

[Fresno Bee Earth Blog, Monday, Jan. 14, 2013:](#)

Beijing pollution siege well beyond Valley problems

by Mark Grossi

Beijing's particle pollution this past week was about 25 times worse than the threshold for the San Joaquin Valley's wood-burning ban. Has the Valley ever seen levels that high?

Yes, but only for an hour or two. It sometimes happens after fireworks celebrations on the Fourth of July.

Numbers explain it best. The threshold for banning wood-burning in fireplaces here is about 30 micrograms per cubic meter of air. The federal standard is 35. Check out the Valley's January violations [here](#).

The U.S. Embassy in Beijing reported 886 micrograms last week. Schools kept children indoors. Hospitals saw a 20% jump in patients with respiratory problems.

This pollution is called PM-2.5 — microscopic specks that cannot be seen by the naked eye. Thirty of these specks side-by-side would span the width of a human hair. They are bits of soot, moisture and various chemical debris.

These specks can penetrate deep in the lungs, pass into the blood system and lodge in the body's organs. Scientists have linked them to lung and heart disease as well as early mortality.

Major NASA Air Pollution Study To Fly Over California

By [NASA](#)

Sacramento Bee, January 11, 2013

WASHINGTON -- /PRNewswire-USNewswire/ -- A multi-year NASA airborne science mission is on its way to California to help scientists better understand how to measure and forecast air quality globally from space. Two NASA aircraft equipped with scientific instruments will fly over the San Joaquin Valley between Bakersfield and Fresno in January and February to measure air pollution. One aircraft will fly within 1,000 feet of the ground.

The aircraft are part of NASA's five-year DISCOVER-AQ study, which stands for Deriving Information on Surface conditions from Column and Vertically Resolved Observations Relevant to Air Quality. Its researchers are working to improve the ability of satellites to consistently observe air quality in the lowest part of the atmosphere. If scientists could better observe pollution from space, they would be able to make better air quality forecasts and more accurately determine where pollution is coming from and why emissions vary.

A fundamental challenge for space-based instruments monitoring air quality is to distinguish between pollution high in the atmosphere and pollution near the surface where people live. DISCOVER-AQ will make measurements from aircraft in combination with ground-based monitoring sites to help scientists better understand how to observe ground-level pollution from space.

"DISCOVER-AQ is collecting data that will prepare us to make better observations from space, as well as determine the best mix of observations to have at the surface when we have new satellite instruments in orbit," said James Crawford, the mission's principal investigator at NASA's Langley Research Center in Hampton, Va. "NASA is planning to launch that satellite instrument, called TEMPO, in 2017."

Because many countries, including the United States, have large gaps in ground-based networks of air pollution monitors, experts look to satellites to provide a more complete geographic perspective on the distribution of pollutants.

A fleet of Earth-observing satellites, called the Afternoon Constellation or "A-train," will pass over the DISCOVER-AQ study area daily in the early afternoon. The satellites' data, especially from NASA's Aqua and Aura spacecraft, will give scientists the opportunity to compare the view from space with that from the ground and aircraft.

"The A-Train satellites have been useful in giving us a broader view of air pollution than we've ever had before," said Kenneth Pickering, DISCOVER-AQ's project scientist at NASA's Goddard Space Flight Center in Greenbelt, Md. "DISCOVER-AQ will help scientists interpret that data to improve air-quality analysis and regional air quality models."

Test flights are scheduled to start Jan. 16 with science flights continuing through mid-February. A four-engine P-3B turboprop plane from NASA's Wallops Flight Facility in Wallops Island, Va., will carry eight instruments. A two-engine B200 King Air aircraft from Langley will carry two instruments. Sampling will focus on agricultural and vehicle traffic areas extending from Bakersfield to Fresno. The flight path passes over six ground measurement sites operated by the California Air Resources Board and the San Joaquin Valley Air Pollution Control District.

The 117-foot-long P-3B will fly spiral flights over the ground stations. These flights will be from an altitude of 15,000 feet to as low as 1,000 feet. They will sample air along agricultural and traffic corridors at low altitudes between the ground stations. The smaller B200 King Air will collect data from as high as 26,000 feet. The plane's instruments will look down at the surface, much like a satellite, and measure particulate and gaseous air pollution. The two airplanes will fly from NASA's Dryden Aircraft Operations Facility in Palmdale, Calif.

The DISCOVER-AQ mission is a partnership with the National Oceanic and Atmospheric Administration, the U.S. Environmental Protection Agency, and University of California campus branches in Berkeley, Davis, Irvine, and Santa Barbara. Other partners in the California campaign include the National Center for Atmospheric Research; the University of Maryland in College Park and Baltimore County; University of Colorado, Boulder; Pennsylvania State University, State College; University of Innsbruck in Austria; and Millersville University, Millersville, Penn.

DISCOVER-AQ is an Earth Venture mission, part of the Earth System Science Pathfinder program managed at Langley for the Earth Science Division of NASA's Science Mission Directorate in Washington.