**Science & Technical Advisory Committee**
**Issue Paper 3, April 2008**
**Management Effectiveness and Efficiency:**
**Assessment of Current Restoration Investments in the APNEP Region: BMP Implementation and Effectiveness**

**Position:** The STAC encourages APNEP to organize an interagency committee to facilitate the adoption and implementation of a standard protocol for uniform, objective assessments of effectiveness of best management practices (BMPs). BMPs are implemented to protect water quality in the Albemarle-Pamlico Estuarine System, and are determined primarily by observed changes in basin water quality in addition to existing field scale studies of BMP effectiveness.

**Supporting Statement:** The Clean Water Act (CWA, Federal Water Pollution Control Act of 1972) directs the states to protect water resources through establishment of effluent standards, or limits, on point sources, primarily under section 303, and on nonpoint sources (NPS), under section 208, to ensure the total maximum daily load is such that the intended uses of the water are not impaired. Although the CWA has been very successful at reducing point source pollutants, it has been more difficult to control pollutants derived from nonpoint sources (Ribaudo and Woo 1991; Knopman and Smith 1993). Nonpoint sources from agricultural and urban areas contribute most of the transported sediment and nutrients that cause water quality problems that affect aquatic life (U.S. Environmental Protection Agency 2002).

BMPs have been used to reduce nonpoint-source contaminants from agricultural and urban land uses. These BMPs represent significant commitments of public time and money. Effectiveness of BMPs is most often assessed at the field scale. Unfortunately, although BMPs have been used extensively (the use of riparian buffers to control NPS pollution is one example), their cumulative effectiveness is difficult to assess because of the natural variability in many environmental settings, the variety of pollution sources in a watershed, the use of different assessment methodologies, and the expense to conduct assessment studies. Although BMPs have been demonstrated through individual field studies to be effective at individual sites (http://www.epa.gov/owow/nps/Success319/), there is currently no organized assessment to demonstrate collective water quality improvement through the use of BMPs at the watershed scale (at least at the scale of principle tributary streams of major rivers in the Albemarle-Pamlico region). There is a need to establish a consistent, scientifically defensible method of evaluating BMP effectiveness at watershed scales through water-quality trend determinations (see Alexander, R.B. and R.A. Smith 2006), with technical oversight and evaluation conducted by neutral and disinterested parties, in order to document effectiveness of BMPs through observable water-quality improvements and to ensure reliability and credibility of the assessments to the public and to environmental managers. Sources of funding, standard methods of data collection, analysis to achieve standardized objectives, quality assurance, and dissemination of results would be determined by an interagency committee composed of research scientists from agencies such as North Carolina Department of Environment and Natural Resources, US EPA, USGS, and USDA.

**References**

Alexander, R.B. and R.A. Smith. 2006. Trends in the nutrient enrichment of U.S. rivers during the late 20th century and their relation to changes in probable stream trophic conditions. *Limnol. Oceanogr*. 51:639–654.

Knopman, D.S. and R.A. Smith. 1993. Twenty years of the Clean Water Act—Has U.S. water quality improved?: Environment 35(1):16-41.

Ribaudo, M. and D. Woo. 1991. "Summary of State Water Quality Law as Affecting Agriculture," Agricultural Resources: Cropland, Water, and Conservation. AR-23. U.S. Dept. Agr., Econ. Res. Serv., Sept. pp. 50-54.

U.S. Environmental Protection Agency. 2002. National Water Quality Inventory: Report to Congress. EPA 841-R-02-001.