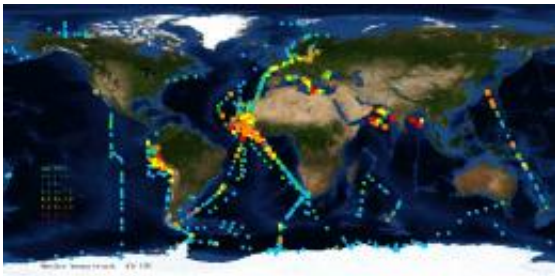


# Hand-held Aerosol Sensors Help Fill Crucial Data Gap Over Oceans

June 29 2009

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Scientists contributing to the Maritime Aerosol Network use portable instruments to measure aerosols levels during research cruises. The map below shows the trajectories of the 50 cruises conducted so far. Credit: NASA

(PhysOrg.com) -- Since NASA researchers began assembling the Aerosol Robotic Network (AERONET) in the 1990s, the worldwide network of ground-based aerosol sensors has grown to 400 sites across seven continents.

The trouble is that two-thirds of the planet is covered by ocean. And aerosols -- the tiny atmospheric particles that can have an outsized impact on the climate -- are just as likely to be found in the air above the oceans as they are over land.

Yet aerosols are scarcely measured over the oceans. Alexander Smirnov, an AERONET project scientist at NASA's Goddard Space Flight Center, Greenbelt, Md., hopes to change that. Smirnov is leading a new effort

called the Maritime Aerosol Network (MAN), which will send researchers with portable photometers on oceanographic research cruises. The hand-held devices can detect the presence of aerosols in air by measuring how light scatters as it strikes the particles.

Taking the measurements is relatively easy: Several times a day, a researcher stands on a ship's deck when the sun is fully visible, points the instrument at the sun, and pushes a button. The photometer performs a series of scans within a few seconds.

Finding "ships of opportunity" and volunteer scientists willing to take the measurements is not so easy. And transporting the photometers between the ships and Goddard for calibration can be a lengthy process.

Even so, Smirnov has arranged to have the have handheld photometers carried aboard more than 50 vessels—both commercial and research—from 12 countries since November 2006. Initial results show that data from the portable photometers correspond well with permanent AERONET stations on select islands.

The initial efforts have produced a tantalizing observation. "Aerosol concentrations over the oceans at the high latitudes are not as high as satellite measurements suggest they should be," said Smirnov. This could be a fluke, given the relatively small number of [ocean](#) measurements so far. Or it could mean, as researchers suspect, that the [satellite](#) instruments and measurement methodologies should be improved.

"We need to figure out why we're seeing this difference," said Smirnov. Unless scientists achieve greater confidence in aerosols measurements, predicting how climate in specific regions will respond to global temperature increases will remain difficult.

Source: NASA's Goddard Space Flight Center ([news](#) : [web](#))

Citation: Hand-held Aerosol Sensors Help Fill Crucial Data Gap Over Oceans (2009, June 29)  
retrieved 16 August 2024 from <https://phys.org/news/2009-06-hand-held-aerosol-sensors-crucial-gap.html>

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