Atmospheric scientists start monthlong air sampling campaign

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More than 60 scientists from a dozen institutions have converged on this urban area to study how tiny particles called aerosols affect the climate. Sending airplanes and weather balloons outfitted with instruments up in the air, the team will be sampling aerosols in the Sacramento Valley from June 2-28.

Researchers from the Department of Energy's Pacific Northwest National Laboratory in Richland, Washington will be leading the monthlong study, coordinating air and ground operations at three sites in the Central Valley. Participating scientists hail from several DOE national laboratories, NASA and the University of California, Davis, along with many other academic and research institutions. The data they are collecting will help researchers improve computer models that simulate the climate and project climate changes.

One of the areas of climate science that researchers know the least about is aerosols, the tiny particles of dust, soot, salts, water and other chemicals suspended in the air. A hazy day? That is mainly caused by aerosol particles scattering and absorbing sunlight.

To better understand aerosols' role in climate, the DOE's climate research program studies how aerosol particles in the air scatter and absorb the sun's radiation, and how much of it hits Earth.

This Atmospheric Radiation Measurement (ARM) Climate Research Facility study, called the Carbonaceous Aerosols and Radiative Effects

Study (CARES), is looking at aerosols that have a bit of black carbon and organic chemicals in them. These can come from vehicle exhaust, fires -- even plants give off carbon-containing compounds that find their way into aerosols.

The team of researchers will take daily measurements of trace gases and aerosols the city emits -- known as the Sacramento urban plume -- under relatively well-defined and regular weather conditions. The knowledge gained will eventually be used in regional and global computer models that simulate the effects of aerosols on climate.

About half of the researchers will take measurements on the ground at two sites - one at American River College in Sacramento and the other at Northside School in Cool, Calif. The rest of the team will take similar measurements from the air using a full payload of instruments -- some recently purchased with American Recovery and Reinvestment Act funds -- flown on a Gulfstream-1 aircraft at about 1,000 feet. NASA will fly a King Air B-200 above the G-1 at 28,000 feet.

In addition, the team will be sending weather balloons up for additional sampling from the ground sites. The simultaneous measurements from ground, plane and balloon will provide a comprehensive view of the atmospheric aerosols.

Provided by Pacific Northwest National Laboratory