

Integrated Approach for Assessing and Communicating Progress toward the Chesapeake Bay Water-Quality Standards

Scott Phillips
USGS, STAR

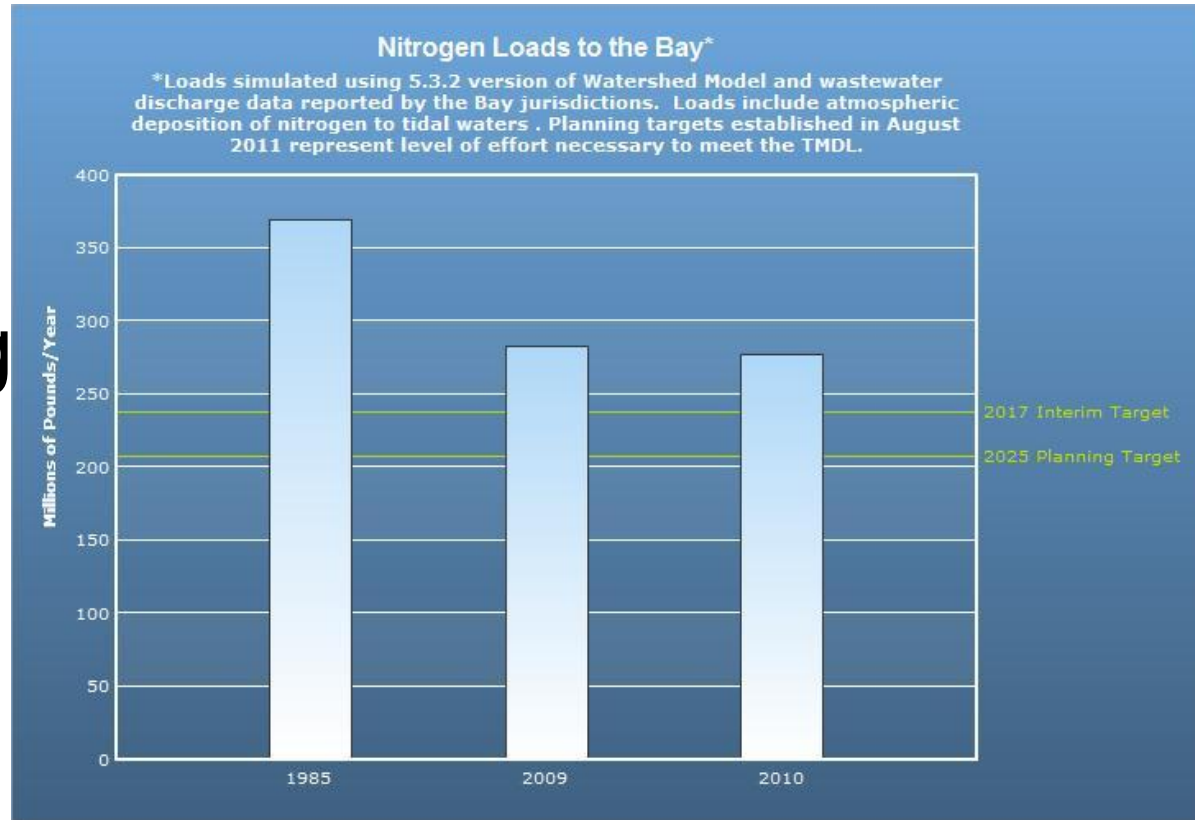
Telling the water-quality story

- How are practices being implemented for the TMDL improving water quality?
- Integrated approach:
 - Practices implemented (TMDL)
 - Nutrients/sediment in watershed
 - Attainment of standards
- WQ GIT-STAR interactions
 - Improve communication
 - Coordinate reporting
- Current information and planned improvements



TMDL-Reporting of BMPs

- BMPs implemented
- Projected load reductions (progress runs)
- Annual reporting and 2-year milestones
- Improved BMP reporting and verification



CBP Nontidal Monitoring

- Nutrients and sediment
- Network
 - Long-term sites
 - Adding stations
- Trends
 - Long term and 10 year
- Loads
 - To the Bay
 - Yields in watershed

Nontidal Water Quality Monitoring Network

Chesapeake Bay Watershed



Monitoring Locations

- Primary
- Secondary
- River Input

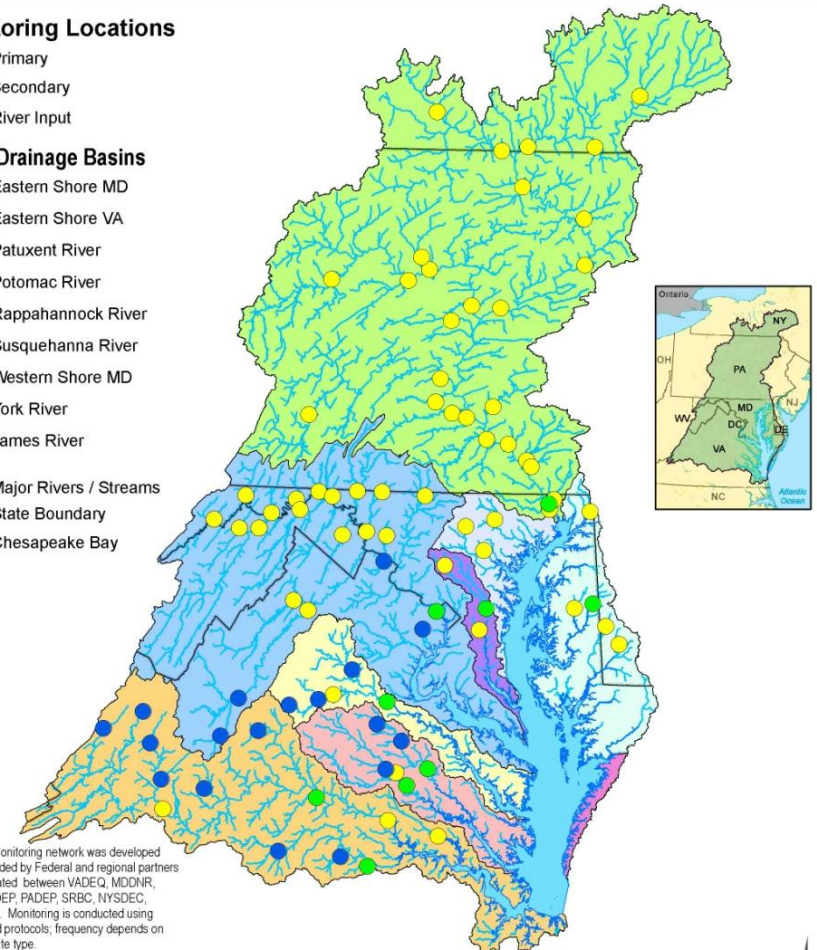
Major Drainage Basins

- Eastern Shore MD
- Eastern Shore VA
- Patuxent River
- Potomac River
- Rappahannock River
- Susquehanna River
- Western Shore MD
- York River
- James River

- Major Rivers / Streams
- State Boundary
- Chesapeake Bay

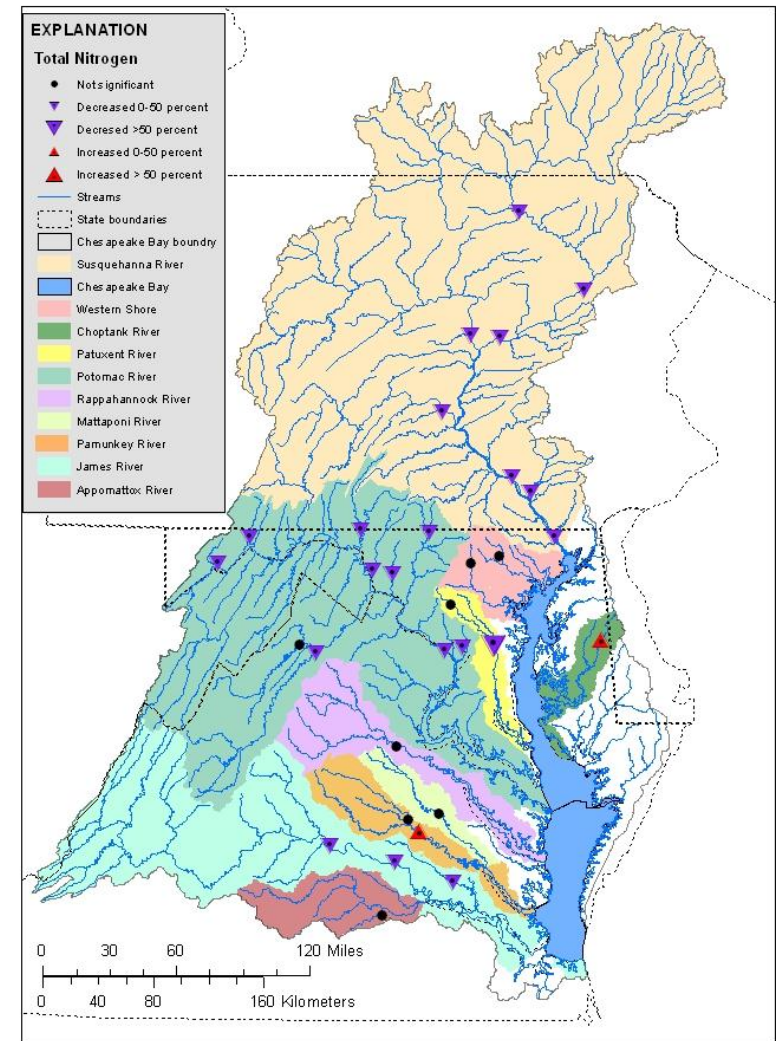
Note: This monitoring network was developed in 2004, funded by Federal and regional partners and coordinated between VADEQ, MDDNR, USGS, WVDEP, PADEP, SRBC, NYSDEC, and DNREC. Monitoring is conducted using standardized protocols; frequency depends on monitoring site type.

Data Source: Chesapeake Bay Program.
For more information, visit www.chesapeakebay.net
Disclaimer: www.chesapeakebay.net/termsofuse.htm



Trends: Nutrients and Sediment

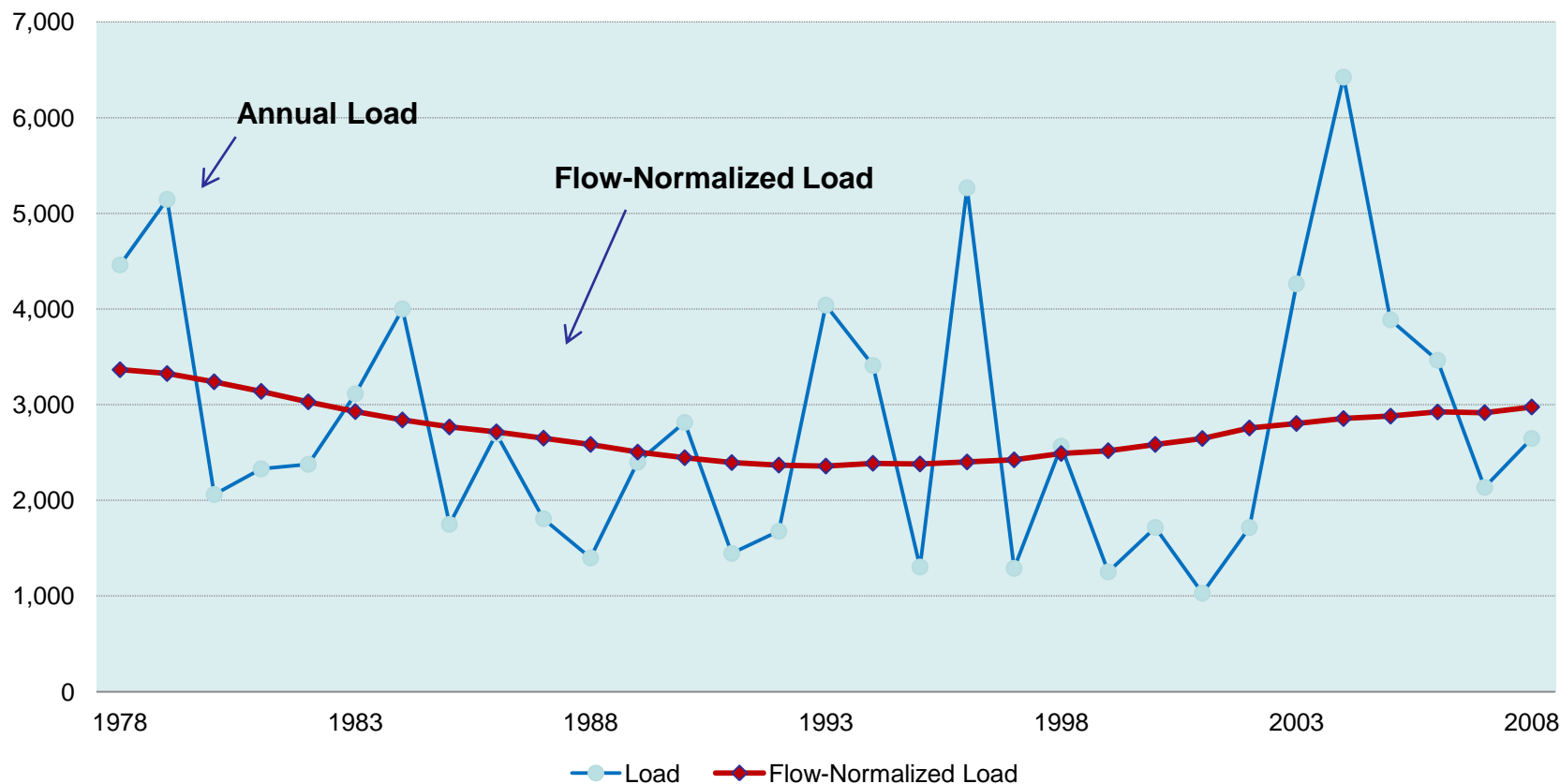
- Trends
 - 1980's-2010
 - 2000-2010
 - Flow adjusted concentrations
- Nitrogen
 - LT: 2/3 of sites improving trends
 - 10 year: half with improving trends or no trends
- Phosphorus
 - LT: 70 percent improving
 - 10 year: 1/3 improving, most no trends
- Sediment
 - LT 30 percent of sites improving, 8 degrading
 - 10 year: 3 sites improving, 9 degrading, most no trend
- New approach for loads over time



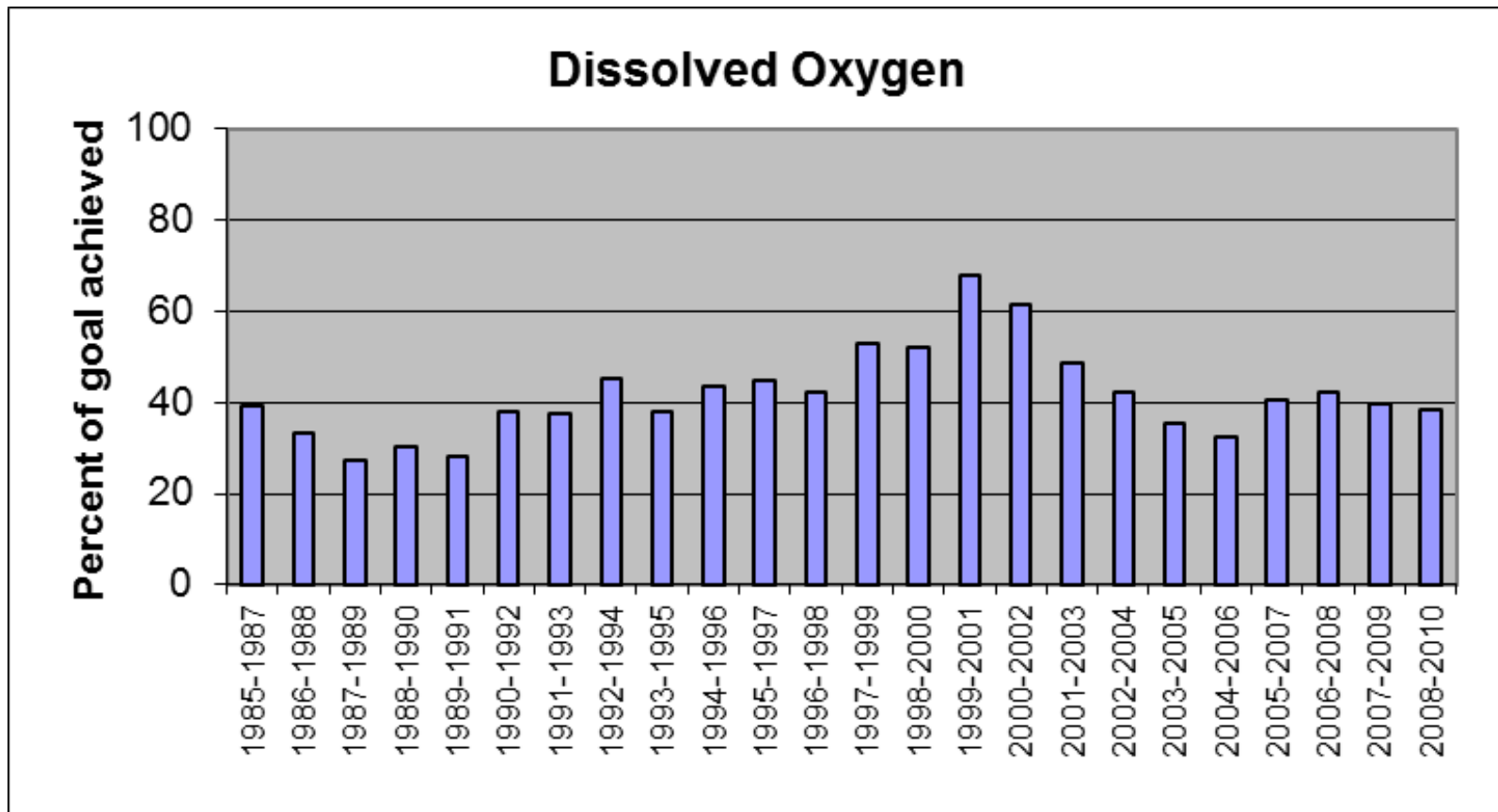
Flow-adjusted trends for total nitrogen for 31 sites in the Chesapeake Bay Watershed, 1985-2010.

New Technique: Change in Load

Susquehanna River At Conowingo, Maryland
Total Phosphorus Load (tons per year)



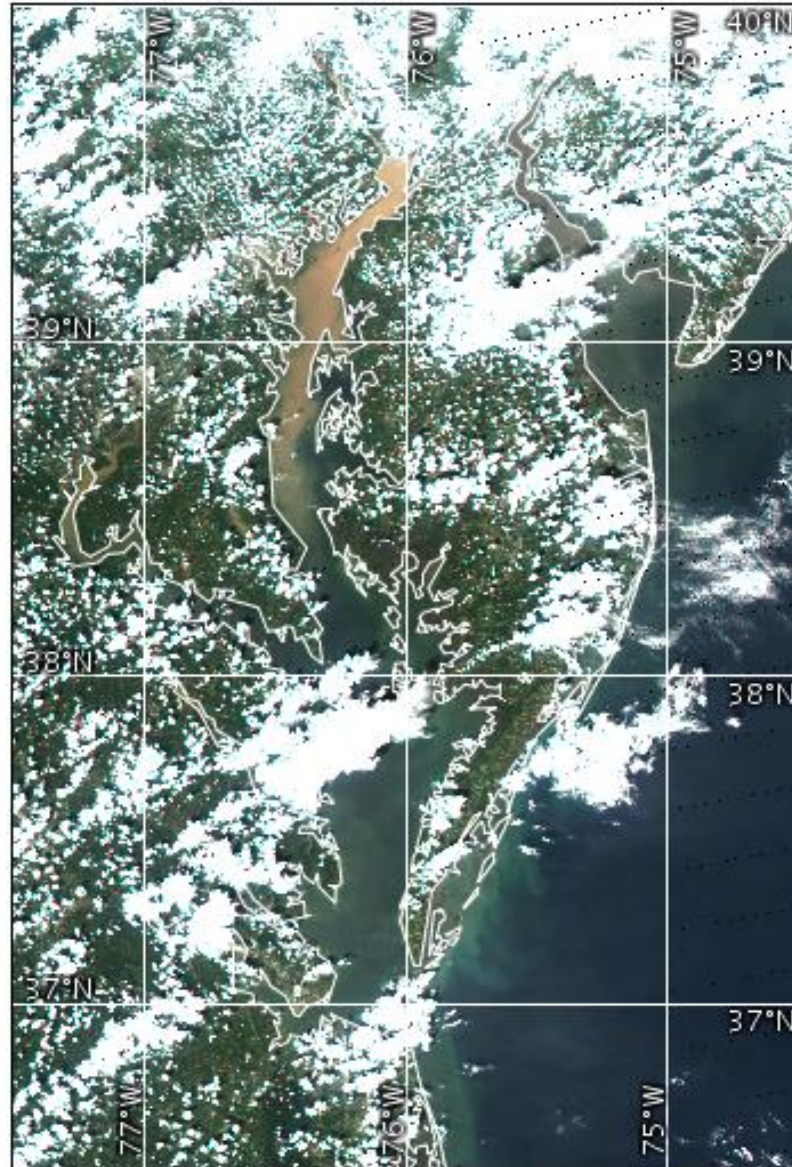
Water-Quality Standards



- DO, clarity, chl-a in progress toward standards
- DO: 38%, Clarity: 18%, Chl-a: 22%
- Enhanced assessments

Tidal Enhancements

- DO monitoring-
NOAA CBIBS
- Remote sensing
- Assessments of
segments



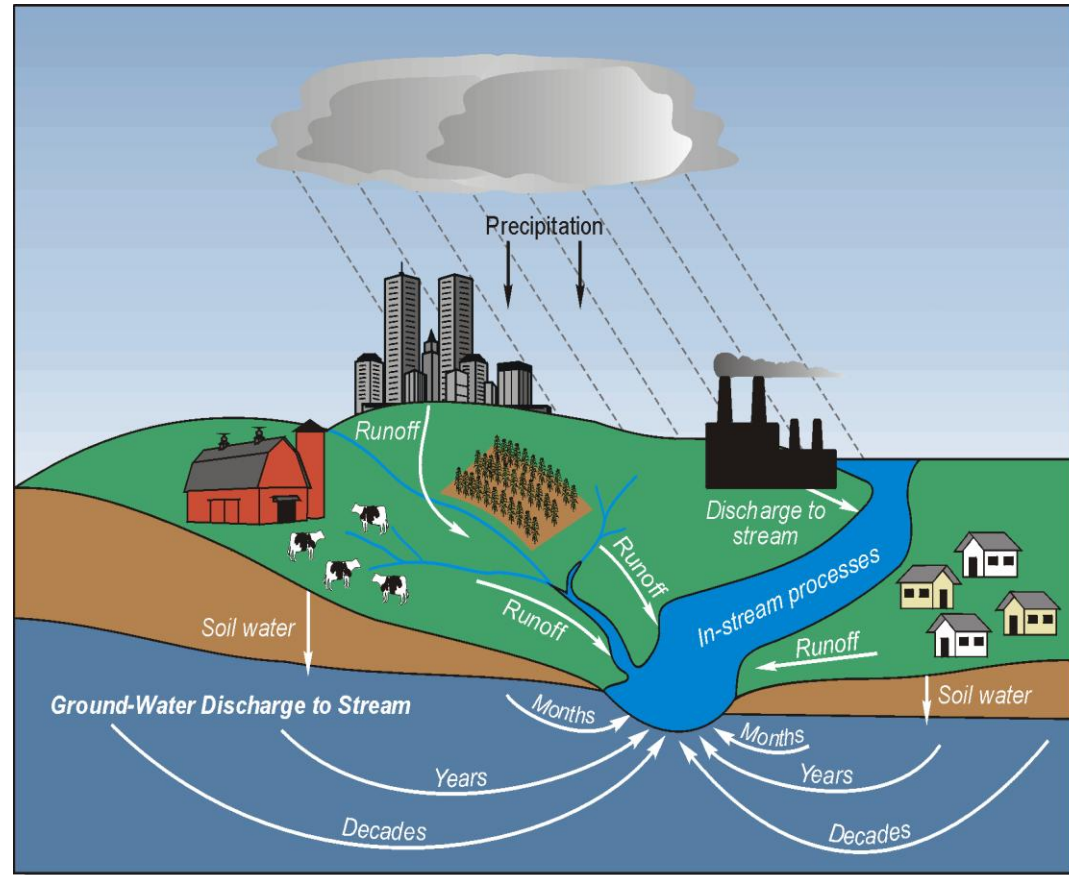
Data courtesy of:
USDOC/NOAA/NESDIS
CoastWatch

Satellite:
AQUA
Sensor:
MODIS
Date:
2011/09/11 JD 254
Start time:
18:05:00 UTC
End time:
18:10:00 UTC
Projection type:
MAPPED
Map projection:
0.28 km/pixel
MERCATOR
Latitude bounds:
35 N -> 41 N
Longitude bounds:
79 W -> 73 W



“Lag times” and water quality

- Management actions
 - Implementation
 - Reaching efficiency
- Watershed
 - Point sources
 - TN
 - Runoff
 - Ground water
 - TP and sediment
 - Storage
 - Storms and runoff
- Estuary
 - Seasonal to annual



Communicating the Story

- What can be provided now?
 - Progress toward milestones
 - Nutrient and sediment trends
 - Attainment of water-quality standards
 - Planned improvements for accountability
- Reporting opportunities in the future:
 - Annual updates
 - 2-yr milestones
 - 2017 evaluation
 - 2025 attainment of TMDL

Planned Improvements

- Improvements for integrated reporting:
 - Decision framework (WQGIT)
 - Expanded watershed monitoring (EPA/States/DC/USGS) and trends in loads (USGS)
 - Monitoring and Attainment of Standards (EPA/STAR/NOAA)
 - “Lag times” workshop (STAC)
 - Reports to explain water quality changes
 - “Lessons learned” report (STAR)
 - USGS/STAR: Eastern Shore (2013), Potomac (2015)

PSC Decisions

- Endorsed development of integrated approach to assess progress toward water-quality standards and relation to TMDL:
 - Progress in BMP implementation
 - Nutrient and sediment trends
 - Attainment of standards
 - Enhanced accountability
- Watershed trends and standards attainment for EC meeting package
- STAR (NTWG and TMAW) need to work on next steps and interact with WQGIT