

ME 1987-89

AIR AND WATER QUALITY MONITORING

Ozone (1982 - present)

Ozone levels in Acadia National Park are continuously monitored at McFarland Hill near Bar Harbor. Data reduction and quality assurance are provided by the State of Maine Department of Environmental Protection (DEP). Summer ozone levels frequently exceed State levels and have exceeded EPA maximum ozone attainment levels several times since ozone monitoring was begun.

Ambient Elemental Monitoring (1985 - present)

The University of California, Davis, provides Acadia with a sampler and dichotomous filter system for collection of particulates in the Park. Filters run for twenty-four-hour periods semi-weekly and are returned to UC Davis for analysis of elemental composition and mass. No data is available to Acadia at this time.

Visibility (1981 - present)

Through Air Resource Specialists, the National Park Service monitors visibility at many park/monument locations. A meteorological data system is integrated into this network, and data is relayed via satellite to Air Resource Specialists. Photographic data from an automated camera on Cadillac Mountain is used to evaluate visibility at Acadia. Annual summaries of meteorological and visibility information is provided to the National Park Service.

Improve Aerosol Sampling (1987 - present)

Bi-weekly sampling is conducted with the University of California, Davis, to analyze causes of visibility impairment. Analysis is made of mass, optical absorption, elemental composition, nitrates, sulfate and chloride ions, carbon mass, and fine particulate (<10 micron) mass.

Transmissometer (scheduled installation, 1987)

Visibility monitoring will be enhanced with the addition of a transmissometer to monitor visual range. A transmissometer is to be mounted on Cadillac Mountain, and a receiver will be installed at the McFarland Hill Ranger Station.

Airborne Particulates (1979 - present)

Particulate levels are regularly sampled for total suspended particulates (TSP) and fine particulates (less than 2.5 microns). From 1979 to 1983, the program was run by the EPA's Inhalable Particulate Network on an every sixth day sampling scheme. Since 1983 the program has run every third day, and analysis and quality assurance are provided by DEP. Acadia has typically had the lowest maximum peaks and annual mean concentration of TSP and fine particulates of sites sampled within the State of Maine.

Sulfates (1983 - present)

In conjunction with particulate sampling, TSP filters have been analyzed for sulfate content by the DEP. Because there are no EPA standards for sulfates and the accuracy of sampling methodology has not been confirmed, data has not been summarized by the DEP.

National Atmospheric Deposition Program (1980 - present)

Acadia is a host site for a sampler of the National Atmospheric Deposition Program (NADP). Weekly precipitation samples are collected and analyzed for pH and conductivity and then sent to the Central Analytical Laboratory in Illinois where more detailed chemical analysis is performed. Quality assurance is provided by the DEP and the Central Analytical Laboratory.

Marshall Brook Monitoring (1983 - present)

Conductivity and pH are monitored during the warmer months above and below the Worcester Landfill to detect major changes in water chemistry and to provide baseline data for long-term comparisons. Results of this monitoring have been used in summaries of landfill leachate by Soukup, Boyle, and others.

AIR AND WATER QUALITY RESEARCH

Evolutionary Effects of Ozone (1983 - 1984)

Collections of up to fifteen clones each of quaking aspen, red maple, black cherry and paper birch were propagated and exposed to controlled levels of ozone. Aspen from Acadia was scored intermediate in sensitivity, indicating some selection against sensitive genotypes has occurred. (Kornosky)

White Pine Biomonitoring Plots (1984 - 1986)

Twenty plots of white pine were permanently established and trees evaluated for injury from ozone. Significant injury was found. Other miscellaneous studies included population and community structure and foliar elements. Plots were reevaluated in subsequent summers. (Treshow, Sanchini)

White Pine Injury Phenology (1985 - 1986)

Time course of ozone injury development following significant ozone events and relationship to needle growth and retention. (Bennett, Foley)

White Pine Fumigation Study (1987)

Samples of injured and non-injured white pine trees were collected and grafted to rootstock and exposed to varying levels of ozone by the EPA's Corvallis, Oregon, lab. Results of this research are not yet available.

Impact of Leachate to Marshall Brook (1985 - 1986)

Chemical and biological analysis of Marshall Brook from sites above and below the Worcester Landfill were made to determine the impacts of leachate to the brook and the brackish estuary (Bass Harbor Marsh) below. Preliminary results indicate elevated levels of ammonia toxic to native trout and reduced invertebrate diversity below the leachate site. High phosphorous levels in the marsh were believed to be responsible for dense algal blooms and thought to have originated elsewhere. Impact of the landfill to the marsh is considered minimal. Threats of the leachate to public drinking water (Long Pond and local wells) remain a concern. (Boyle, Gibbs)