

Surroundings



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Watershed Study Models: Reaching goals with more accuracy and efficiency



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The main objective of the Clean Water Act (33 U.S.C.A. 1251) is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." In order to achieve these far-reaching objectives, the Clean Water Act includes a long list of goals and responsibilities for the United States Environmental Protection Agency (USEPA), the Administration in office, and the individual states. Many of these goals, such as "the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985," now seem more difficult, but there are many more reachable goals within the Clean Water Act that current government agencies, administrations, environmental groups, and others can continue to work toward.



A typical site in New Jersey that watershed assessment protocol would identify for restoration.

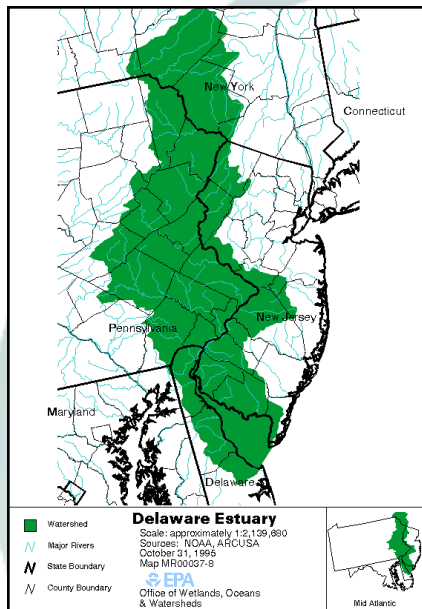
Two of these goals, and one additional mandate, lend themselves quite well to the use of new protocols for watershed assessment and restoration that integrate new technologies with the most up-to-date watershed science. These goals are as follows: **1)** Programs will be developed for the control of nonpoint sources of pollution; **2)** Apply available manpower and funds as a means to prevent needless duplication and unnecessary delays at all levels of government; and **3)** Federal agencies shall cooperate with state and local agencies to develop comprehensive solutions to prevent, reduce, and eliminate pollution in concert with programs for managing water resources.

A new protocol for meeting the goals of the Clean Water Act is now being developed using computer models for watershed management developed by the USEPA through various partnerships. This protocol seeks to integrate landscape change and assessment models and nonpoint source pollution control and stormwater management models with accepted field assessment methodologies for stream and wetland monitoring. The ultimate goals of this process are to: **1)** Accurately and efficiently model and field assess watersheds for nonpoint source pollution impairment issues; **2)** Develop a database of sites where restoration will have the greatest impact on water quality; and **3)** Work to seek funding for the restoration of these sites.

*Linking Environmental Issues to
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For purposes of watershed management, it is important to use macro-level models that are user-friendly, customizable, and efficient. Since most watershed groups and managers are neither trained in using various models, nor do they have the time to do detailed analysis of model outputs, models must be relatively quick, easy to use, and designed to be used with the most current Geographic Information System (GIS) data for a given study area. Models using GIS data allow the user to easily see spatial trends in landscape change and pollutant loads for a given study area, allowing the user to rank sub-basins by level of nonpoint source pollution impairment.



After sub-basins are ranked based on relative impairment, fieldwork can be completed using stream rapid assessment protocols, digital imagery, and GPS mapping. The goal of this fieldwork is to locate reaches of streams that allow for, cause, or are the most susceptible to impairment. Once the assessments are conducted, all of the data (i.e., location, mapping, field assessment notes, pictures, etc.) for a given reach can be entered into a database to be tied to a potential funding source.

Anyone interested in watershed restoration can then apply a database to the identification of areas that suffer the greatest impairment. Thus, the user (e.g., a state agency or watershed group) can responsibly and efficiently complete a restoration project that will have the greatest positive impact on water quality within a given study area.

A.D. Marble & Company, in partnership with the Delaware Valley Regional Planning Commission (DVRPC), currently is working to develop this methodology for implementation within the Delaware River Basin in Pennsylvania and New Jersey. Historically, these two states have taken the lead in funding critical watershed restoration projects. Pennsylvania's Growing Greener and Rivers Programs are very well funded, while New Jersey's 319 Program completes many restoration projects every year. The methodology described above will serve to streamline this process and direct groups to restoration projects that will improve water quality in their watersheds.

The Delaware River Basin is one example of a watershed where this protocol can be applied at the regional and local level (USEPA website: <http://www.epa.gov/owow/estuaries/sheds/de.gif>).

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