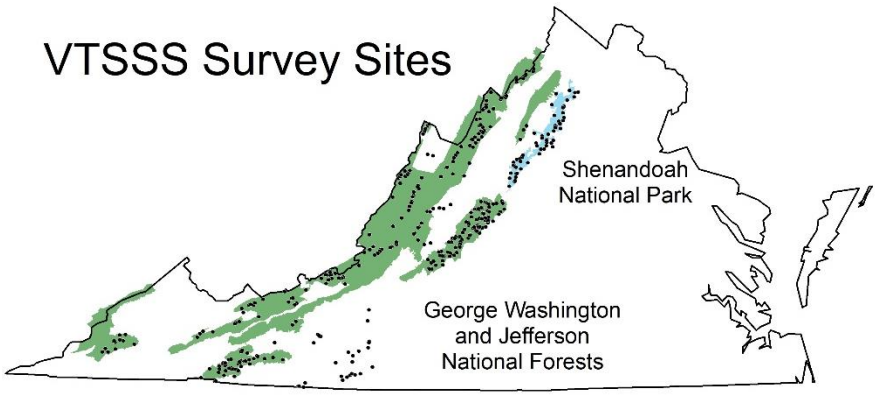
Virginia Trout Stream Sensitivity Study

Planning for a fourth regional survey in 2020

The Virginia Trout Stream Sensitivity Study (VTSSS) is designed to track the effects of acidic deposition and other environmental factors that determine water quality and related ecological conditions in Virginia's native trout streams. The VTSSS began in the spring of 1987 when water samples were collected from 367 (about 80%) of the mountain headwater streams in Virginia that support reproducing brook trout to assess acidification status and habitat suitability. Stream chemical analysis revealed a gradient in ANC, sulfate, and pH, ranging from suitable to chronically acidic. Subsequent to dramatic reductions in acid deposition resulting from the Clean Air Act Amendments of 1990, a second and third survey of those streams was conducted in the spring of 2000 and 2010, and revealed improvements in habitat suitability in some streams (% non-acidic increased from 60 to 75%). We are now proposing a fourth survey to be conducted in the spring of 2020 to determine if stream recovery from acid deposition has continued and to what extent, and where trout habitat suitability has returned.



Locations of native brook trout streams sampled for water quality in 1987, 2000, and 2010. A fourth survey is scheduled for the spring of 2020.

The VTSSS program has proven critical for development and implementation of public policies that will determine the future of native brook trout streams in western Virginia and the surrounding mountain region. The need for further reductions in acidic emissions, for example, was substantiated by the 2017 Acid Rain Program Report released by EPA in late 2018. Dramatic emission reductions have been followed by recovery from acidification in sensitive lakes and streams in the northeast, but results in western Virginia brook trout streams have been mixed. This finding is based on trends in surface water composition for the 26-year period following passage of acid rain controls in 1990, and is consistent with a 2011 National Acid Precipitation Assessment Program Report to Congress which flagged continuing stream acidification in the area that includes western Virginia. For both reports, EPA relied on the VTSSS program as its primary source of information on stream acidification and recovery in the southern Appalachian region.

Current federal and state regulations along with economic factors promise additional reductions in both the sulfur and nitrogen emissions that contribute to acidic deposition. Emissions will still exceed natural levels, however, and a number of assessments and model projections suggest that even with substantial reductions in future acidic deposition, recovery of southern and central Appalachian streams will be limited by soil damage associated with past acidic deposition, particularly for the most sensitive ones. Although it remains to be seen if acidification impacts to Virginia's native trout streams can be consistently reversed, it is clear that recovery will be less certain if we lose the capacity to evaluate the effectiveness of emission control programs. The VTSSS program provides that critical capacity. We are actively seeking resources to resurvey the larger population of native trout streams in the mountains of Virginia in 2020.

If you are interested in donating funds to the Virginia Trout Stream Sensitivity Study 2020 survey, please go to the following website, https://giving.as.virginia.edu/ . Donors can then use the "Give to" drop-down menu to select "Environmental Sciences Department" and in the notes field in a subsequent page, type "Trout Stream Sensitivity Survey." Funds will primarily be used to purchase laboratory supplies for sample analysis.

The VTSSS program is a cooperative effort involving the Department of Environmental Sciences at the University of Virginia, Trout Unlimited, the National Park Service, the U.S. Environmental Protection Agency, the USDA Forest Service, and the Virginia Department of Game and Inland Fisheries. The VTSSS program is coordinated with the Shenandoah Watershed Study (SWAS). For more about the VTSSS and SWAS programs, see http://swas.evsc.virginia.edu or contact Ami Riscassi at arl8m@virginia.edu.