

Achievement

College of Agriculture and Life Sciences

Models that help Manage Water Quality

The way land is managed can contribute to pollution of surface and groundwater, particularly where nutrients such as nitrogen are concerned. Excessive nutrients in surface waters can lead to algae blooms and fish kills, while excessive nutrients in groundwater can be a health hazard. But how do we assess land management practices? How do we determine the impact of particular land uses or management practices during unusually wet periods or particularly dry periods? And how do we assess land use and management across a watershed? Until recently, such assessment was difficult. Now, however, a North Carolina State University research team led by Dr. Wayne Skaggs, William Neal Reynolds professor and distinguished university professor, has developed computer models capable of analyzing the hydraulics, hydrology and nitrogen loading of watersheds. Using these models, researchers can run long-term (30 to 50 years) simulations that show how land use and management practices in a particular watershed are likely to affect water quality. Such simulations may also be run using a variety of “what if” land use and management scenarios.

The computer models developed in the College of Agriculture and Life Sciences at NC State may be used to make watershed maps showing field by field how much nitrogen reaches a watershed outlet. In addition, these maps show how much nitrogen each field may contribute as a result of different weather patterns likely to occur over a 30- to 50-year period. With the aid of such maps, land managers can make informed decisions about the location of Best Management Practices, agricultural practices designed to protect water quality, and restoration projects within a watershed. The computer models developed at NC State are tools that may be used by policy makers and land managers to more effectively protect North Carolina’s environment.



A team led by Dr. Wayne Skaggs is developing computer models that may be used to help protect North Carolina’s environment.

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