



Atmospheric Deposition & Impact in CUPN Parks

Importance / Issues

Key reasons for monitoring atmospheric deposition and impact on native acid-pH-sensitive plant species in Mammoth Cave National Park are that:

1. atmospheric acid-producing pollutants are priority anthropogenic threats to park natural resources across the U.S.A, with significant levels of impact occurring in the southeastern region
2. many native plant species (including species listed under the Endangered Species Act) are known to be acid-pH-sensitive, and could thus be good indicators of changes in impact levels
3. impact on acid-pH-sensitive plant species is specifically identified as a management objective on the park
4. comparable regional and national data-sets exist that will facilitate placing park-specific impacts into a larger resource-impact, plant community and ecosystem context. This protocol will be based largely upon adaptation of established atmospheric deposition-impact assessment, NOX/SOX monitoring, soil chemistry, and field plant community sampling methodologies, together with development of a plot sampling design.



National Trends Network Collector at MACA

Preliminary Monitoring Objectives

1. Determine the current NOX and SOX levels, and growing-season trend in these levels, on Mammoth Cave National Park.
2. Determine soil pH levels trends on atmospheric deposition impact monitoring sites on the park on a growing-season basis.
3. Estimate atmospheric-deposition-induced damage levels in selected acid-pH-sensitive native plant species on the park on an annual basis in selected native stands.
4. Estimate changes and rate-of-change in distribution and abundance of selected acid-pH-sensitive plant species on atmospheric deposition-impact monitoring sites on the park.

Possible Approach

Native stands of selected acid-pH-sensitive plant species would be identified within the NatureServe monitoring plot array established on the park. Soil pH and some other chemical parameters would be monitored on atmospheric deposition impact plots on the park, in conjunction with monitoring of visible damage to selected acid-pH-sensitive plant species on those plots. Damage assessment would be based upon adopted standard assessment and monitoring methods. Plant abundance and distribution in native stands would be monitored using standard community sampling methods. Standard methods for seed collection and viability assessment would be adopted as needed and with respect to monitored species.

Contact

Johnathan Jernigan
Cumberland Piedmont Network
P.O. Box 7
Mammoth Cave, KY 42259
(270) 758-2146
(270) 758-2633 fax