Integrating Monitoring Data into Water Resource Management Decisions
Susquehanna River Basin

The Basin
- 27,510-square-mile watershed
- Comprises 43 percent of the Chesapeake Bay watershed
- 4.2 million population
- 32,000+ miles of waterways

The Susquehanna River
- 444 miles, largest tributary to the Chesapeake Bay
Susquehanna River Basin Commission

- Federal-interstate compact commission established by the federal government (USACE) and the states of New York, Pennsylvania, and Maryland.

- Responsible for managing the basin’s water resources.

- Regulatory authority for water withdrawals, diversions, and consumptive use

- Water quality monitoring and coordination
Types of Projects Regulated
Water Withdrawal Review

- Environmental Screening
  - Classification
  - Natural Diversity Inventory
  - Wetlands
  - Water Quality
- Aquatic Resource Survey
- Passby Evaluation
- Cumulative Impact Evaluation
- Aquatic Invasive Species
- Intake Design & Metering Plan
- Compliance Activities
Environmental Screenings

- Surface and Groundwater Withdrawals
- Stream Classifications
- 303(d) List or PWL Status
- Adjacent Wetlands
- Wild/Scenic Rivers
- Natural Diversity Inventory
- Aquatic Nuisance Species
Aquatic Resource Surveys

- No data available
- Obsolete information
- Special protection stream
- Protocols

- Background data for enforcement
- Correct protection level
- Pass-by decisions - possible stream reclassification

Susquehanna River Basin Commission
Annual Hydrograph - Larrys Creek

- Full Range of Flow (P0 - P100) (cfs)
- Approved Withdrawal (cfs)
- Daily Median Flow (P50) (cfs)
- 7-Day, 10-Year Low Flow (7Q10) (cfs)
- 20% of Average Daily Flow (20% ADF) (cfs)

- 20% ADF = 10.55 cfs
- 7Q10 = 1.45 cfs
- Withdrawal = 0.13 cfs
Annual Hydrograph - Larrys Creek

25% ADF = 13.19 cfs
20% ADF = 10.55 cfs
7Q10 = 1.45 cfs
Withdrawal = 0.13 cfs

Susquehanna River Basin Commission
The Commission is moving toward a more environmentally protective management system based on ecological flows.
Ecological Flow Management

Cold Water Instream Flow Study PA, MD, USACE, USGS, PFBC

TNC Instream Flow Project in PA

Environmental Flow Study USACE & TNC
Major flow types and flow needs of species and habitats in the Susquehanna River

- **Flow types**:
  - High Flow Events
  - Seasonal Flows
  - Low Flows

- **Flow needs**:
  - High Flow-related needs
  - Seasonal Flow needs
  - Low Flow-related needs

- **Seasons**:
  - SPRING
    - Channel maintenance and floodplain connectivity
  - WINTER
    - American Shad spawning migration, egg and larval development
    - Overwinter habitat for Fish and Insects
  - FALL
    - Migratory fish outmigration
  - SUMMER
    - Vegetation growth
    - Egg, larval, and juvenile growth of fishes and amphibians
    - Mussel spawning
    - Water quality maintenance

Flow (measured in cubic feet per second, cfs)
Warm Water IFIM Study

- 41 mgd withdrawal
- Up to 31 mgd CU
- Investigating potential effects of consumptive use on aquatic biota and fish habitat related to a water withdrawal for Bell Bend Nuclear Power Plant
- Investigating life stages and seasonal effects

Figure 1-2.
Macrohabitat types classified in the study area during an initial field trip in early September 2009.
Whitney Point Project Objectives

• Maintaining Whitney Point Reservoir at a year-round pool level - 8,500 acre-feet of total storage will be available to augment downstream flows

• Monitor annually and during trigger low flow conditions to document the benefits of additional flow to the system.
Low-flow Monitoring Plan

- Sentinel station system
- Pilot project in the Juniata Subbasin
- Yearly baseflow data collection
- Drought conditions, when occur
- Possible addition of subset of smaller streams, based on outcomes of pilot study
Sentinel Stations

- Increased time and expense associated with monitoring larger streams
- Located near USGS stream gaging stations
- Targeted riffle sections
- Macroinvertebrate sampling
- Periphyton data
- Water quality data
- Freshwater native mussels
- Photographs
Pilot Study

- 25 stations
- Discharge measurement
- Biotic & abiotic features
- Yearly report on baseflow conditions
- More extensive reporting during low flow years
- Management decisions to mitigate low flow effects
- Management decisions regarding pass-by flows and surface water withdrawals
Remote Water Quality Monitoring Network

Station Locations
- Increased activities associated with natural gas development
- Sensitivity of headwater areas
- Public concerns
- Site considerations

Parameters of interest
- Conductance
- Temperature, pH, dissolved oxygen, turbidity, and depth
- Supplemental data

Website Interface
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