



Virginia Tech

# TMDL DEVELOPMENT AND EDUCATION PROGRAM

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BIOLOGICAL SYSTEMS ENGINEERING



Virginia Cooperative Extension  
Knowledge For The Commonwealth

## BACKGROUND

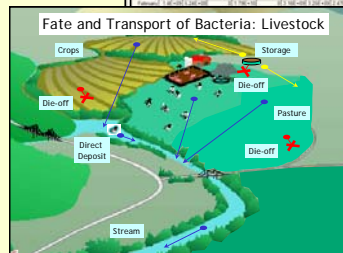
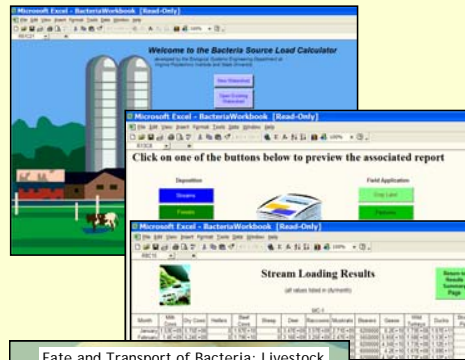
Water bodies that violate state water quality standards are "impaired." The Clean Water Act requires pollutant-specific total maximum daily load (TMDL) plans be developed for impaired water bodies. Developing a TMDL involves a study that 1. identifies the sources of the pollutants causing water quality impairments, 2. quantifies the pollutant contribution from each source, or source category in the case of nonpoint source pollution (NPS), and 3. determines the pollutant reduction from each source required to meet applicable state water quality standards. The TMDL defines the total pollutant loading a water body can receive and still meet applicable water quality standards.

## OBJECTIVES

- ◆ Improve the science and procedures used to develop, evaluate, and implement TMDLs
- ◆ Provide training in the development and implementation of accurate, effective, achievable TMDLs
- ◆ Facilitate participation in the TMDL process by increasing awareness and understanding of NPS pollution and water quality issues

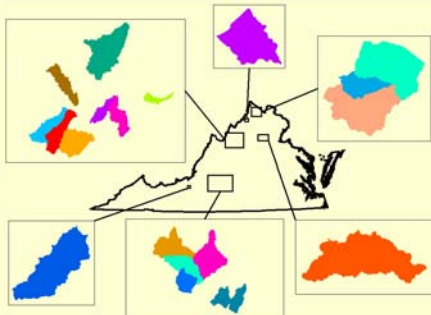
## OUTREACH AND EDUCATION

- ◆ Conducted Continuing Professional Development workshops for scientists and practicing engineers
- ◆ Conducted hands-on modeling workshops for state agency TMDL program managers
- ◆ Developed graduate level TMDL course
- ◆ Developed software to facilitate data development for modeling studies
- ◆ Conducted more than 60 watershed public meetings associated with TMDLs development
- ◆ Developed two TMDL courses for summer high school scholar internship program
- ◆ Delivered TMDL-specific presentations to Soil and Water Conservation Districts
- ◆ Mentored consulting firms
- ◆ Developed TMDL-specific extension publications



## TMDL DEVELOPMENT EXPERIENCE

- ◆ Developed 25 TMDLs (bacteria and benthic)
- ◆ Active on state agency Advisory Boards
- ◆ Developed "Standards of Practice" for TMDL development that were adopted by the state



Watershed Locations

## RESEARCH

- ◆ Investigate bacteria fate and transport
- ◆ Examine the relative strengths of different models
- ◆ Develop objective criteria that can be used to evaluate the quality of TMDL plans
- ◆ Presented and published more than a dozen papers at professional meetings and in proceedings



## FUTURE



The Center is committed to improving the scientific basis and professional expertise used to develop, implement, and evaluate TMDLs in watersheds impaired predominantly by nonpoint source pollution.