

## **Variation in atmospheric deposition along the Appalachian Trail**

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Total atmospheric deposition, including precipitation, dry particles and gases, and cloud, is highly variable in both space and time making assessment of its impact on ecosystems dependent upon understanding this spatial and temporal heterogeneity. To understand the spatial variability in atmospheric deposition and its ecosystem effects, a collaborative project among soil scientists, physiological ecologists, watershed scientists, modelers, and specialists in atmospheric deposition was initiated in 2010. We collected throughfall (TF), a measure of total deposition, at high and low elevations at five locations (Sugarloaf Mountain, ME; White Mountains, NH; Delaware Water Gap, NJ; Shenandoah, VA; and Coweeta, NC) along the Appalachian Trail during the summer of 2010 as part of the AT MegaTransect Project.

Based on previous work and modeling, we expected higher deposition with increasing elevation interacting with a general trend of higher deposition with decreasing latitude along the trail. Nitrogen (N) and sulfur (S) deposition generally increased with elevation, but the slope of this relationship varied across sites. N and S deposition were both highest at Delaware Water Gap, with Coweeta also having high N deposition but the lowest S deposition. Sugarloaf experienced the lowest N deposition but some of the highest S deposition at high elevation. Our collaborators have also sampled soil, vegetation, and stream water at these sites. We expect that the chemical and biological responsiveness of sites will depend upon the deposition load and the buffering capacity of the soils.