

INDICATOR 5

SEDIMENT AND NUTRIENTS



OVERVIEW

About 4,200 stream miles in the Susquehanna River Basin are impacted by nutrients and/or sediment, with a large number of impacts occurring in the Lower Susquehanna region. Sediment and nutrient impairment encompasses a variety of aquatic impacts, including decreased habitat availability, increased aquatic vegetation production, and depressed dissolved oxygen levels. High nitrate levels also can preclude use of water for human consumption and can lead to poor reproduction in farm animals.

The sources of sediment and nutrients in the basin are as varied as they are widespread, ranging from

Overarching Issue

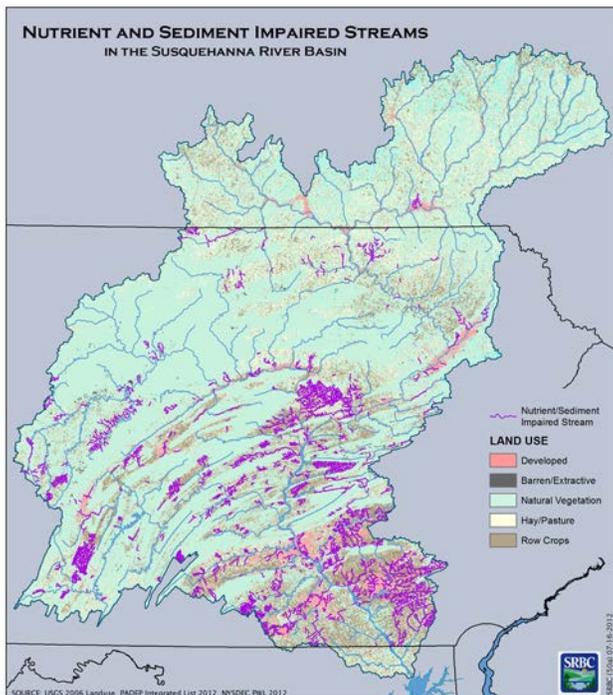
Nutrients and sediment are two of the largest contributors to stream impairment in the Susquehanna River Basin and are extremely widespread. Sediment and nutrients negatively impact aquatic life uses and can preclude water use for human consumption. Excess nutrients in the Chesapeake Bay can lead to algal blooms and eventually oxygen depletion when the algae die and decompose – affecting aquatic life. Sediment also is a problem in the Bay, as it reduces water clarity for plant life and transports nutrients that may be bound to the sediment.

INDICATOR CRITERIA

Criteria	Assessment Period		
	2009 - 2010	2011 - 2012	
Number of stream miles impaired by sediment and/or nutrients	4,135	4,211 *	
Number of local watershed plans (TMDLs) completed to address sediment and nutrients	106	136	
State Watershed Implementation Plan (WIP) progress - % reduction needed to meet overall pollution targets	25%	21%	
Percent reductions shown to date in long-term flow-adjusted concentrations, as monitored by SRBC			
	Nitrogen	30%	33%
	Phosphorus	33%	41%
	Sediment	41%	46%

* Increases in stream miles data from 2010 to 2012 largely reflect refinements to states' impaired-waters categorization process.

Data Sources: SRBC SNAP data, NY/PA/MD WIP and TMDL tracking data, NY/PA/MD stream impairment data



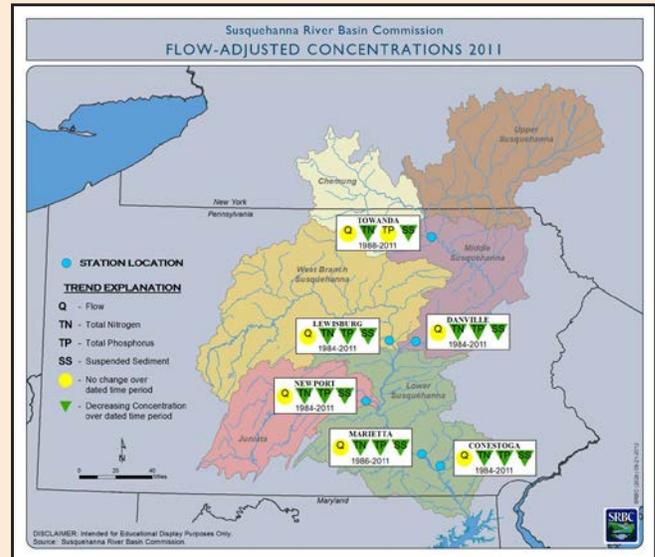
atmospheric deposition, to fertilizer treatments on suburban lawns, to impacts related to animal grazing. Many best management plans exist to reduce the amount of nutrients and sediment entering stream systems, including planting healthy riparian areas, fencing farm animals from streams, installing stormwater wetlands or bioretention features and applying proper construction techniques.



MONITORING AND ADDRESSING THE PROBLEM

MONITORING — SEDIMENT AND NUTRIENTS IN THE BASIN

In 1985, SRBC along with the U.S. Geological Survey, the Pennsylvania Department of Environmental Protection (PADEP) and the U.S. Environmental Protection Agency (USEPA) began an intensive study of nutrient and sediment transport in the Susquehanna River Basin. Funding for the program was provided by grants from the PADEP and the USEPA Chesapeake Bay Program Office. The long-term focus of the project was to quantify the amount of nutrients and suspended sediment transported in the basin and determine changes in flow-adjusted concentration trends at twelve sites. Several modifications were made to the network including reducing the original twelve sites to six long-term sites, then adding 13 sites in 2004, four sites in 2005 and four sites in 2012. The current network consists of 27 sites throughout the Susquehanna River Basin varying in watershed size and land use.



Collecting data at stations on the mainstem Susquehanna River and major tributaries is necessary to characterize nutrient and suspended sediment loads and trends, shown above, and to confirm the Chesapeake Bay Program watershed model load allocations. These analyses provide the basis for refining the model for tracking the necessary reductions needed to restore local waters and the Chesapeake Bay.

ADDRESSING — TOTAL MAXIMUM DAILY LOADS

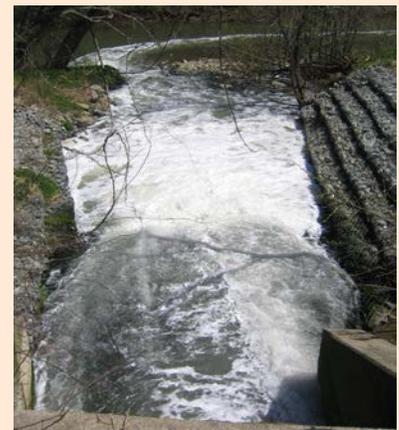
A total maximum daily load (TMDL) is the amount of a specific pollutant that a waterbody can receive and still maintain water quality standards, and meet the goals of the Clean Water Act. The allocation, or allowable amount, of a specific pollutant takes into account both point and nonpoint sources of that pollutant in a watershed.

Point sources include discharges from sewage treatment plants and industrial wastewater facilities. Nonpoint sources are the pollutants that run off from the land.



Resulting effects on streams from sediment and nutrient pollution – “choking” of aquatic life.

The USEPA established a TMDL for the Chesapeake Bay in 2010, with pollution reduction targets for sediment and nutrients established for 2025. Outside of the TMDL established for the Chesapeake Bay, New York, Pennsylvania and Maryland have developed TMDLs for more than 130 smaller watersheds addressing problems associated with sediment and nutrients and identified the reductions needed in local waters. TMDLs define the existing pollution problem and the needed reductions, laying the framework for the restoration actions needed on the landscape.



Municipal wastewater discharge point.