CMDL Baseline Observatory Operations

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The four CMDL atmospheric baseline observatories form the backbone of the CMDL global observation network with essentially continuous measurements of some atmospheric species beginning in 1957 at Mauna Loa, Hawaii and South Pole, Antarctica; and from 1973 onwards at the Barrow, Alaska and American Samoa facilities. Below are highlights of the past year of operations, recent scientific results and future plans.

- **Barrow:** This spring the large Arctic sunrise pulse of atmospheric mercury, first observed in the Canadian Arctic 4 years ago, was shown to be produced by the oxidation of reactive gaseous mercury (RGM) and not transported particulate mercury as previously thought. The highest concentrations of RGM observed on Earth were measured at Barrow in a joint EPA/DOE/NOAA project. An additional five cooperative programs were added to the Barrow operations this past year. Construction of a heated two-vehicle garage/storage building will be completed by this coming September and funding for two new staff houses has been approved for construction in 2003.

- **Mauna Loa:** The Springtime TRansport of Effluents from Asia to Mauna Loa (STREAM) study began in April and will run until June utilizing a suite of new instruments (CMDL and cooperative programs) to measure the annual springtime flow of dust and anthropogenic air pollution to Mauna Loa. These measurements complement the ACE-Asia studies in the Western Pacific. A new building will be constructed on site this summer to house the University of New Hampshire tropospheric wind profiling lidar for the GroundWinds program. The final plans and financing package for a solar energy installation at Mauna Loa was submitted to DOE. If funded, the array will supply all of the Mauna Loa power requirements during daylight hours. Future plans call for a new base operations facility to be built in Hilo.

- **Samoa:** The science programs at Samoa operated unchanged from previous years. The physical plant has been improved with the renovation of both staff houses, repair of the observatory roof, the addition of a new carport, and a new and much larger sampling tower. In May, a renovated solar power system will be completed that will provide up to 80% of the daily electricity requirements of the station. A successful Internet connection still eludes all acquisition efforts.

- **South Pole:** The past summer season activities in the Atmospheric Research Observatory were dominated by a large NSF-funded program measuring nitrogen chemistry. At one time an additional seven scientists were sharing CMDL facilities and power. There were frequent electrical overloads and instrument downtimes because of excess electrical demands in the austral summer. Balloonborne ozonesonde operations were fully successful over the complete year.

- **West Coast Baseline Station:** Seed funding for atmospheric measurements to begin selecting a site(s) for a U.S. West Coast baseline station facility were acquired for FY2001. This station is needed to monitor the trans-Pacific flow of anthropogenic effluents onto the U.S. west coast. The current Mauna Loa STREAM project and the upcoming summer 2002 Intercontinental Transport and Chemical Transformation of anthropogenic pollution (ITCT) program of NOAA WP-3 research flights in the Eastern Pacific (led by the NOAA Aeronomy Laboratory) will provide additional data for the site selection process.