

Shenandoah Watershed Study

The Shenandoah Watershed Study (SWAS), a combination research and monitoring program, was initiated in 1979 in the Deep Run Watershed, Shenandoah National Park (SNP). Since that time, other subcomponents of the study have been added. The Deep Run portion is the longest running record of acid deposition effects in the National Park System. The objectives of the overall project are twofold:

- 1) Evaluation and interpretation of biogeochemical cycling and acid deposition effects on watershed systems and streams in SNP, and
- 2) Baseline monitoring of streamwater chemistry and precipitation in SNP.

Recent Progress: The SWAS monitoring network has been maintained and expanded. Weekly streamwater samples are presently collected for analysis from 9 locations in 4 watersheds (North Fork of Dry Run, Deep Run, White Oak Run, and Madison Run). Quarterly streamwater samples are collected from 10 additional streams. The quantity and chemistry of precipitation is determined for one location (in the Deep Run/White Oak Run/Madison Run area) and continuous stream discharge measurements are obtained for two streams (White Oak Run and North Fork Dry Run). Field research underway during the year includes studies of both hydrologic and soil controls on streamwater chemistry. Extensive data analysis also is underway, including studies of temporal trends and elemental budgets for calibrated watersheds.

Significant Findings: SNP receives an acid deposition load estimated to be 10 times the preindustrial level. Stream and watershed systems in large areas of SNP are poorly buffered against effects of acid deposition. Acidification of streams in SNP is delayed by processes that retain sulfate in watershed soils. Acidification of one stream, Deep Run, has been documented.

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