

Presented at the SOCIETY OF ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY
(SETAC) 22nd Annual Meeting, November 11-15, 2001, Baltimore, Maryland

Implications of Nutrient Total Maximum Daily Load (TMDL) Criteria for Little Topashaw Creek. Lizotte, R.E.*, Moore, M.T., C.M. Cooper, USDA-ARS National Sedimentation Laboratory, Oxford, MS. Proposed USEPA nutrient TMDL criteria for ecoregion IX (southeastern temperate forested plains and hills) were compared with measured nutrient concentrations in Little Topashaw Creek, a north Mississippi hill land stream, to evaluate how appropriate currently proposed guidelines are for this region. Water quality data were collected monthly for 2-7 consecutive days during low stream flow conditions and for 24 consecutive hours during storm events. Parameters measured included total PO₄, NH₄-N, NO₃-N, NO₂-N, total kjeldahl-N, total nitrogen and chlorophyll *a*. Little Topashaw Creek total PO₄, total nitrogen and chlorophyll *a* concentrations often exceeded (>50% of samples) proposed nutrient criteria with concentrations 2-3 fold or greater in conditions of low stream flow and commonly exceeded (>80% of samples) nutrient criteria during storm events with correspondingly increased concentrations. Ammonia-N, NO₃-N and NO₂-N had few exceedances (<10% of samples) occurring primarily during storm events. Although increased nutrient concentrations are associated with run-off during storm events, north Mississippi hill land streams, such as Little Topashaw Creek, would frequently not meet proposed USEPA nutrient TMDL criteria even during low stream flow conditions. The inability of Little Topashaw Creek to meet currently proposed nutrient criteria can be attributed to specific regional characteristics such as soil phosphorus concentrations and densities of wildlife and domesticated livestock. Inclusion of these specific regional characteristics in determining nutrient TMDLs would reduce the possibility of exceedance in north Mississippi hill land streams without necessarily compromising water quality.