Undergraduate Internship Project #7 of 7 for FY13

Intern Alexey Shiklomanov’s project, co-sponsored by the DWRC and the UD’s Water Resources Agency was titled “Acid Neutralization of Stemflow in a Deciduous Forest: The Role of Edge Effects.” He was advised by Dr. Delphis Levia of the UD’s Department of Geography.

Abstract

Atmospheric deposition is an important pathway for moisture, nutrient, and pollutant exchange between the atmosphere and soils. However, atmospheric deposition can also alleviate acid inputs to the soil. Depositional fluxes have been found to vary substantially as a function of tree position relative to the forest edge. This study sought to: (1) develop an effective field observation strategy capable of detecting differences in ANC (acid neutralization capacity) in relation to forest edge and interior locations; and (2) measure and analyze the differential ANC of stemflow from trees located at a range of distances from the edge of the forested watershed. Such work would increase our knowledge of forest biogeochemical cycling, and specifically forests' vulnerability to soil acidification. Stemflow was collected from nineteen Liriodendron tulipifera L. (yellow poplar) trees from representative locations within an experimental watershed in northeastern Maryland. ANC was measured by potentiometric titration. Results indicate that edge trees had higher and more variable median stemflow ANC and pH than interior trees. On a tree-by-tree basis, trends were confounded by inter-individual variability, which merits further investigation.