

IMPACT OF BEDROCK GEOLOGY ON STREAM NITROGEN CONCENTRATIONS IN SHAWNEE NATIONAL FOREST WATERSHEDS

Roger D. Haschemeyer and Karl W.J. Williard[†]

Forested watersheds exhibit significant regional variability in stream nitrogen export. Bedrock geology has been identified as an important factor that can help determine stream nitrate concentrations through its control on soil fertility in unglaciated forested watersheds in the mid-Appalachian region of the United States. The objective of our study was to examine whether stream nitrogen variability was related to differences in bedrock geology in the unglaciated watersheds of the Shawnee National Forest. Twenty-four watersheds with 100% forest land and no recent disturbances were included in the study. Twelve of the watersheds contain limestone bedrock and the other twelve watersheds have sandstone bedrock. We hypothesize that the limestone watersheds will have greater stream nitrogen concentrations than the sandstone watersheds due to greater soil fertility and enhanced soil nitrogen cycling. Atmospheric nitrogen deposition rates are expected to be similar among the study watersheds given the relatively small geographical area of the Shawnee National Forest. Beginning in May 2003 and continuing for one year, stream samples will be collected monthly in each watershed at baseflow conditions. The samples will be analyzed for dissolved nitrate, ammonium, organic N, pH, and specific conductivity in the Forestry Laboratory of Watershed research (FLOW) at Southern Illinois University Carbondale. Overstory vegetation will be assessed also on each watershed.

[†]Roger D. Haschemeyer, Department of Forestry, Southern Illinois University Carbondale, 1205 Lincoln Drive, Carbondale, IL 62901-4411 Phone: 618-453-7479 Fax: 618-453-7475 Email: rhasch@hotmail.com