter the date

Ground Based Aerosol Data

This is relevant if you are using the synergy tool

- EPA Data Mart: <http://www.epa.gov/airdata/>
- NOAA STAR: <http://www.star.nesdis.noaa.gov/smcd/spb/aq/>
- AQICN.org: <http://aqicn.org/>
- OpenAQ: <http://openaq.org/>

Useful Data and Tools:

- Earth Observatory (starting point: California Rim Fires, August 26, 2013): <http://earthobservatory.nasa.gov/NaturalHazards/event.php?id=81040>
- Worldview: <http://worldview.earthdata.nasa.gov/>
- MODIS Atmosphere Site: <http://modis-atmos.gsfc.nasa.gov/IMAGES/index.html>
- IDEA (KML files): <http://www.star.nesdis.noaa.gov/smcd/spb/aq/index.php>
- Air Data: <http://www.epa.gov/outdoor-air-quality-data>



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- AERONET Data Synergy Tool: http://aeronet.gsfc.nasa.gov/cgi-bin/bamgomas_interactive
- Giovanni-4: <http://giovanni.gsfc.nasa.gov/giovanni/>
- Smog Blog: <http://alg.umc.edu/usaq/>
- CALIPSO Browse Images (can provide a vertical profile): https://www-calipso.larc.nasa.gov/products/lidar/browse_images/show_calendar.php
- MODIS Dark Target Algorithm: <http://darktarget.gsfc.nasa.gov/>
- MODIS Deep Blue Algorithm: <http://deepblue.gsfc.nasa.gov>
- Satellite Surface Comparisons, MAPSS: <http://giovanni.gsfc.nasa.gov/mapss/>
- OMI NO₂ Data and Applications: <http://airquality.gsfc.nasa.gov/>