

## **METADATA:**

Each raster file contains data for one pollutant (NO<sub>2</sub>, O<sub>3</sub>, PM<sub>2.5</sub>, and PM<sub>10</sub>) for one month of one year (1998–2009 for NO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub>; 1999–2009 for PM<sub>2.5</sub>). Monthly files contain average concentrations for all hours of the day (average of 24 hours). An annual average dataset is included for each year for each pollutant.

The units of NO<sub>2</sub> and O<sub>3</sub> are ppb. The units of PM<sub>2.5</sub> and PM<sub>10</sub> are ug/m<sup>3</sup>. The values are estimated from the monthly air quality data measured at 4 closest locations within 50 km of the grid point by inverse distance squared interpolation. Missing values are coded as “-99”. Missing values occur because locations are >50 km from the closest measurement station with valid data for a specific month. The domain extends from 32.5 to 35.5 degrees latitude and from -121.05 to -114.1 degrees longitude. The grid point spacing is 0.01 degrees latitude and 0.01 degrees longitude. Each individual raster is ~1.6 MB.

Prepared for USC NIEHS by Fred Lurmann, Sonoma Technology, Inc., 11-2-2016. Converted for USC NIEHS and shared as map image data services by USC Spatial Sciences Institute, 2017.

## **TO ACCESS AND DOWNLOAD DATA:**

Rasters are “Mosaic Datasets” shared as “Image Services” with ArcGIS Online using ArcGIS for Server. Each pollutant (NO<sub>2</sub>, O<sub>3</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>) is a separate image service that includes the monthly (January-December) and annual averages for 1998–2009 (NO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub>) or 1999–2009 (PM<sub>2.5</sub>), for a total of 143 “Layers.”

**Access these data through the Keck School of Medicine of USC ArcGIS Online account:** <http://keck.maps.arcgis.com/home>

**You must have ArcGIS Desktop software (“ArcMap”) installed on your computer.** Do you need a newer software version? To obtain Esri software through the USC Spatial Sciences Institute, please see <http://spatial.usc.edu/index.php/software/proprietary-software-free/> (ArcMap is free for students) or

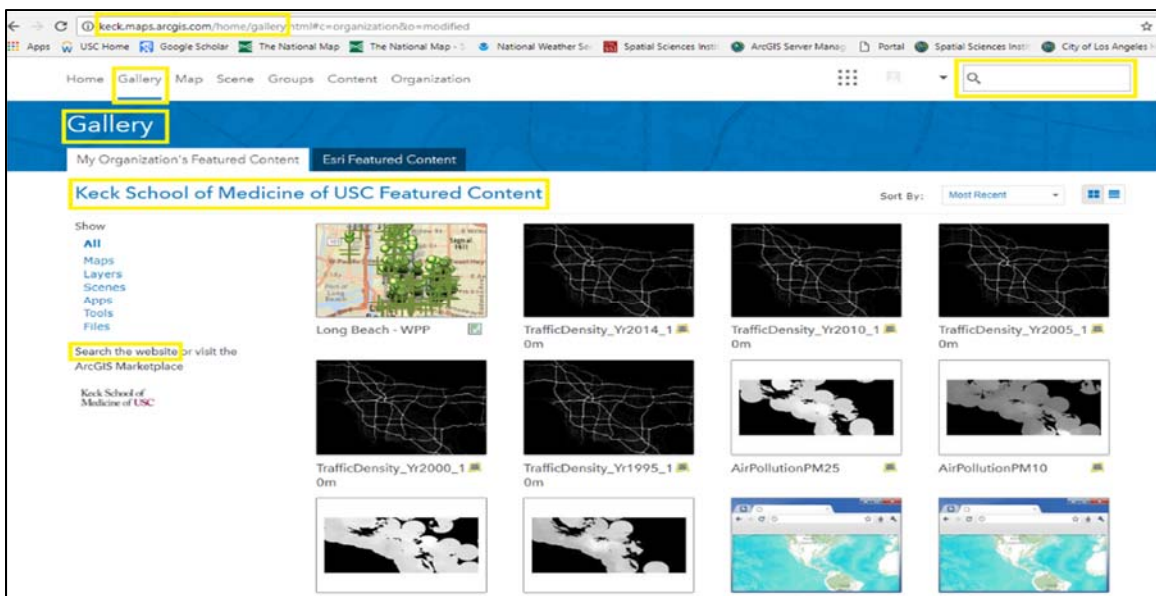
<http://spatial.usc.edu/index.php/software/proprietary-software> (faculty, postdoctoral associates, or staff).

**To download data for analysis, you will first add the selected service/s to an ArcMap (ArcGIS Desktop or ArcGIS Pro) map document.** You may then select individual (or all) layers from a service to download separately. We tested this on a PC with ArcMap versions 10.5.1, 10.5, and 10.4; it will also work with 10.3.

**Where are the data? Layers are uploaded to the Keck School of Medicine of USC ArcGIS Online account.** ArcGIS Online is a collaborative web GIS. The data layers are shared with “Everyone.” **Go to the Keck School of Medicine of USC ArcGIS Online account: <http://keck.maps.arcgis.com/home> and sign in to ArcGIS Online.**

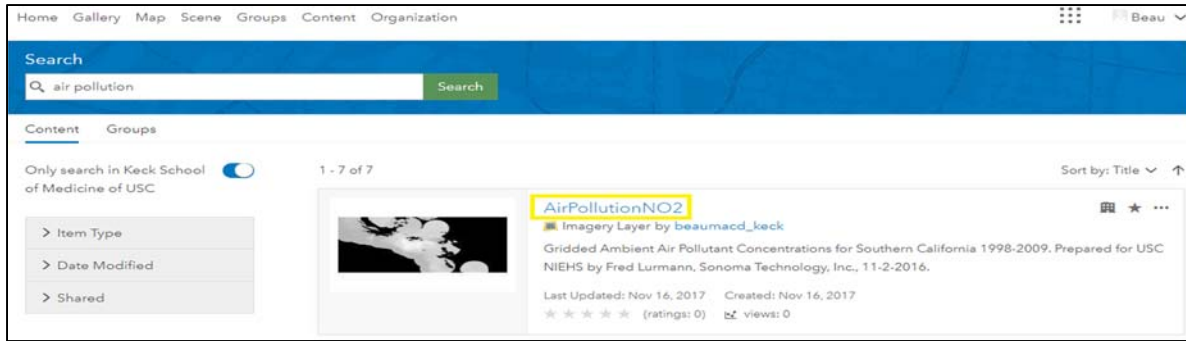
**Use the top Menu Bar to access the “Gallery” and “Keck School of Medicine of USC Featured Content.”**

Your monitor should look similar to the screenshot below. There are many ways to sort, filter, and search for data and information in ArcGIS Online. Enter search terms in the search box at the top right.

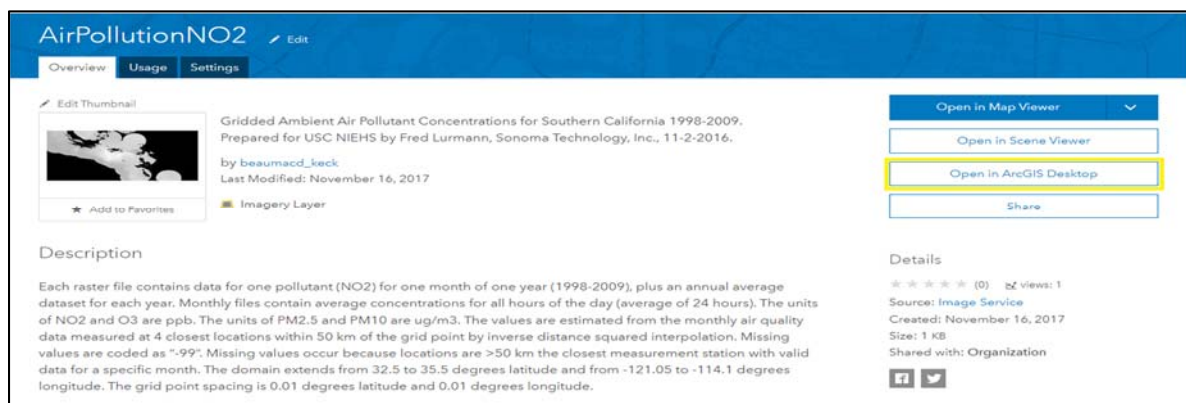


Search results using “**air pollution**” key words are shown.

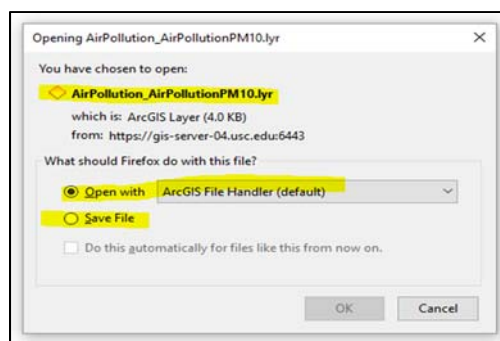
**File/service/layer names are AirPollutionNO2, AirPollutionO3, AirPollutionPM25, and AirPollutionPM10.** Choose ONE dataset to download first. Click the name (e.g., “AirPollutionNO2” below) in the search results to access more details and the data.



More information and options are here. This is an example for the NO2 Air Pollution raster mosaic dataset. Click on “Open in ArcGIS Desktop” at the top right of the page:

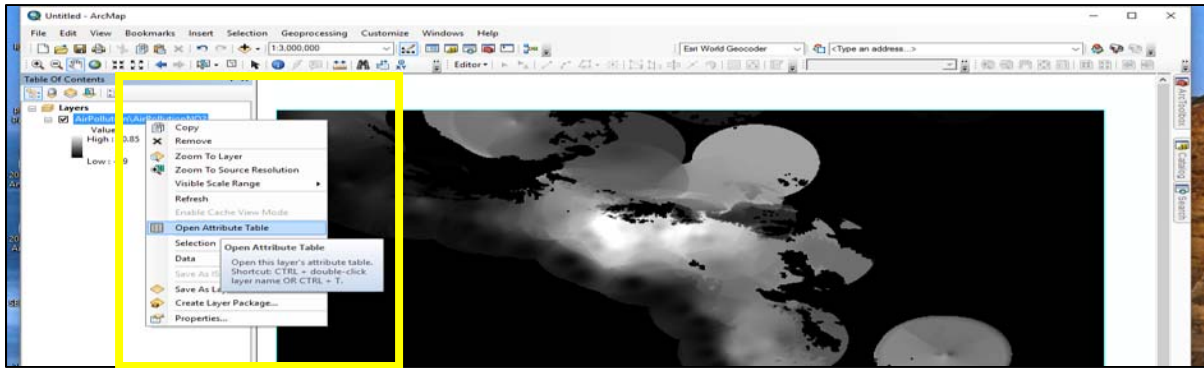


A GIS layer file will download to link you to the data. Open in ArcGIS Desktop (“ArcMap”) using the default choice or save the file first to a location you select:



From ArcMap, you can export the rasters. You can either export all of them or a selection set.

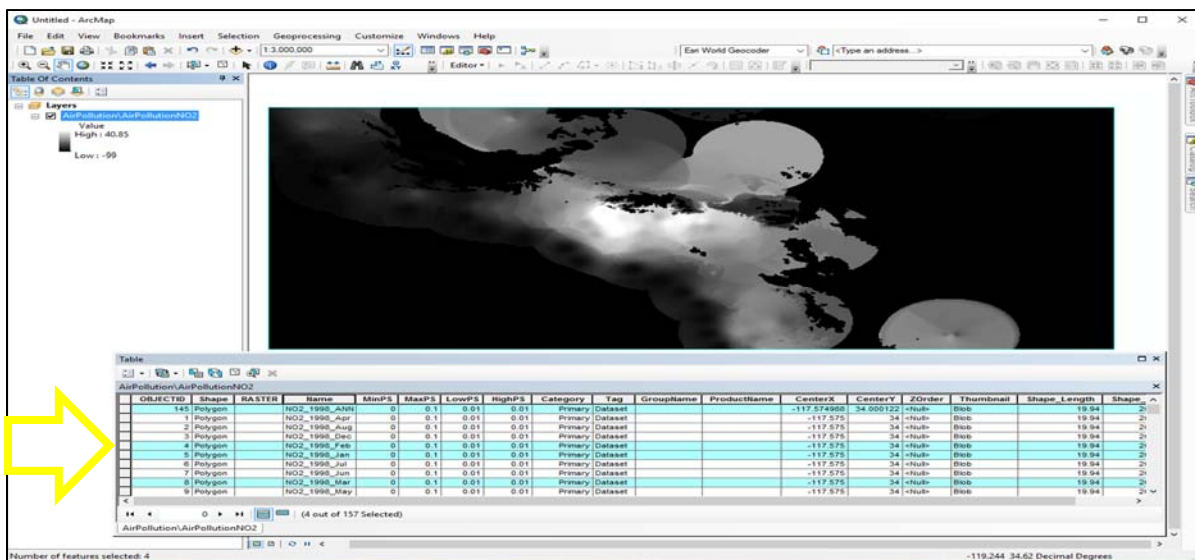
In ArcMap, right-click on the layer in the Table of Contents (left window) and click “**Open Attribute Table**”:



When the table opens, click the box to the left in the rows in the attribute table to select rasters to download.

Sort alphabetically by clicking on the Name field.

Four NO2 rasters are selected in the example below: January, February, and March 1998, and the 1998 annual average. You may select one or all rasters to download.



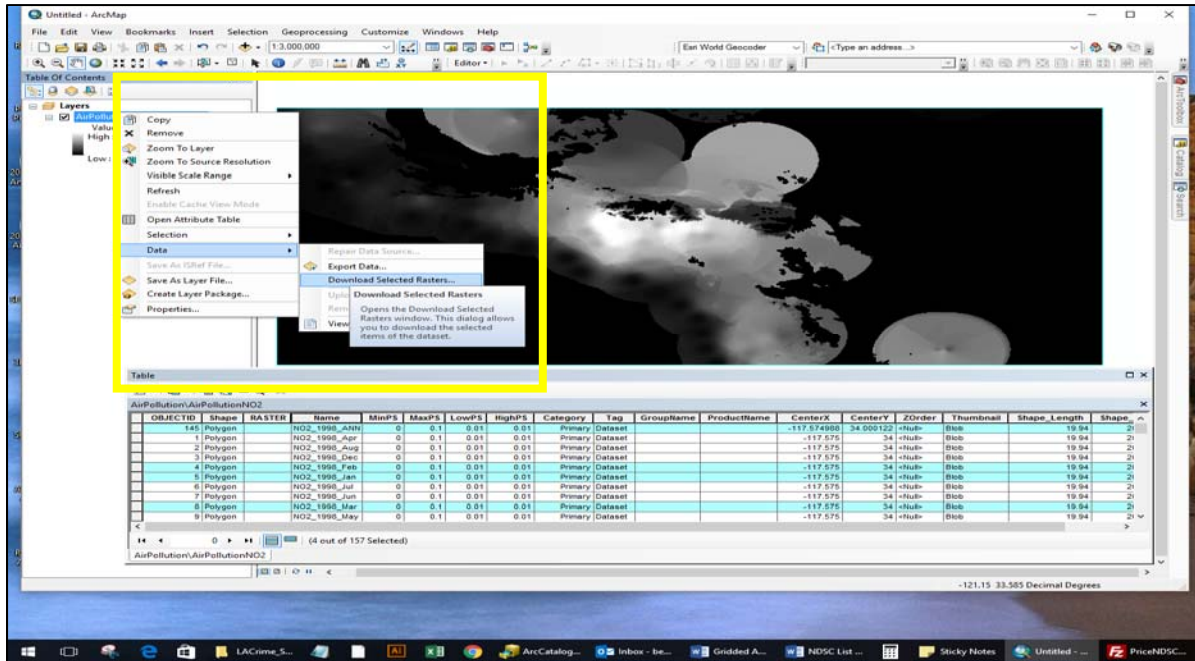
Note: Notice that since all the rasters have the same “footprint” or spatial extent, they draw on top of each other. If you click on the map – either here (using the “i” identify button) or in the online viewer (just click) – you access a popup window with pollutant information for ALL 143 layers at that individual point.

Note: To just view the images rather than download data, click the layer image in the search results or “Open in Map Viewer” to open it in the Online Map Viewer.

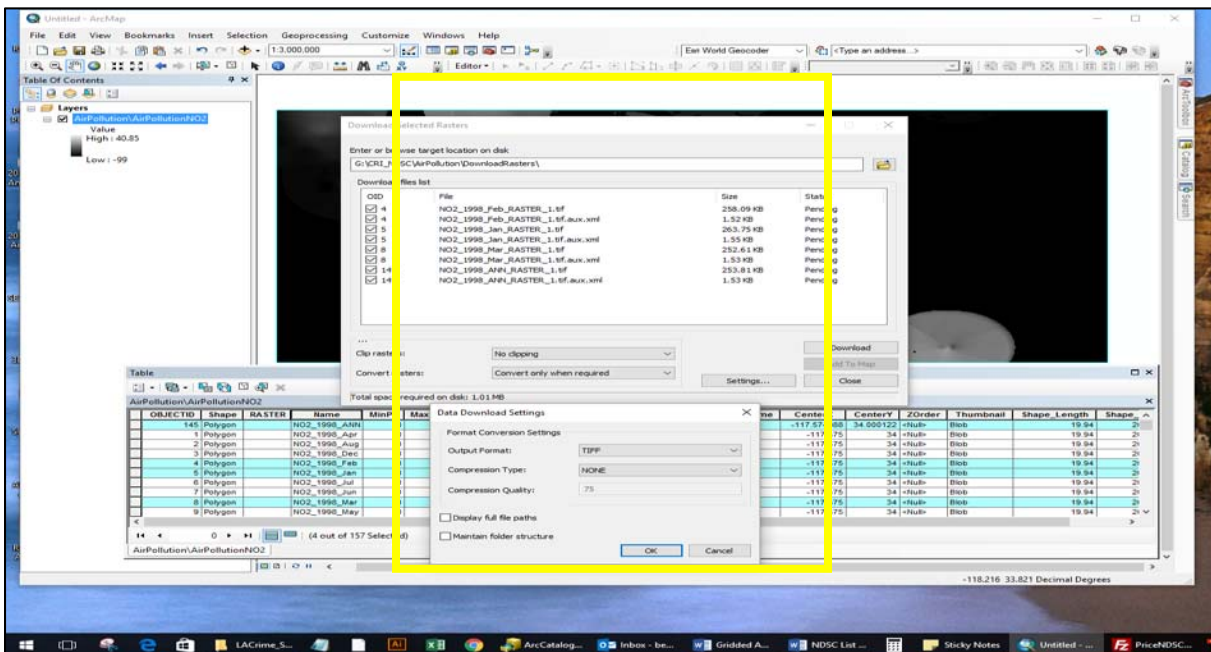
After selecting rasters to download, right-click the layer in the Table of Contents.

**Data > Download Selected Rasters.**





Indicate where to save the file/s. Select file format desired; default is TIFF, but you may choose something else.



Repeat the process to access multiple sets for all pollutants.

“Image Service” downloads are like any other rasters and can be used in spatial analyses as desired. ArcGIS has extensive online help files accessed with “Help” on the top Menu Bar. Pollutant data use the ArcGIS Online data convention of a **WGS84 Geographic** “projection” – you may re-project downloaded data using GIS software.

**FURTHER HELP:**

Faculty, staff and/or students with additional questions can contact [spatial\\_support@usc.edu](mailto:spatial_support@usc.edu) or check the Spatial Sciences Institute website for the days and times “office” hours are scheduled (see <https://spatial.usc.edu/index.php/help-desk/> for additional details).