

VOGNET: Continuous Monitoring of Particle Concentrations in “Vog” at Seven Hawaii Sites

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Condensation nuclei concentrations are being measured continuously at six Hawaii schools and in downtown Hilo by the Volcanic Fog Network (VOGNET), a cooperative program between the NOAA Mauna Loa Observatory (MLO) and public and private high schools on the Island of Hawaii. The prototype counter was designed at MLO in 2000. It is run by a laptop computer and uses common, inexpensive hardware and plumbing materials wherever possible. In 2001, students and teachers attended several weekend workshops where they constructed particle counters for their schools. Each counter cost \$500 in materials that were purchased from a grant provided by the Hawaii Electric Company. The instruments were calibrated at MLO, and the network began full operation in September 2002. Our data show how the aerosol component of volcanic pollution ("vog") is distributed in populated areas around the island as a function of time of day, elevation above sea level, and the prevailing wind direction. The database is available to researchers studying the health effects of exposure to volcanic pollution in Hawaii. Results from a 1-mo field experiment in July and August 2002 and the first 8 months of network operation are summarized (see, for example, Figure 1 for July 19, 2002, on the Kona coast). A working instrument is on display at the session.

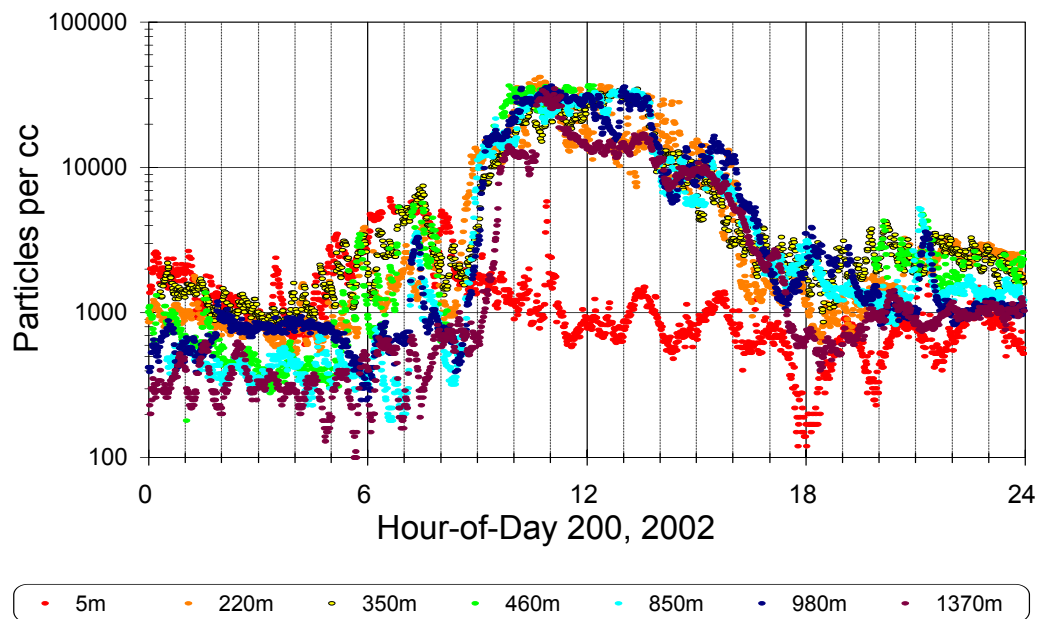


Figure 1. Condensation nuclei measured along a transect from sea level to 1370 meters on the Kona coast on July 19, 2002, during a 1-mo field experiment. Volcanic aerosols are present during the day at 220 meters and above, with relatively clean air persisting throughout the day at sea level. Downslope winds disperse the vog at night at all elevations. Oscillations in particle concentration with periods of about an hour are common. These data were edited to remove brief episodes of local contamination.