



# National Atmospheric Deposition Program/ National Trends Network

## Background

The National Atmospheric Deposition Program (NADP) is a cooperative effort among private, state, and federal organizations that provides the only long-term, nationwide record of the chemistry of U.S. precipitation. Known today as the NADP-National Trends Network (NTN), its main goal is enhancing the understanding of the causes and effects of acidic precipitation. The Long-Term Coastal Ecosystem Monitoring Program at Cape Cod National Seashore (CACO) has participated since 1981 and records are obtained through the continuous collection and analysis of precipitation samples from a 220 nationwide network. Long-term atmospheric changes happen gradually because of long-standing natural cycles and short-term variability. Analysis of the data obtained by NTN is the only way to verify whether the total deposition across the nation has been reduced as a result of the Clean Air Act.

## Atmospheric Deposition

Atmospheric deposition is the process whereby airborne particles and gases are deposited on the earth's surface. Specifically, acid rain is deposited material from the atmosphere that contains higher than normal amounts of sulfuric and nitric acids. These chemical constituents come from natural sources such as volcanoes, but primarily from industrial sources such as fossil fuel combustion. Sulfuric deposition in CACO has been greatly reduced of late, but it is still a major concern. It can lead to the acidification of freshwater kettle ponds, causing many beneficial microorganisms to disappear. Some of these organisms are involved in nutrient cycling and their removal may dramatically affect the ecological community. Atmospheric inputs of nitrogen is also a major cause of nutrient enrichment in aquatic ecosystems. Symptoms of eutrophication include algal blooms and declines in fish health, setting off dramatic changes in community structure and composition.

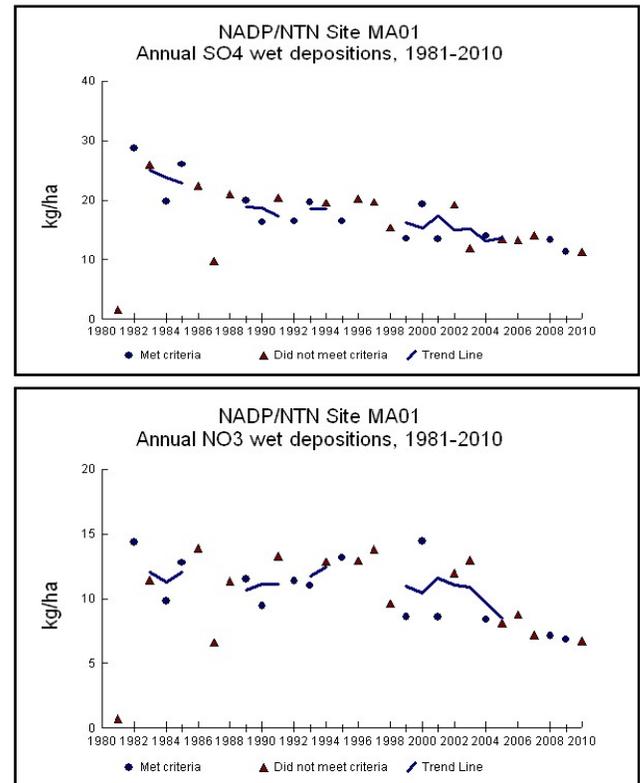


Figure 1. CACO's Annual Sulfate and Nitrate wet deposition in kg/ha from 1981-2010 indicates a three fold decrease in wet deposition since the early 1980's. More information at <http://nadp.sws.uiuc.edu>

## Management Applications

Changes in fossil fuel use have successfully lowered the emissions of sulfuric and nitric acids across the U.S. since the 1980s and CACO has seen positive significant reductions. The NADP is helping to importantly establish and clarify long-term acidic deposition trends to characterize the nation's chemical climate and allow for informed environmental decisions.

## Contact

**Krista Lee**  
Physical Scientist  
Cape Cod National Seashore  
99 Marconi Site Road  
Wellfleet, MA 02652

ph: 508-487-3262  
email: [Krista\\_Lee@nps.gov](mailto:Krista_Lee@nps.gov)

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