Measurements taken by students using the GLOBE and Calitoo sun photometers can be used to students at the level requested, via email, phone or video conferencing. Support was provided to each teacher and their grade level of students, whether in middle school or high school.

The participating schools experienced mostly cloudy skies throughout the Campaign resulting in sparse data collection. However the Alberta Canada fire, which started May 1, impacted all the participating schools during the month of May and can be seen in the data. Often schools have a single or a few data points in the same day among many days of no observations, so its difficult to gain an understanding of the value of the data without seeing it in the larger context.

The majority of the participating schools are located along the east coast, with many located near AERONET and/or PM$_2.5$ monitoring sites.

By examining AOT from satellites and surface AERONET sites and incorporating PM$_2.5$ measurements, it is easier to see how the student observations capture the fire event. The GLOBE photometers measure AOT in the column of air above the student, 'looking up', while AOT can be derived from satellites 'looking down' over large areas. However neither of these measurements tells anything about the vertical distribution of the measured aerosol. At the surface, where we breath, the PM$_2.5$ (particulate with sizes 2.5 microns or less) is measured. From the CALIPSO satellite, the vertical distribution of aerosol is derived but for narrow paths. So by combining all these measurements it becomes clear what is really happening. All the satellite, smoke map and PM data are easily accessible to students to use in their own analysis. A good resource is the IDEA website located at http://www.star.nesdis.noaa.gov/smcd/spb/aq/.

Using CALIPSO for Data Analysis

The CALIPSO satellite detected the smoke from the Alberta Canada fire. Students measuring aerosol can detect such events and use images from CALIPSO to analyze their measurements. The path of the satellite is shown in the upper left. The backscatter plots show evidence of aerosol. The vertical feature mask plot confirms aerosol aloft. Then the aerosol subtype plot confirms the aerosol is smoke. www.calipso.larc.nasa.gov/products/kidar/browse_images/show_calendar.php.

On May 12, 2016 an elevated AOT can be seen in the MODIS plots to the right. This was also captured by the students at Pan American High School shown to the left. Students at Northbrook High School measured AOT throughout a single day. Their measurements compare well with AERONET as shown below.

Future Opportunities

If you are interested in participating in the 2016 Fall Aerosol Campaign contact Dr. Margaret Pippin at mpippin@nasa.gov or Jessica Taylor at jessica.taylor@nasa.gov. Chris Marentette and Robert Bujosa participated in LEARN Long Term Engagement with Authentic Research at NASA for two years. Both the teachers participated in the 2015 Spring Aerosol Campaign and are analyzing the data for their poster during their Summer 2016 Teacher Internship at NASA.