STATE WATER PLAN ASSISTANCE:
A Screening Tool for Assessing
Pennsylvania Water Resources

Cooperator:
Pennsylvania Department of Environmental Protection
Pennsylvania Water Resources Planning Act (Act 220)

- Pennsylvania Department of Environmental Protection (PaDEP) is the lead agency

- Tasks include:
  - Update State Water Plan within 5 years and updates every 5 years thereafter
    - Assess surface and groundwater resources
    - Assess existing and projected water use
    - Identify critical water planning areas
    - Create critical area resource plans
Screening Tool Objectives

- Develop a screening tool to evaluate statewide surface- and ground-water resources on a watershed basis.
- Provide PaDEP managers with the interactive capability to generate and evaluate what-if scenarios of planned or requested water uses.
Screening Tool Capabilities

The Screening Tool helps to answer:

- How much surface and ground water do we have?
- How much do we use?
- What is the difference between what we have and what we use?
- How much water is available?
- Where is water use exceeding availability?
- Where is water use getting close to availability?
Screening Tool Capabilities

Surface Water “Availability”

- Determined by streamflow statistics and net water use within a basin
  - Simplified water budget:
    
    \[
    \text{Surface water availability} = \text{streamflow statistic} - \text{withdrawals} + \text{discharges}
    \]

- 7-Day, 10-Year low-flow statistic determined from regional regression equations
Screening Tool Development

3 Major Components:

- Hydrologic, statistical, and water-use data
  - Development of regression equations
  - Compilation of water use data

- Spatial data elements for geographic analysis
  - GIS data preparation

- User system to access the water-planning information
  - Desktop application
  - Web application
Screening Tool Development: Water-Use Data

- From PaDEP database
- Includes all registered surface-water and ground-water withdrawals and returns
- Categories include public supply, industrial, mining, irrigation, and wastewater treatment facilities
Screening Tool Development: Spatial Data Analysis

GIS data preparation

- Started from 30-meter national elevation dataset
- Through GIS processing, developed 10-meter hydrologically enforced digital elevation model

10-meter elevation grid

Each point has x, y, and z data values:
- x = longitude
- y = latitude
- z = elevation
Screening Tool Development: User System

- Provide flow statistics, water-use totals, and water availability at pour points
- Approximate statewide total of 10,000+ pour points
- Pour Points will be colored to indicate water availability
- PaDEP managers will be able to edit water use at pour points

Surface-Water Availability 7Q10 Statistic
- Normal
- Potentially Stressed
- Stressed
Screening Tool Development: User System

Show Basin tool

Edit Pour Point tool

Save and Recall Scenarios

Water use totals are taken from the WUDS data only. They do not take into account any edits made in the Pour Points.
STATE WATER PLAN ASSISTANCE: A Screening Tool for Assessing Pennsylvania Water Resources

Cooperator:
Pennsylvania Department of Environmental Protection