

PUBLICALLY ACCESSIBLE DECISION SUPPORT SYSTEM OF THE SPATIALLY REFERENCED REGRESSIONS ON WATERSHED ATTRIBUTES (SPARROW) MODEL AND MODEL ENHANCEMENTS IN SOUTH CAROLINA

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The U.S. Geological Survey (USGS) National Water Quality Assessment program has developed a web-based decision support system (DSS) to provide free public access to the steady-state SPATIALLY REFERENCED REGRESSIONS ON WATERSHED attributes (SPARROW) model simulation results on nutrient conditions in streams and rivers and to offer scenario testing capabilities for research and water-quality planning. Access to the decision support system is through a graphical user interface available online at <http://cida.usgs.gov/sparrow>. Nationally, the SPARROW models are based on the modified digital versions of the 1:500,000-scale River Reach File and 1:100,000-scale National Hydrography Dataset stream networks.

For South Carolina, the DSS has total nitrogen and total phosphorus models for the South Atlantic-Gulf and Tennessee Region based on the Enhanced River Reach File 2.0. The system can be used to estimate nutrient conditions in unmonitored streams in South Carolina and to produce estimates of yield, flow-weighted concentration, or load of nutrients in water under various land-use conditions, changes, or resource management scenarios. This model divides larger river basins into multiple stream catchments and models nutrient contributions by source inputs and land use within each of those catchments. The model information, reported by stream reach and catchment, provides contrasting views of the spatial patterns of nutrient source contributions, including those from urban (wastewater effluent and diffuse runoff from developed land), agricultural (farm fertilizers and animal manure), and specific background sources (atmospheric nitrogen deposition, soil phosphorus, forest nitrogen fixation, and channel erosion). However, the large scale and static nature of the model (modeled only for the 2002 water year) have produced some limitations on the application of the decision support system on the state level.

To address those limitations, the USGS is working cooperatively with the Resources For the Future program to adapt the steady-state model for South Carolina to a dynamic model that will simulate seasonal-average loads, yields, and concentrations during the period 2001-2003. Temperature and an Enhanced Vegetation Index from Moderate Resolution Imaging Spectroradiometer (MODIS), a National Aeronautics and Space Administration Terra-satellite-borne sensor, will be used as input to the dynamic model to characterize seasonal uptake and release of nitrogen during land-to-water transport.

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Citation for proceedings: Stringer, Christina E.; Krauss, Ken W.; Latimer, James S., eds. 2016. Headwaters to estuaries: advances in watershed science and management—Proceedings of the Fifth Interagency Conference on Research in the Watersheds. March 2-5, 2015, North Charleston, South Carolina. e-Gen. Tech. Rep. SRS-211. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 302 p.