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EMSL Spotlight

# EMSL Experts Participate in International Atmospheric Field Campaign

*Scientists bring expertise, instruments to Chile to gather data on atmospheric aerosols*

Working with data recently released from a fall campaign that drew 150 scientists, 5 research aircraft, and 2 research ships to the Chilean coastline, researchers from the Department of Energy's EMSL are delving into the mysteries of vital parts of the southeastern Pacific Ocean's climate system. Because elements of this system are poorly understood and poorly represented in global climate models, gathering real-time, complementary data should improve the accuracy of the models and the resulting predictions. Specifically, the campaign focused on stratocumulus clouds, major contributors to temperature changes in the climate system over much of the eastern Pacific and Atlantic Oceans. Northern Chile was chosen for the campaign because of the easy access to the largest subtropical collection of persistent, low-lying stratocumulus clouds on the planet.

*Working in tight quarters aboard DOE's G-1 Gulfstream research aircraft, EMSL scientists gathered data on the particles responsible for forming clouds that play a major role in global climate.*

EMSL scientist M. Lizabeth Alexander, supported by Matt Newburn, used EMSL's proton transfer reaction mass spectrometer onboard DOE's G-1 Gulfstream to measure dimethylsulfide and related compounds from ocean biota; toluene, xylene, and acetonitrile from biomass burning; isoprene and terpenes from terrestrial plants; and polycyclic aromatic hydrocarbons from smelters and other combustion sources. The measurements from this instrument will help identify the sources of particles responsible for the formation and radiative properties of marine stratocumulus clouds.

In addition, EMSL scientist Alexander Laskin deployed and operated a dual column cloud condensation nuclei (CCN) counter and time-resolved particle sampler onboard the G-1 aircraft. The chemical composition of collected particles is being analyzed by an array of microscopy, micro-spectroscopy, and mass spectrometry techniques. The resulting data will be intensively correlated with *in situ* records of aerosol hygroscopic properties and CCN activity as well as meteorological records to understand exact sources, transport history, and atmospheric chemistry of the sampled particles.

The campaign is known as the Variability of the American Monsoon Systems Ocean-Cloud-Atmosphere-Land Study Regional Experiment and is part of a larger National Science Foundation funded study called VOCALS.

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