



2012 Draft
Water Quality Assessment
and
Impaired Waters
Integrated Report

Virginia Department of Environmental Quality

March 2012



Public Comment

- Public comment period: March 26 – April 27
- Download Integrated Report via DEQ website:
 - <http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2012305b303dIntegratedReport.aspx>
 - Maps available at:
http://www.deq.virginia.gov/mapper_ext/Index.aspx/
- Webinar to be held on April 9th, 10 AM - noon
- Comments received either by first class mail to:
John Kennedy
DEQ-Water Quality Monitoring and Assessment
P.O. Box 1105
Richmond, VA 23218-1105
- Or via e-mail: john.kennedy@deq.virginia.gov

Key Factors for the Assessment

- Clean Water Act and VA Water Quality Monitoring, Information and Restoration Act require state to assess and report on the quality of state waters
- Assessments conducted in reference to VA Water Quality Standards as of January 2011
- Six Year Assessment Period: Jan. 2005 – Dec. 2010
- WQ data evaluated for multiple samples collected by DEQ at 5,497 stations
- 1,786 citizen monitoring stations used for assessment determinations

Designated Uses

DESIGNATED USE	SUPPORT OF USE DEMONSTRATED BY
Aquatic Life Use (sub-divided in Chesapeake Bay and Tributaries)	Conventional Pollutants (Dissolved Oxygen, pH, Temp.); Nutrients and toxic contaminants found in sediments, toxics in water column; Biological evaluation
Fish Consumption Use	Advisories, limiting or restricting consumption (VDH); Exceeding state screening values for toxic pollutants found in fish tissue
Shellfish Consumption Use	Restricted harvesting and marketing of shellfish resources by Div of Shellfish Sanitation of VDH
Swimming/Recreation Use	Conventional Pollutant (Fecal Coliform Bacteria, E. coli, enterococci) and/or beach closures issued by VDH
Public Water Supply Use	Closures or advisories by VDH; comparison of data to applicable public water supply standards
Wildlife Use	Aquatic life toxics criteria in water column

Monitoring Program Elements

- Ambient Watershed Network
- Estuarine Probabilistic
- Chesapeake Bay
- Citizen-Requested Monitoring
- Facility Inspection
- Freshwater Probabilistic
- Fish Tissue
- Mercury
- Incident Response
- Pollution Complaints
- Regional Biological
- Reservoir Monitoring
- Special Studies
- TMDL
- Trend Stations
- Observed Effects
- Non-agency Data

EPA Integrated List

EPA Assessment Categories (since 2004):

- 1 = Water Quality Fully Supports All Designated Uses
- 2 = Water Quality Fully Supports All Uses Assessed
- 3 = Insufficient Data to make Assessment
- 4 = Impaired (No TMDL Needed)
- 5 = Impaired (TMDL May Be Needed)
- Virginia added additional Subcategories in 2006 to help track TMDL implementation

2012 Assessed Areas

Waterbody Type	Total	Assessed	Attained Use	Impaired ¹
Rivers (miles)	52,255	18,492 (35% of total)	5,347 (29% of assessed)	13,145 (71% of assessed)
Lakes (acres)	116,364	113,678 (98% of total)	19,638 (17% of assessed)	94,041 (83% of assessed)
Estuaries (sq. miles)	2,684	2,268 (85% of total)	139 (6% of assessed)	2,129 (94% of assessed)

¹ "Impaired" applies to both EPA Assessment Categories 4 and 5

Note: Size adjustments using high resolution hydrography data account for discrepancies from prior cycle.

New Impaired Water Listings

New Impairments (Category 5A) in 2012:

- Areas not previously scheduled for TMDLs; excluding both shellfish and natural impairments:
 - 846 miles of Rivers/Streams
 - 100 acres of Lakes
 - 2 square miles of Estuaries

Delisting of Waters 2002 - 2010

- Running total of 315 Fully Restored Waters
 - 51 additional Full Delistings submitted for 2012:
 - 264 miles of Rivers/Streams
 - 2,710 acres of Lakes
 - 4 square miles of Estuaries
- Running total of 1,518 Partially Restored Parameters
 - 389 additional Partial Delistings Proposed for 2012:
 - 233 miles of Rivers/Streams
 - 4,064 acres of Lakes
 - 664 square miles of Estuaries

Additional Progress Indicators and Delisting Information

- Chesapeake Bay:
 - Parts of mainstem western shore have sufficient water clarity to support submerged aquatic vegetation (SAV). This was the first time water clarity has been extensively studied in the mainstem.
 - Considerable SAV growth seen across the mainstem and tributaries. Upper Rappahannock and lower James, in particular, have seen dramatic increases since 2008. While still not achieving our goal, progress is encouraging.
 - Improved benthic community integrity found in the Elizabeth River.
 - There are a number of previously condemned shellfishing areas that VDH has now deemed harvestable.
 - As elsewhere in the state, estuarine waters are also seeing declines in bacteria to such an extent that some areas can be delisted.

Additional Progress Indicators and Delisting Information (cont.)

- Freshwater bacteria is the parameter most frequently involved in proposed delistings.
- Fish tissue monitoring program suspension due to limited resources has affected assessment and potential delisting of waters for toxics; limited program restarting this year.
- Some delisted waters do come back on the list, but seriously impaired waters tend to stay on the list, allowing us to focus our resources on those areas.

Water Quality Restoration Progress* in Virginia



315 Fully Restored Waters

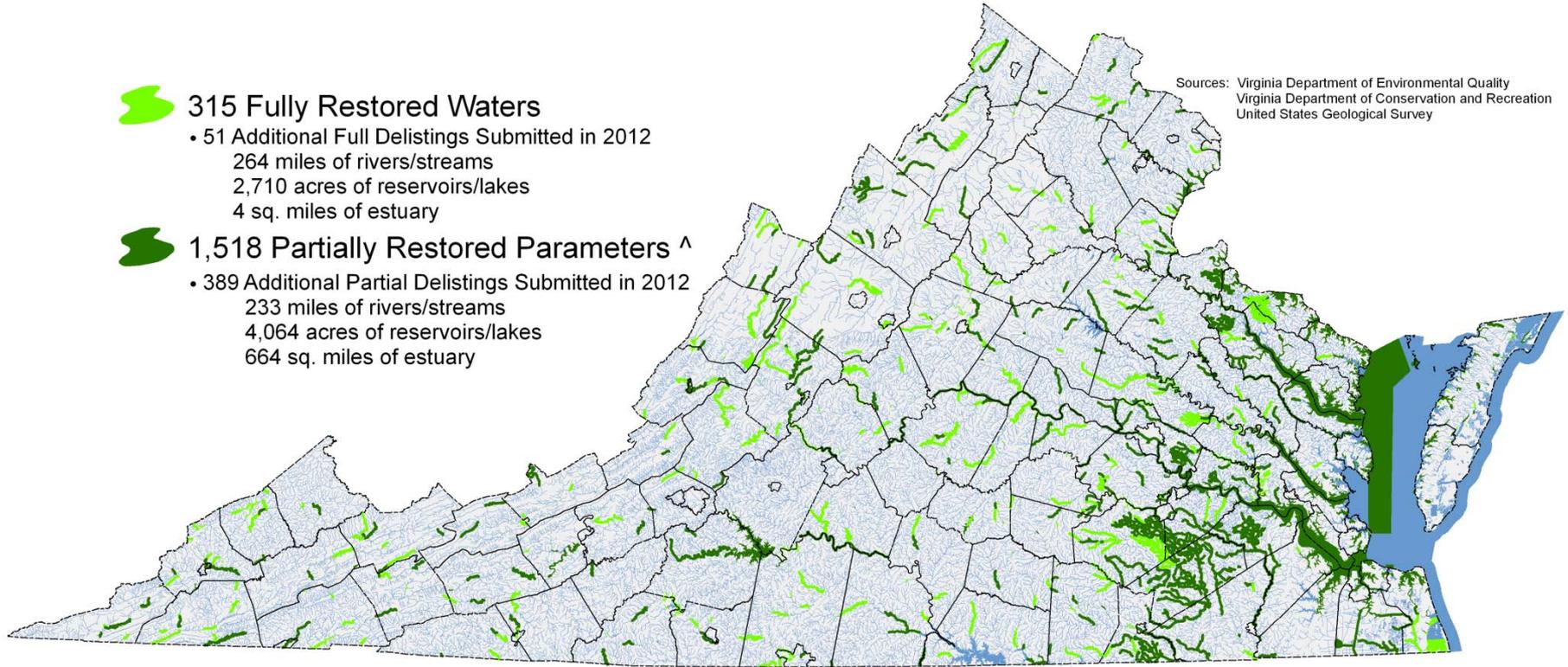
- 51 Additional Full Delistings Submitted in 2012
264 miles of rivers/streams
2,710 acres of reservoirs/lakes
4 sq. miles of estuary



1,518 Partially Restored Parameters [^]

- 389 Additional Partial Delistings Submitted in 2012
233 miles of rivers/streams
4,064 acres of reservoirs/lakes
664 sq. miles of estuary

Sources: Virginia Department of Environmental Quality
Virginia Department of Conservation and Recreation
United States Geological Survey



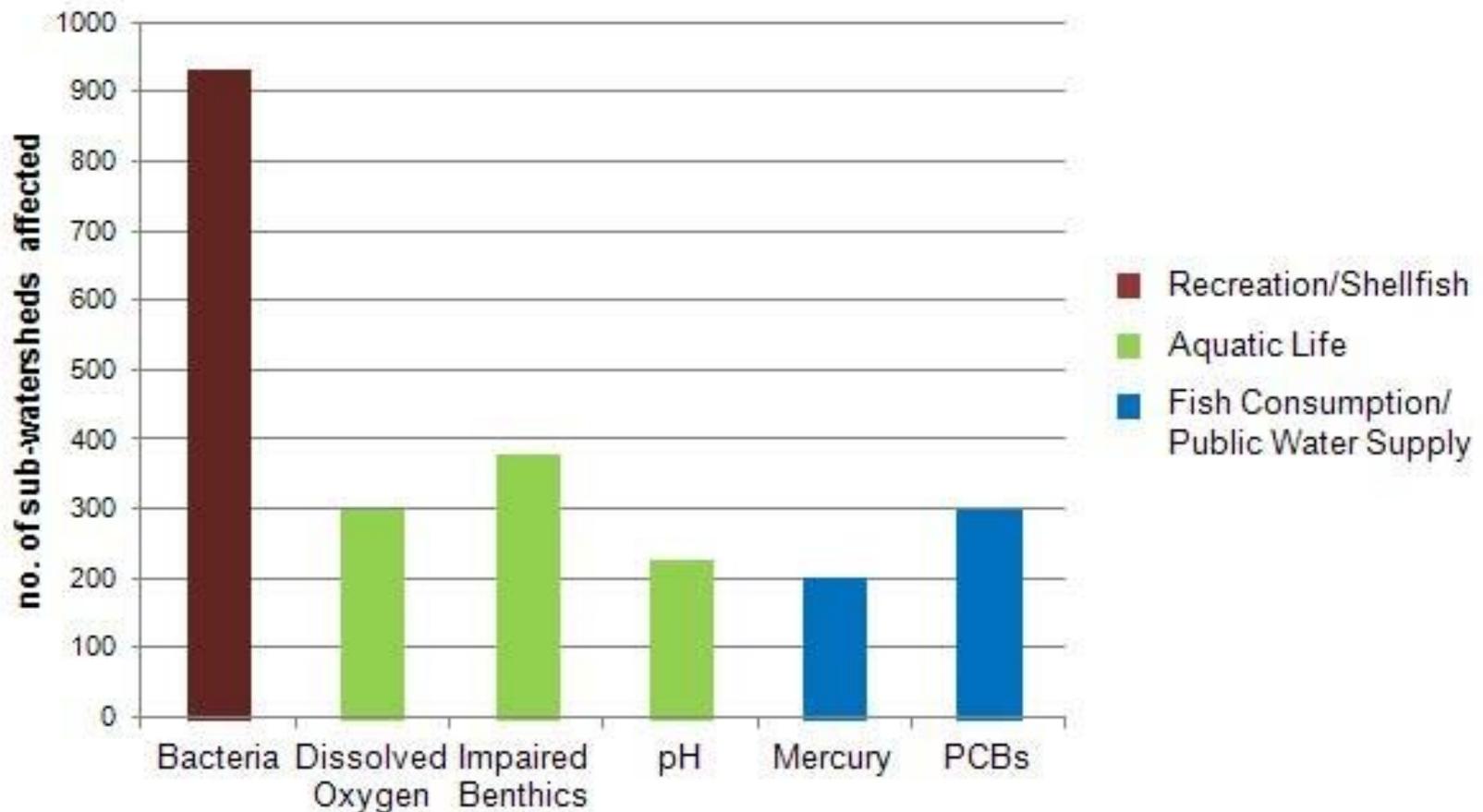
* Restoration progress (i.e. Delist status) is cumulative thru February 2012.

[^] Partial delisting totals are parameter based but include over 700 water bodies.

443 amended water permits are not included in the numbers above which equates to 273 Fully Delisted Part 2 facilities and 170 Partially Delisted Part 2 facilities.

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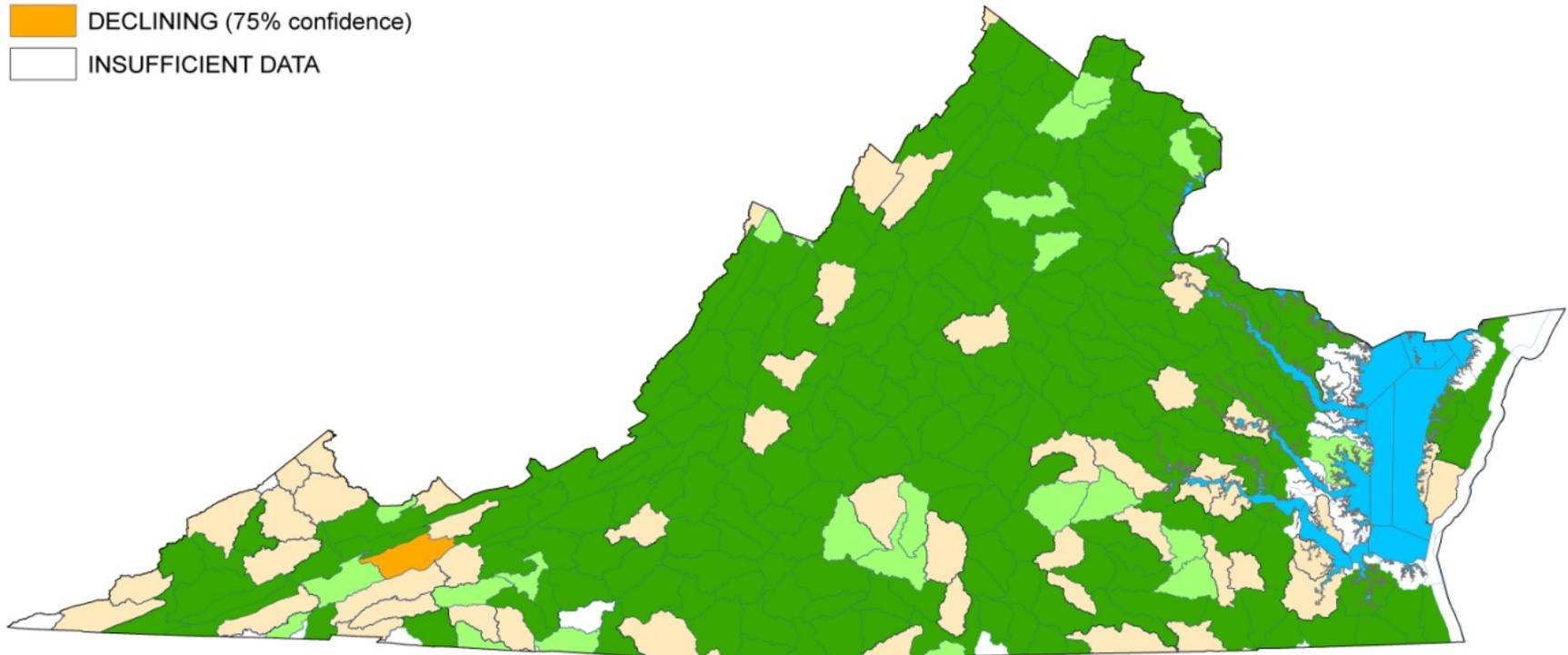
Common Causes of Designated Use Impairment



Integrated Water Quality Trends 1991 to 2010 Bacteria in Rivers and Streams

STREAM BACTERIA

-  SIGNIFICANT IMPROVEMENTS (90% confidence)
-  IMPROVING (75% confidence)
-  NO CHANGE (less than 75% confidence)
-  DECLINING (75% confidence)
-  INSUFFICIENT DATA



Virginia Department of Environmental Quality
Comprehensive Environmental Data System
IWQ analysis developed by R.E. Stewart and D.H. Smith.

NWBD 5th order layer provided by the Virginia Department of Conservation and Recreation

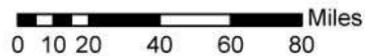
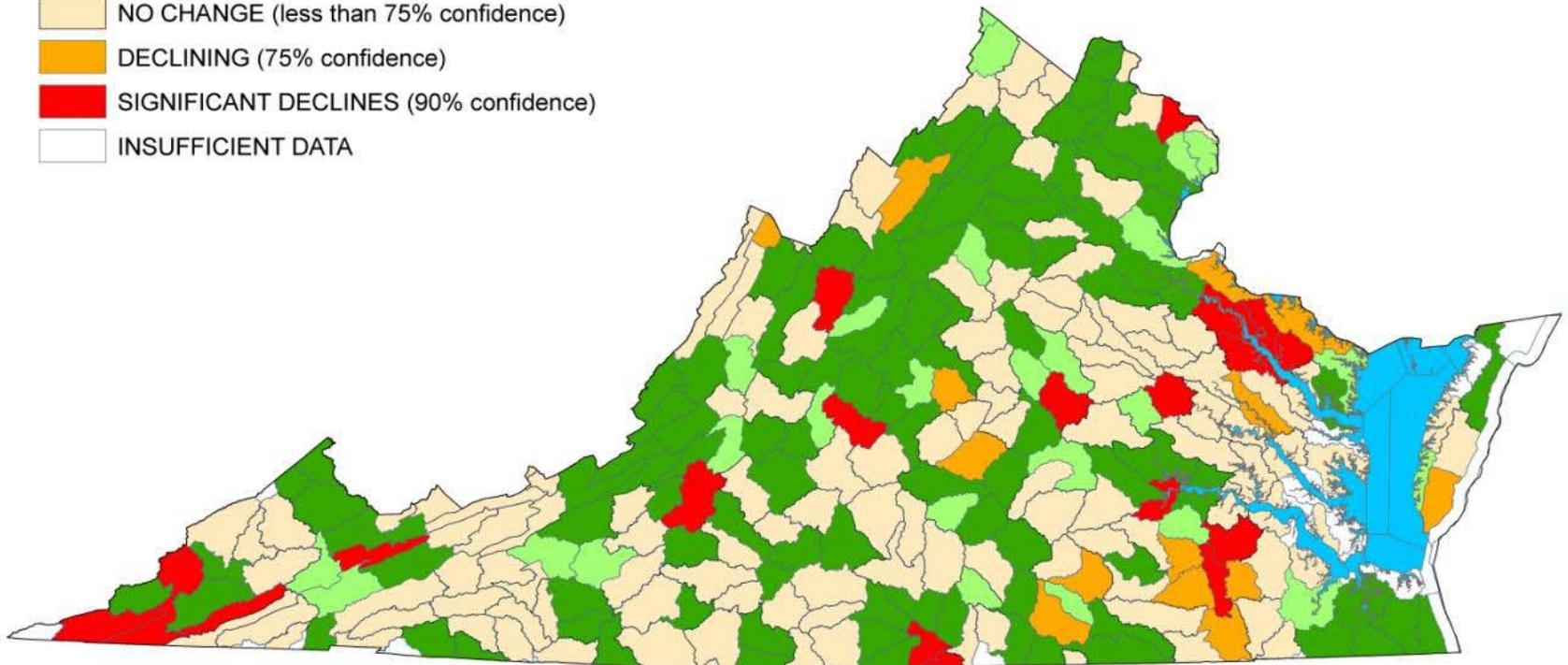
Map created on 14 July 2010.

Integrated Water Quality Trends 1991 to 2010

Nitrogen in Rivers and Streams

STREAM NITROGEN

-  SIGNIFICANT IMPROVEMENTS (90% confidence)
-  IMPROVING (75% confidence)
-  NO CHANGE (less than 75% confidence)
-  DECLINING (75% confidence)
-  SIGNIFICANT DECLINES (90% confidence)
-  INSUFFICIENT DATA



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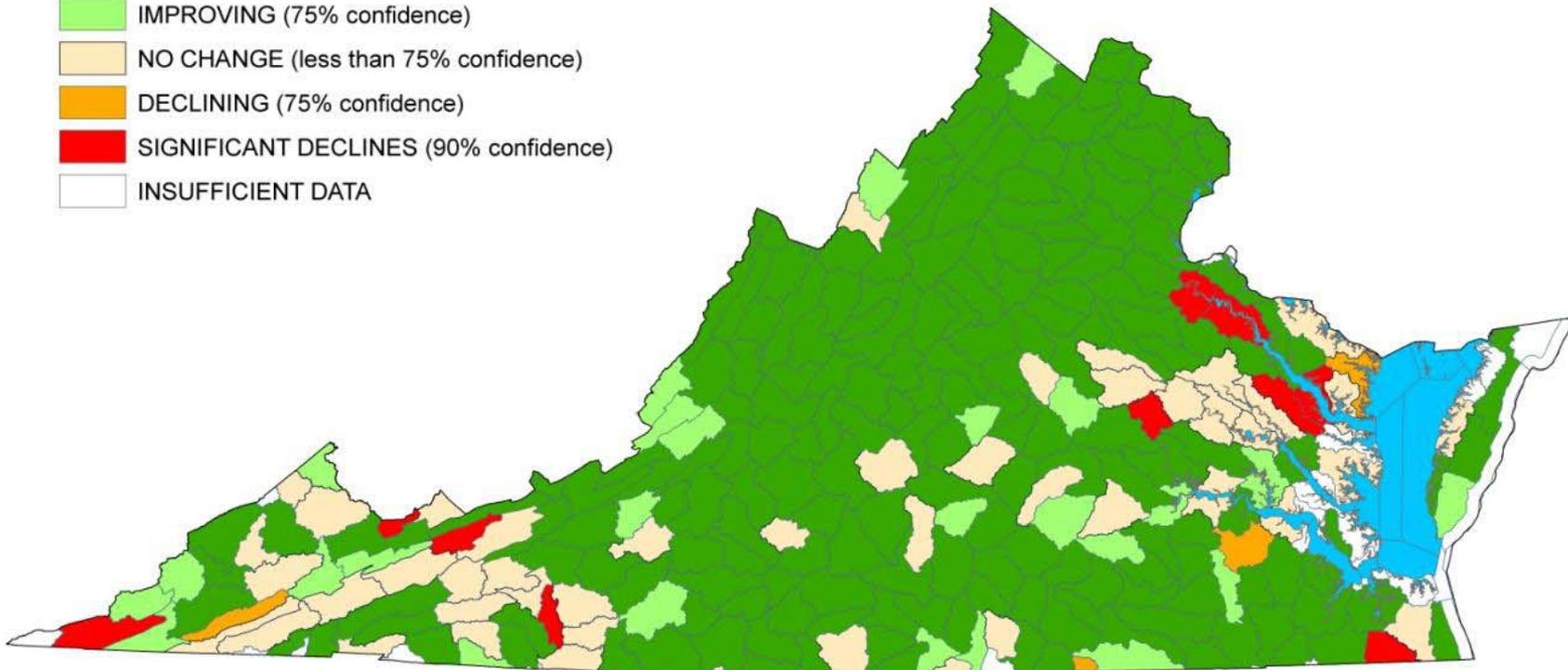
NWBD 5th order layer provided by the Virginia Department of Conservation and Recreation

Map created on 14 July 2010.

Integrated Water Quality Trends 1991 to 2010 Phosphorus in Rivers and Streams

STREAM PHOSPORUS

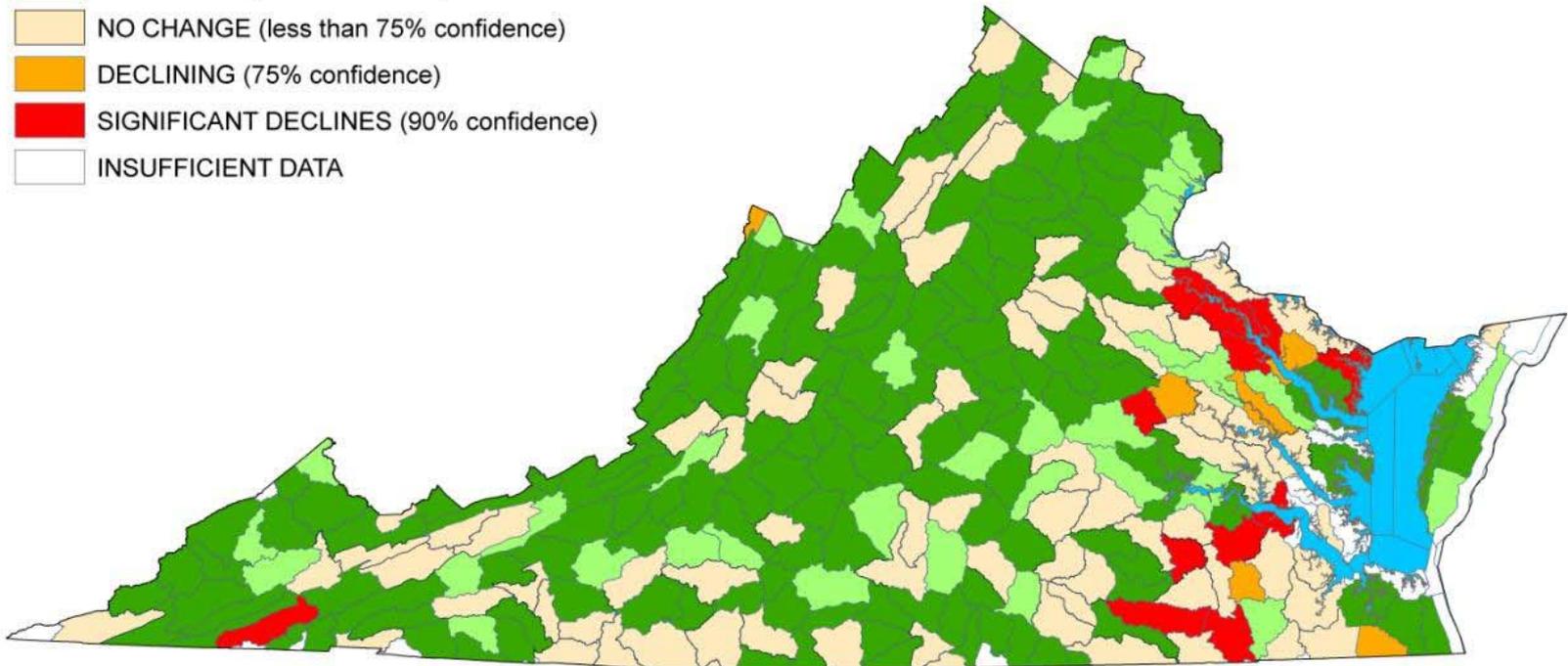
-  SIGNIFICANT IMPROVEMENTS (90% confidence)
-  IMPROVING (75% confidence)
-  NO CHANGE (less than 75% confidence)
-  DECLINING (75% confidence)
-  SIGNIFICANT DECLINES (90% confidence)
-  INSUFFICIENT DATA



Integrated Water Quality Trends 1991 to 2010 Suspended Solids in Rivers and Streams

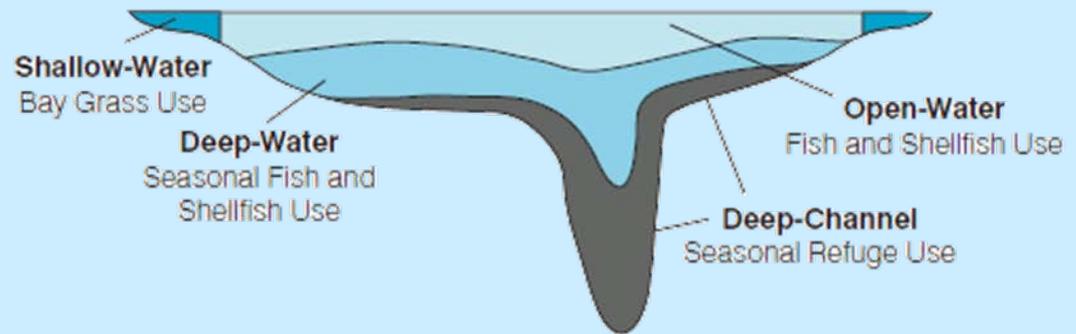
STREAM SOLIDS

-  SIGNIFICANT IMPROVEMENTS (90% confidence)
-  IMPROVING (75% confidence)
-  NO CHANGE (less than 75% confidence)
-  DECLINING (75% confidence)
-  SIGNIFICANT DECLINES (90% confidence)
-  INSUFFICIENT DATA

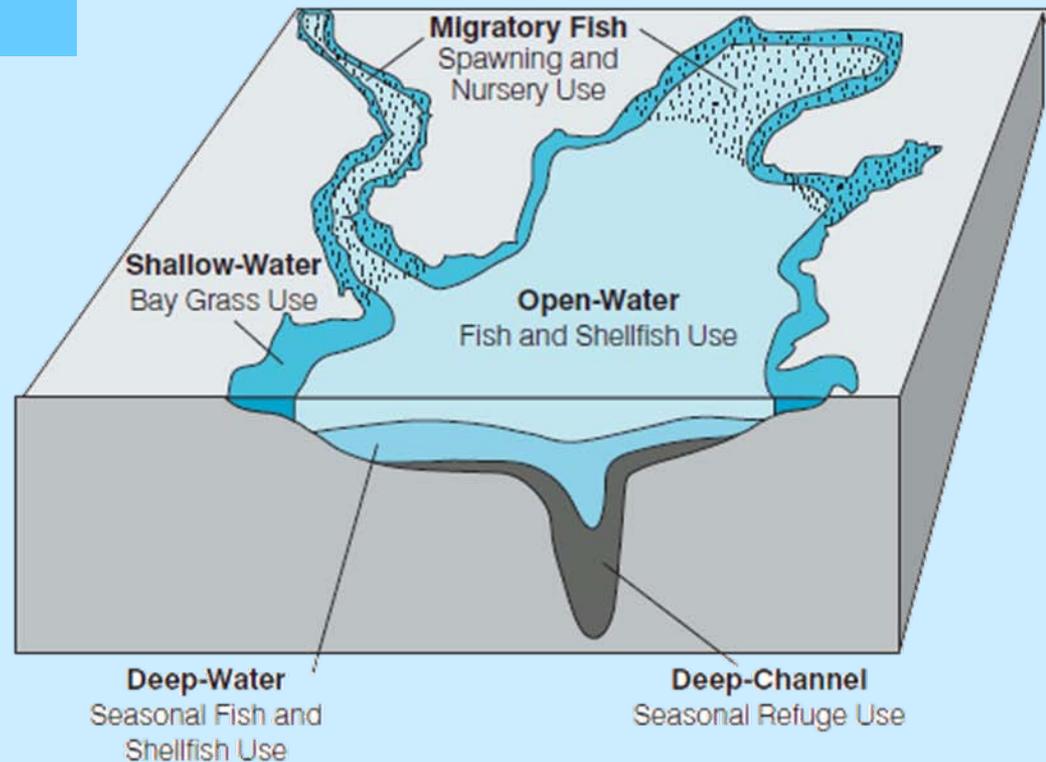


Ches. Bay & Tidal Tributaries Refined Designated Uses

A. Cross-Section of Chesapeake Bay or Tidal Tributary

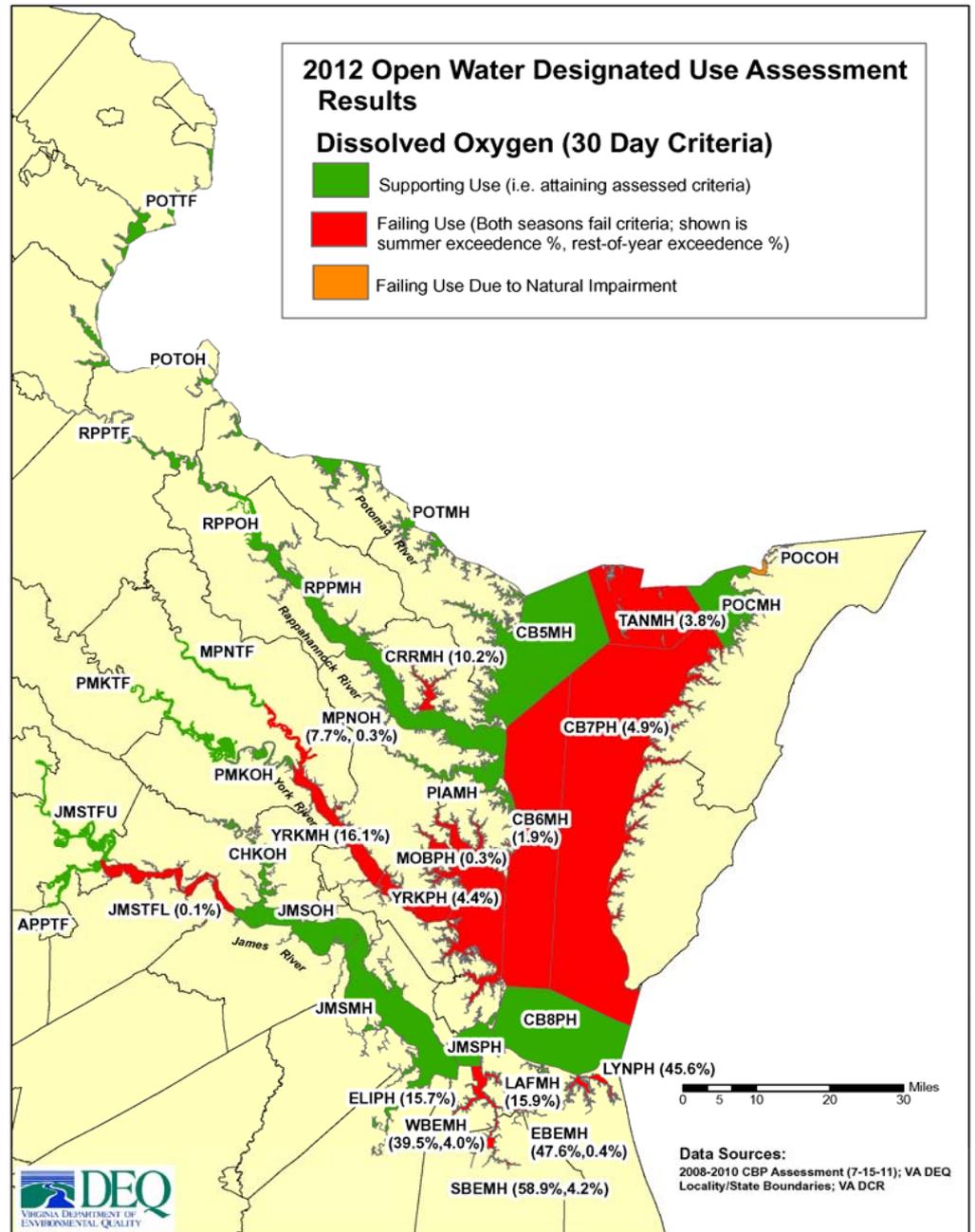


B. Oblique View of the Chesapeake Bay and its Tidal Tributaries



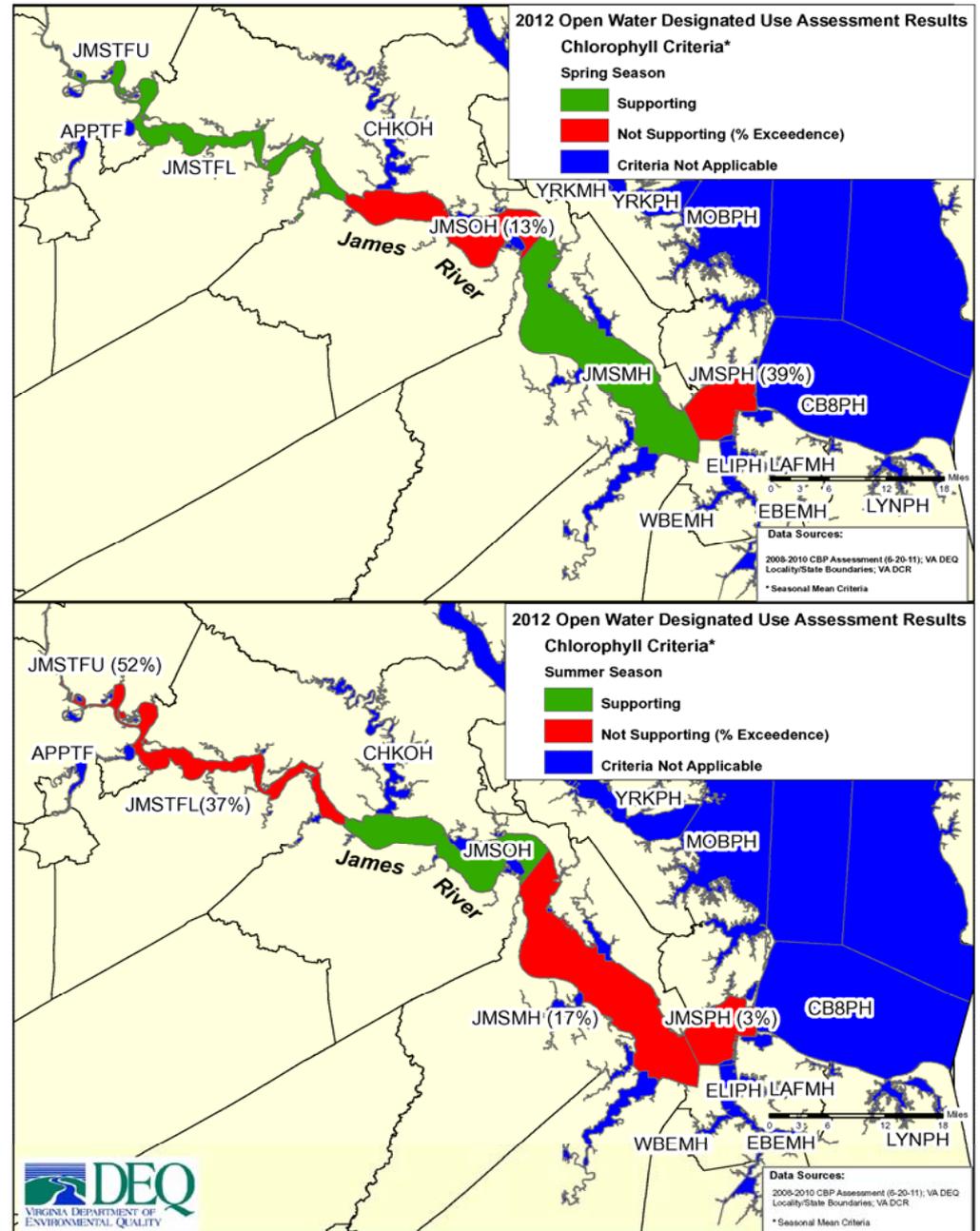
Ches. Bay and Tidal Tributaries:

- Highest Dissolved Oxygen violation rates are in the Elizabeth, Lynnhaven, and York Rivers.
- Mainstem Bay had relatively low violation rates.



Ches. Bay and Tidal Tributaries:

- Numeric Chlorophyll criteria only apply to the James River
- Criteria were met in:
 - Upper & Lower James during the spring season
 - Middle James during the summer season

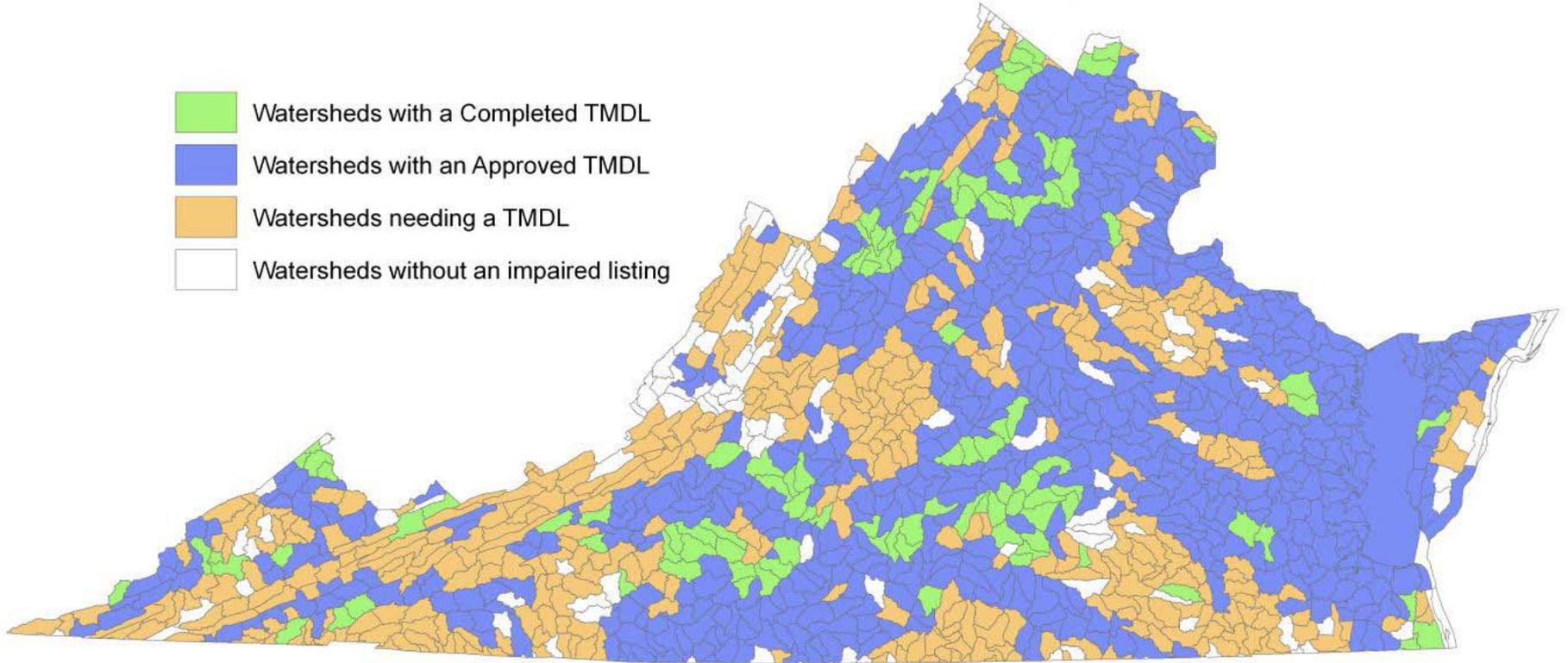


Steps in Total Maximum Daily Load (TMDL) Process

- Place Impaired Waters on 303(d) List due to Water Quality Standards violations
- Develop TMDL for Impaired Waters:
 - 939 developed through 2011
 - Nearly 1,000 more TMDLs to develop
- Develop TMDL Implementation Plan:
 - 166 completed through 2011
 - 25 more in progress
- Remove Waters from 303(d) List when Water Quality Standards achieved

TMDL Completion Status in Virginia

-  Watersheds with a Completed TMDL
-  Watersheds with an Approved TMDL
-  Watersheds needing a TMDL
-  Watersheds without an impaired listing



Note: Some watersheds have multiple impairments with differing TMDL completion dates. TMDL status as of December 2011.



Sources: Virginia Department of Environmental Quality
Virginia Department of Conservation and Recreation
United States Geological Survey

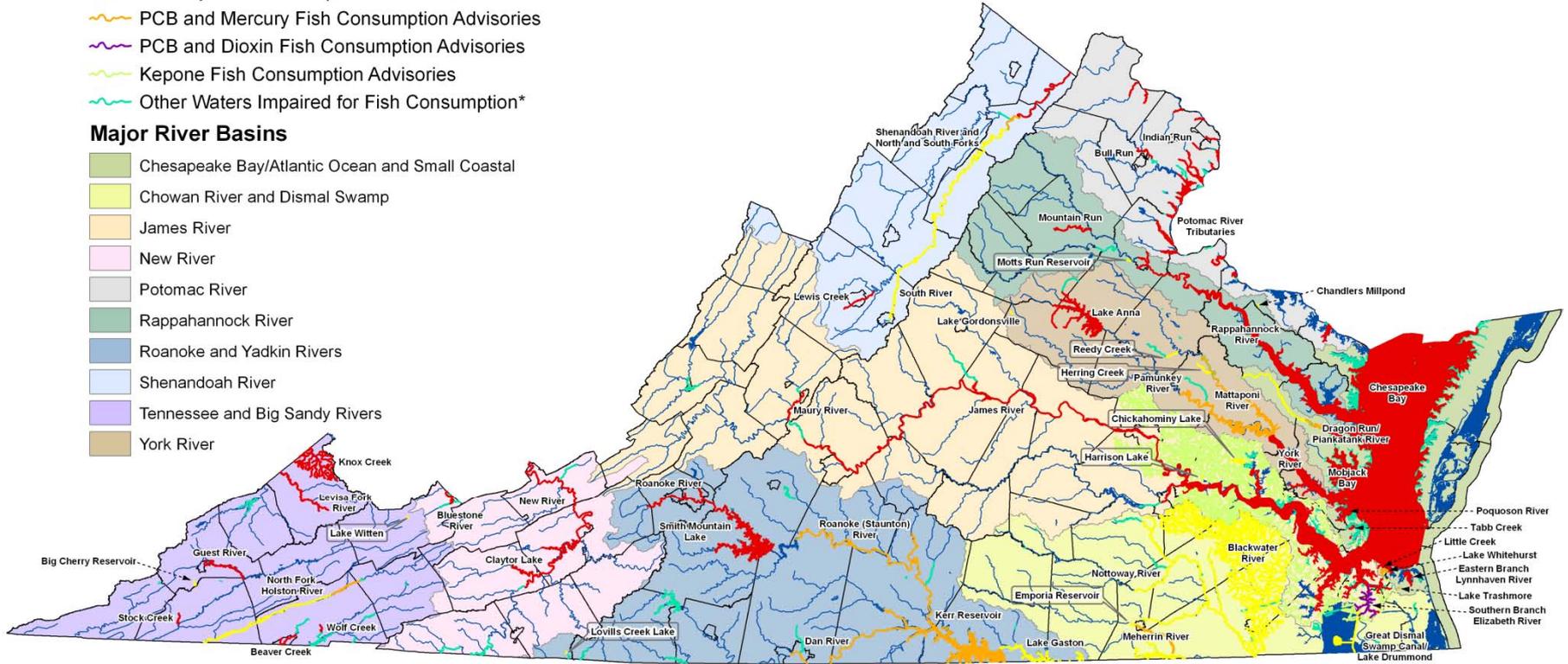
Waters Under VDH Fish Consumption Advisories

Identified in the 2012 305(b)/303(d) Water Quality Integrated Report

-  PCB Fish Consumption Advisories
-  Mercury Fish Consumption Advisories
-  PCB and Mercury Fish Consumption Advisories
-  PCB and Dioxin Fish Consumption Advisories
-  Kepone Fish Consumption Advisories
-  Other Waters Impaired for Fish Consumption*

Major River Basins

-  Chesapeake Bay/Atlantic Ocean and Small Coastal
-  Chowan River and Dismal Swamp
-  James River
-  New River
-  Potomac River
-  Rappahannock River
-  Roanoke and Yadkin Rivers
-  Shenandoah River
-  Tennessee and Big Sandy Rivers
-  York River



* Waters identified by DEQ as unsafe for fish consumption in addition to waters with VDH advisories.

Sources: Virginia Department of Health
 Virginia Department of Environmental Quality
 Virginia Department of Conservation and Recreation
 United States Geological Survey