

Probabilistic Assessment of Wadeable Streams in the Southeastern U.S.

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Abstract

The Southeastern Wadeable Streams R-EMAP project applied probability sampling and analysis to a regional study of wadeable streams. The goal of the project was to determine, at +10% precision with 90% accuracy, the percent of U.S. EPA Region 4 stream miles that were subnominal in terms of habitat, ecological integrity, and trophic state. More than 200 random and 30 reference stations were sampled over four years. Interim results for several parameters are presented, including water column physico-chemistry and nutrients, RBP habitat score, benthic macroinvertebrate indices, and whole-body total mercury in forage fish. After three years the median concentration of mercury was 0.088 mg/kg (wet weight), with 43 + 13 % of Regional stream miles having a concentration that poses an ecological risk to predators (>0.100 mg/kg). Higher values occurred in the Southeastern Plains compared to other ecoregions. Methylation rates are probably higher in the more anaerobic sediments of warm, slowly flowing coastal plain streams. Multi-scale pilot studies are underway to explore the feasibility of using remote sensing and atmospheric measurements to relate watershed, riparian, and channel conditions to in-stream metrics.

Keywords: mercury, fish, regional, bio-assessment

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