Integrated Water Quality Assessment in NJ

Presented by

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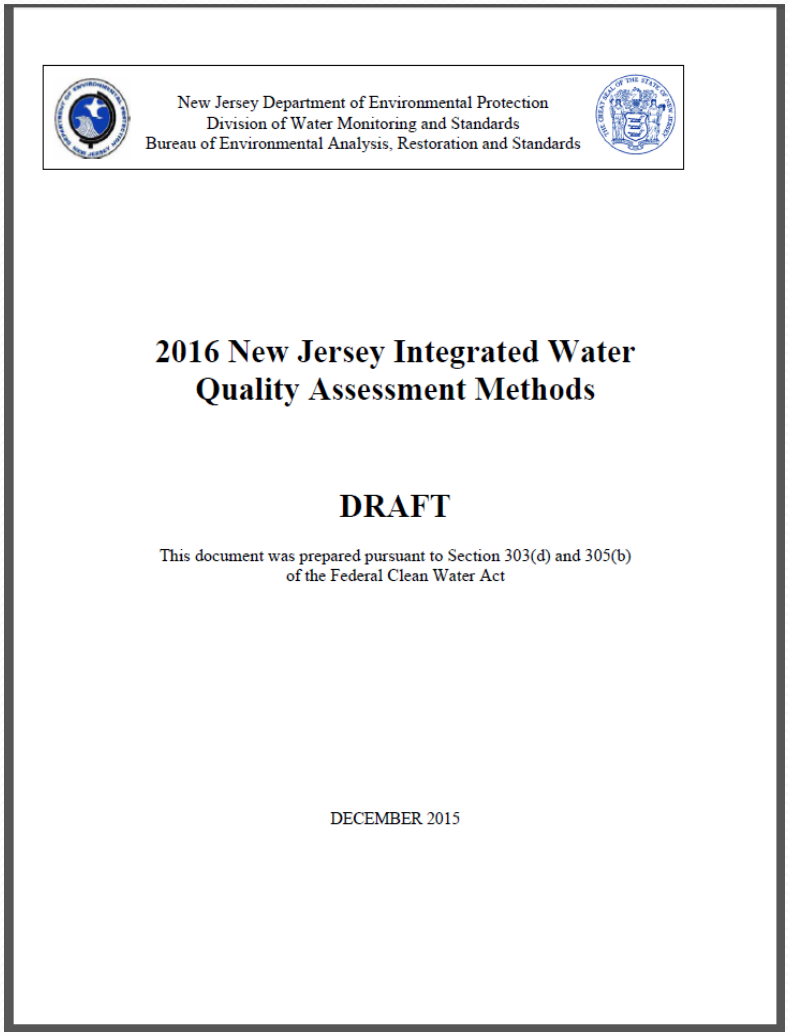
General Assessment Process

- Assessment Methods Document – it all starts here
- Getting the data
- Assessment process - "Crunching the numbers"
  - Station level
  - HUC14 level rollup
  - Designated Use support
- Comprehensive Assessment - Bringing in other lines of evidence
- Final Assessment Results

Methods Document

- Integrated Water Quality Assessment Methods (Methods Document)
- Establish data requirements
- Refine assessment units boundaries
- Refine assessment methods
- Integrated listing guidance
- TMDL ranking and prioritization



New Jersey Department of Environmental Protection
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2016 New Jersey Integrated Water Quality Assessment Methods

DRAFT

This document was prepared pursuant to Section 303(d) and 305(b) of the Federal Clean Water Act

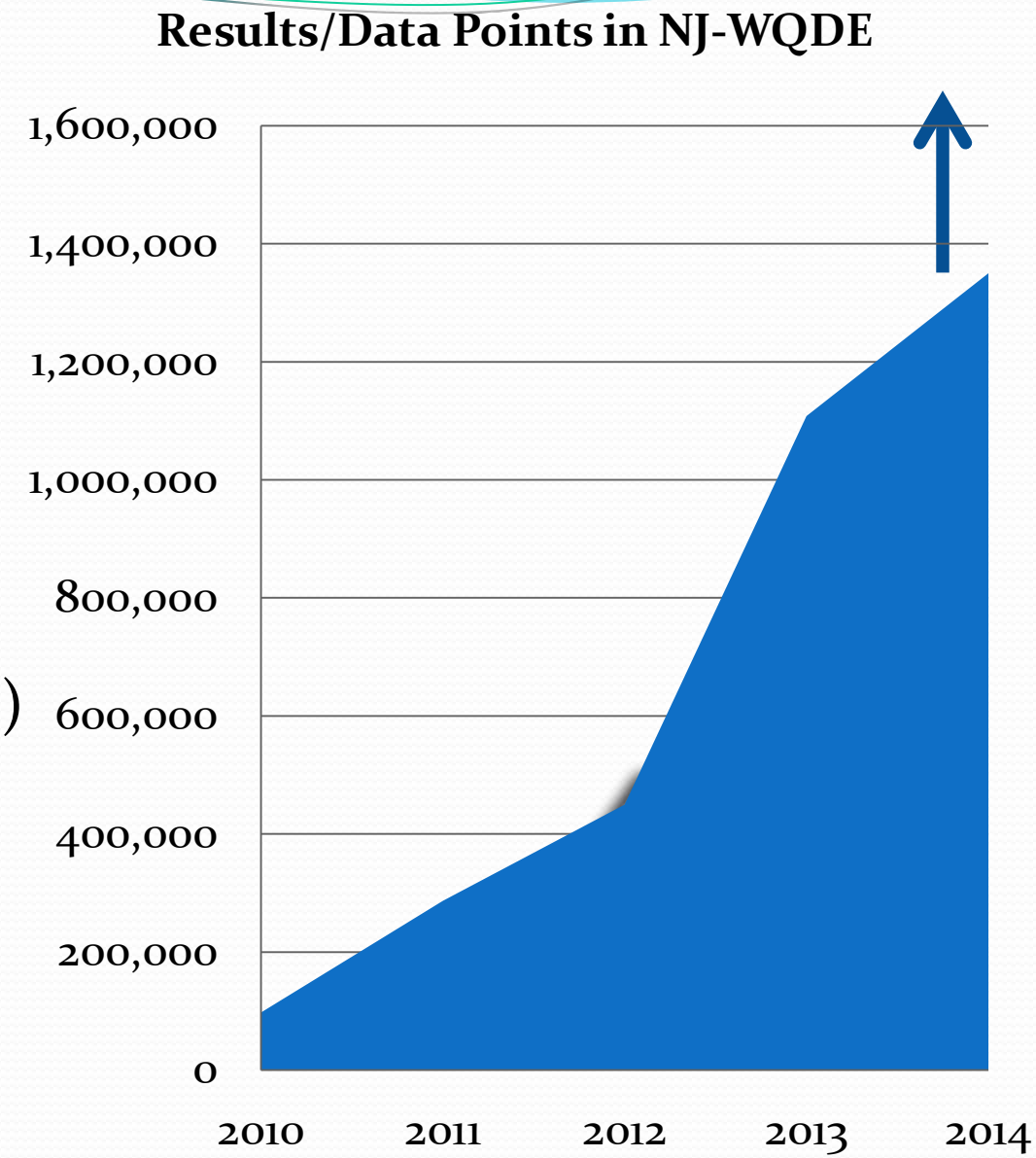
DECEMBER 2015

Whose Data Do We Use?

- NJDEP
- Monitoring Partners
  - Federal agencies: USEPA, USGS, NOAA
  - Interstate commissions: DRBC, IEC
  - Regional, county, and municipal government agencies: Brick Township MUA, Monmouth County Health Department, Pinelands Commission
  - Volunteer monitoring organizations/ watershed associations
  - AmeriCorps NJ Watershed Ambassadors
  - Other entities: Dischargers (NJHDG), water purveyors (NJWSA), academic institutions (Rutgers)

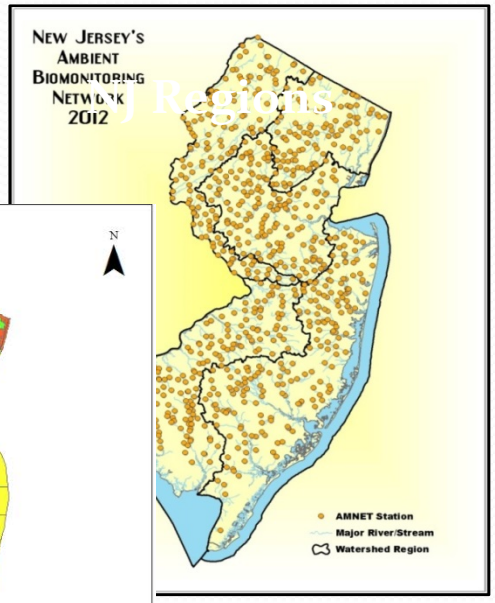
How Much Data Do We Use?

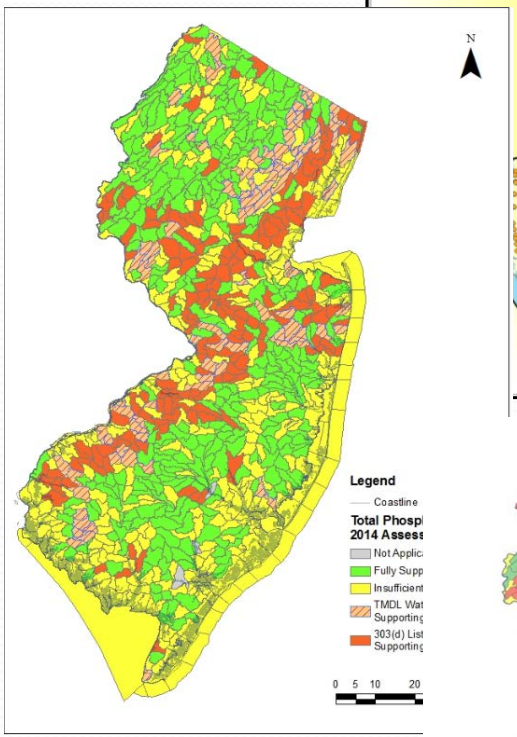
- Numerous networks and partners
- Over 11,000 monitoring stations
- Over 3 million discrete data (over half in WQDE)
  - > 300 continuous monitoring stations
  - > 90 parameters
  - Biological data

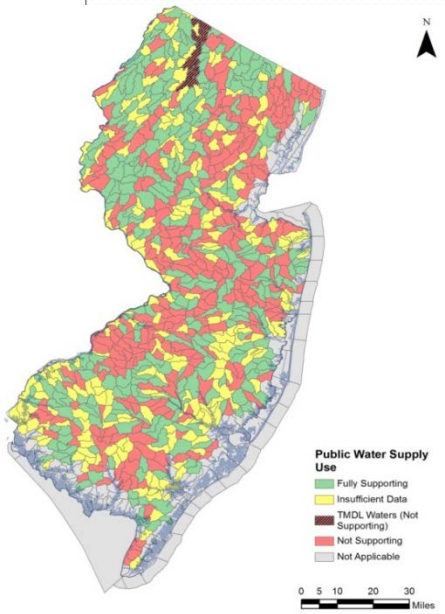


Assessment Process

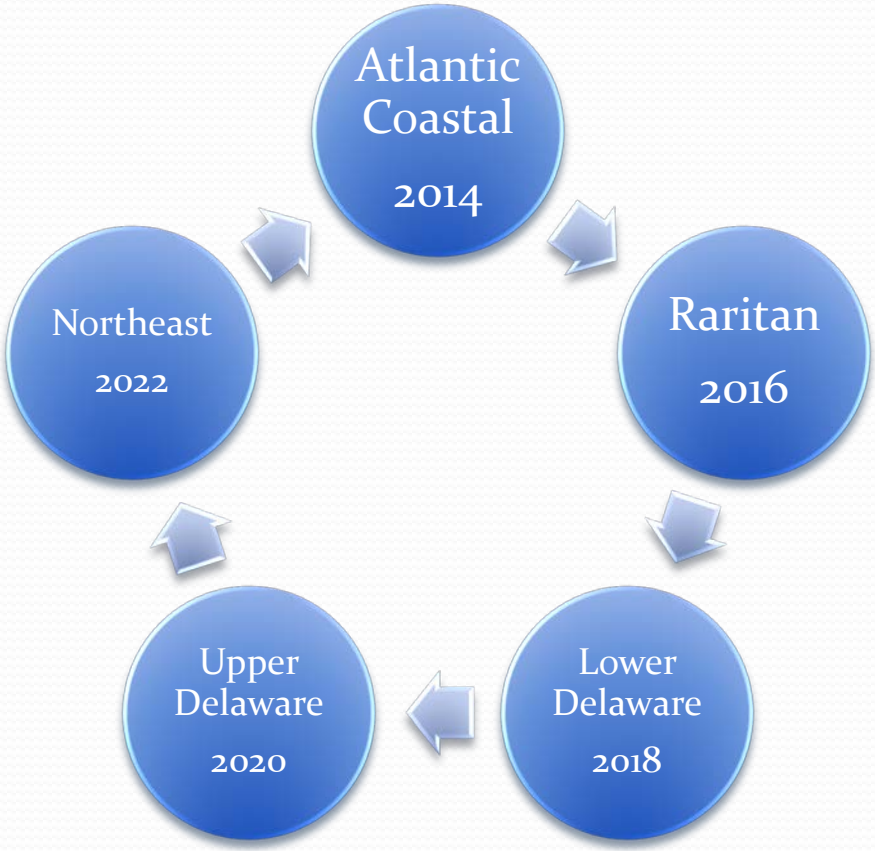
- Data level
  - Most straight forward process – comparison to criteria
  - Criteria based on water classification
  - Discrete and Continuous data
- Station level
  - Number of samples
  - Number of exceedances, percent exceeds
  - Min/Max values
  - Compare previous data results and notes
- HUC14 level
  - Number of stations, list of stations
  - Assessment results for each station
  - Worst-case decision
  - Compare previous data results and notes
- Designated Use
  - Assignment of parameters to designated use
  - Aquatic Life Use (general and trout), Recreation, Water Supply, Shellfish Harvesting, Fish Consumption, Overall

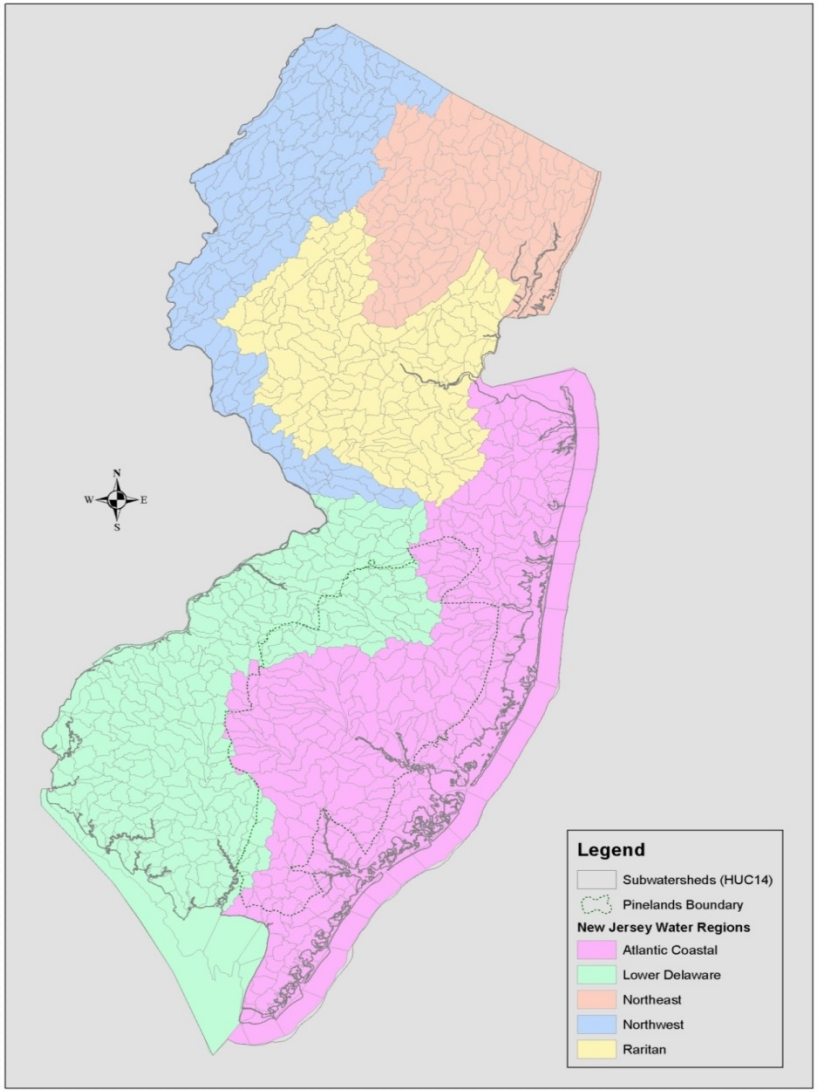






Rotating Basin Approach



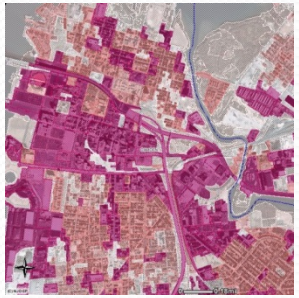


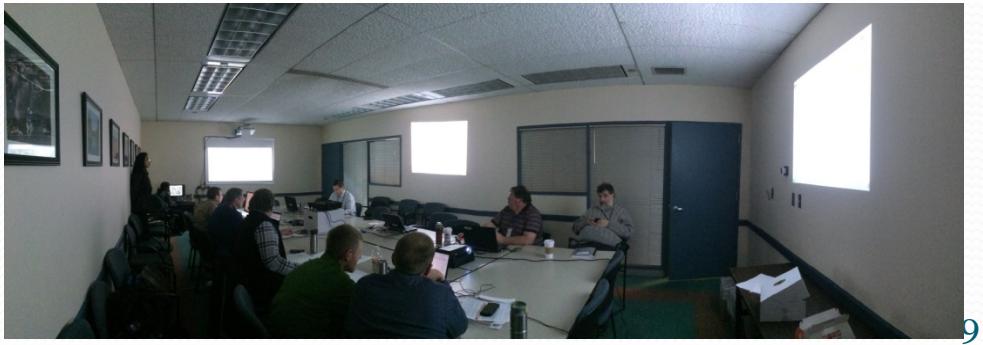
Primary Region vs Statewide

Primary Region	Other Regions
• All data undergoes a comprehensive QA process	• All data undergoes a comprehensive QA process
• 5 years of data and historical data	• 5 years of data only
• Evaluate all sampling stations with data that meet the minimum sample size[1]	• Evaluate sampling stations that meet the new target sample size[1]; otherwise, use the final assessment from previous assessment
• Complete a comprehensive assessment by incorporating all available lines of evidence for the entire region	• Complete a comprehensive assessment on a case-by-case basis for a specific, geographically limited area where warranted
• Update the assessment of designated use support for all uses	• Update designated use support assessment only where there are new assessments

Comprehensive Assessment

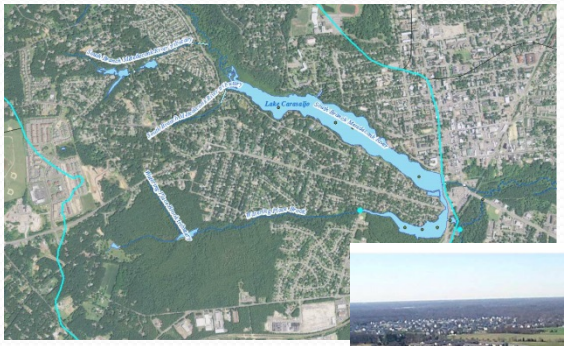
- Water quality and biological data don't tell the whole story
- Comprehensive Assessment – what is it?
  - Team of Professionals– the more the better (need the right expertise)
  - Other lines of evidence need to be incorporated to get the "big" picture and validate results
  - GIS is the best tool available





Other Lines of Evidence

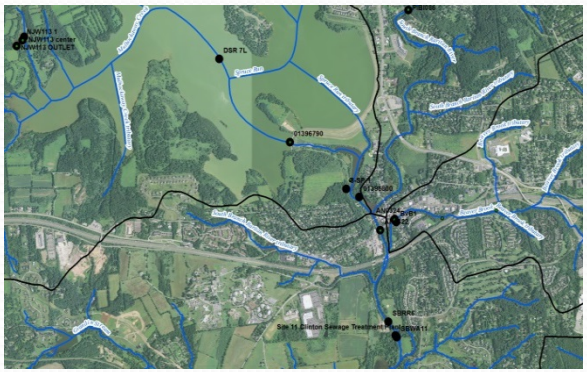
- Land use
- Hydrology
- Point sources
- Nonpoint sources
- Aerial photography
- Geology
- Weather information
- Biological habitat conditions
- Restoration activities
- Other Information and knowledge



Comprehensive Assessment Process

(Part 1 of 3)

- Other lines of Evidence
  - What is the location of the station?
  - What is the hydrography?
  - Is it deminimus?
  - What are the land use?
  - What does the imagery tell us?



Comprehensive Assessment Process

(Part 2 of 3)

- Other lines of Evidence
  - Where are possible pollutant sources?
  - What are stations showing upstream and downstream?
  - Conflicting stations which one is right?
  - Tidal influences?

Comprehensive Assessment Process

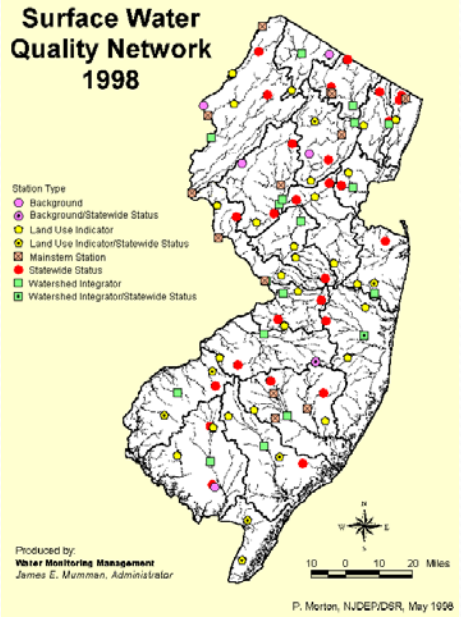
(Part 3 of 3)

- Other lines of Evidence
  - Where are the restoration activities?
  - Is it natural conditions?
  - What is the geology?
  - What is the biological habitat conditions?
  - Pinelands?

  - What were the weather conditions?

Comprehensive Assessment Results

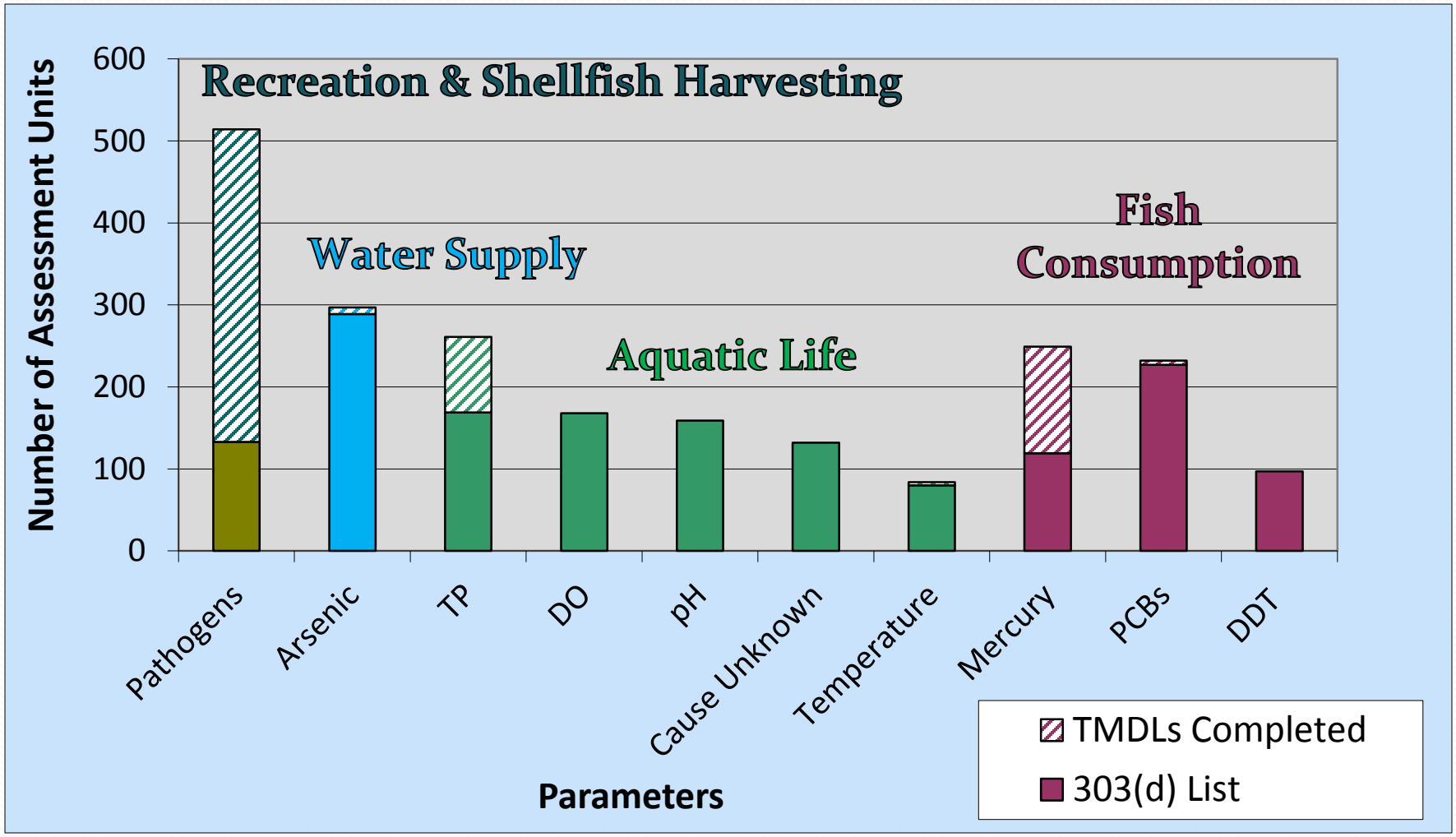
- Outcomes
  - Updated assessment results – higher confidence
  - Identify monitoring gaps – more data or new locations
  - Identify potential pollutant sources
  - Identify possible restoration efforts



Raritan Region

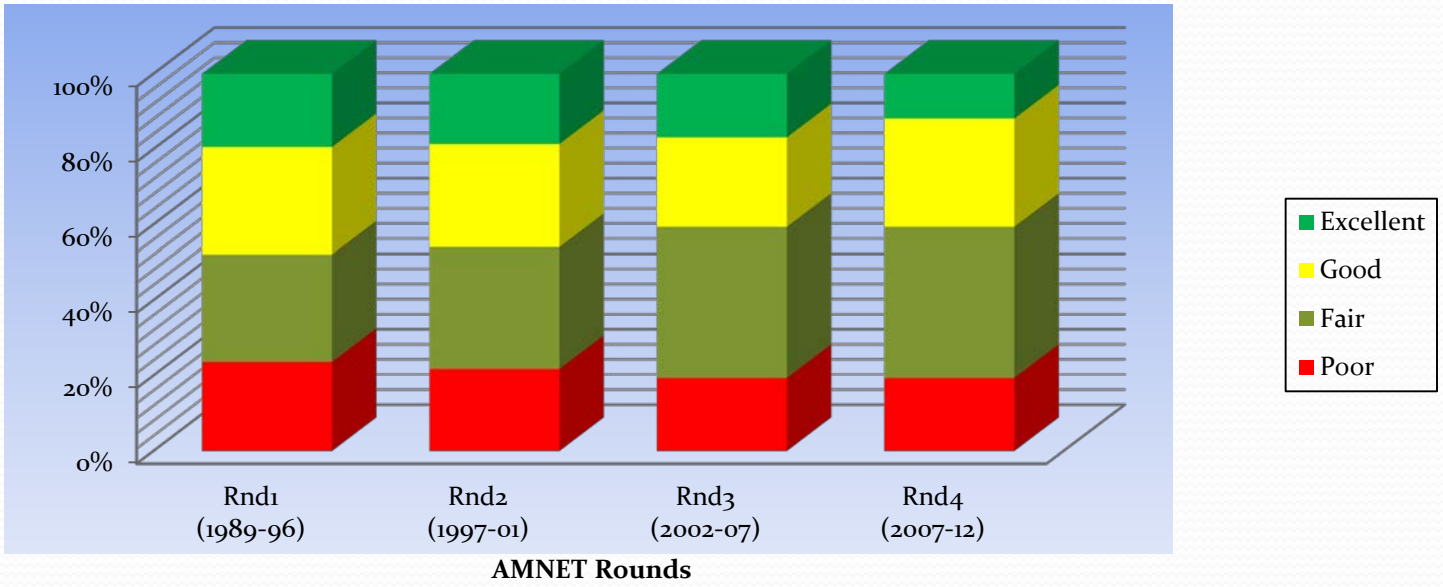
2014 Assessment Results

2014 Top Ten Causes of Use Impairment



AMNET Results in the Raritan Region

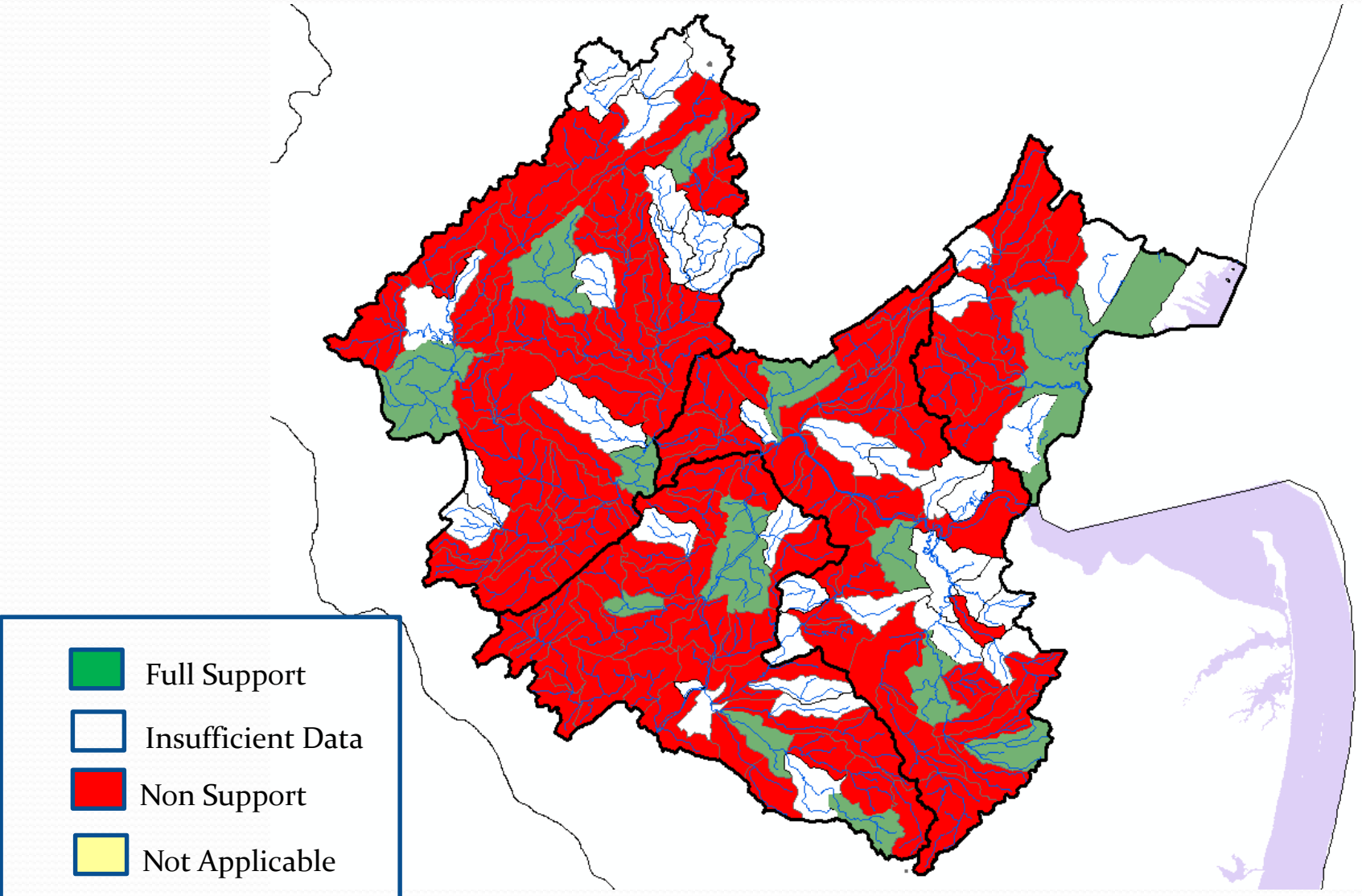
The Raritan Region showed results similar to the statewide trend, with a steady increase in "Fair" results accompanied by an overall decrease in the number of "Poor" sites and a decrease in the number of "Excellent" stations. The number of "Good" stations remained stable throughout the time period.



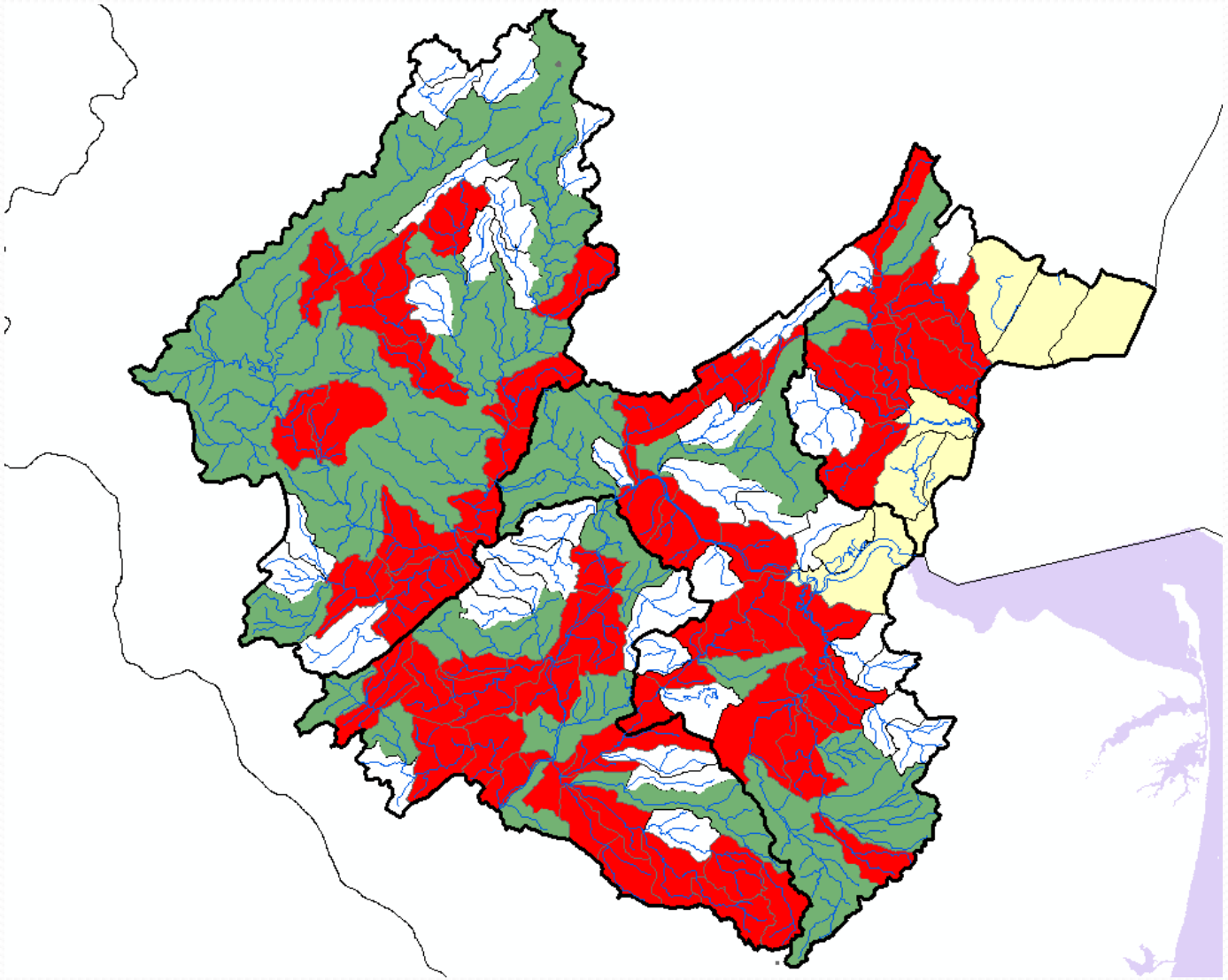
Increasing Chlorides and TDS

- Found in all types of land uses (urban, agricultural, mixed, and undeveloped) and physiographic regions.
- Associated with runoff from urban and agricultural areas -especially runoff of salt used to control ice on roadways.
  - Winter storm-related data supports a correlation between road salting and increased TDS levels in the water column.
  - Numerous occasions of excessive TDS concentrations as well as chlorides that coincide with winter storm events
  - The number of chloride exceedances resulting in use impairment remains relatively low.

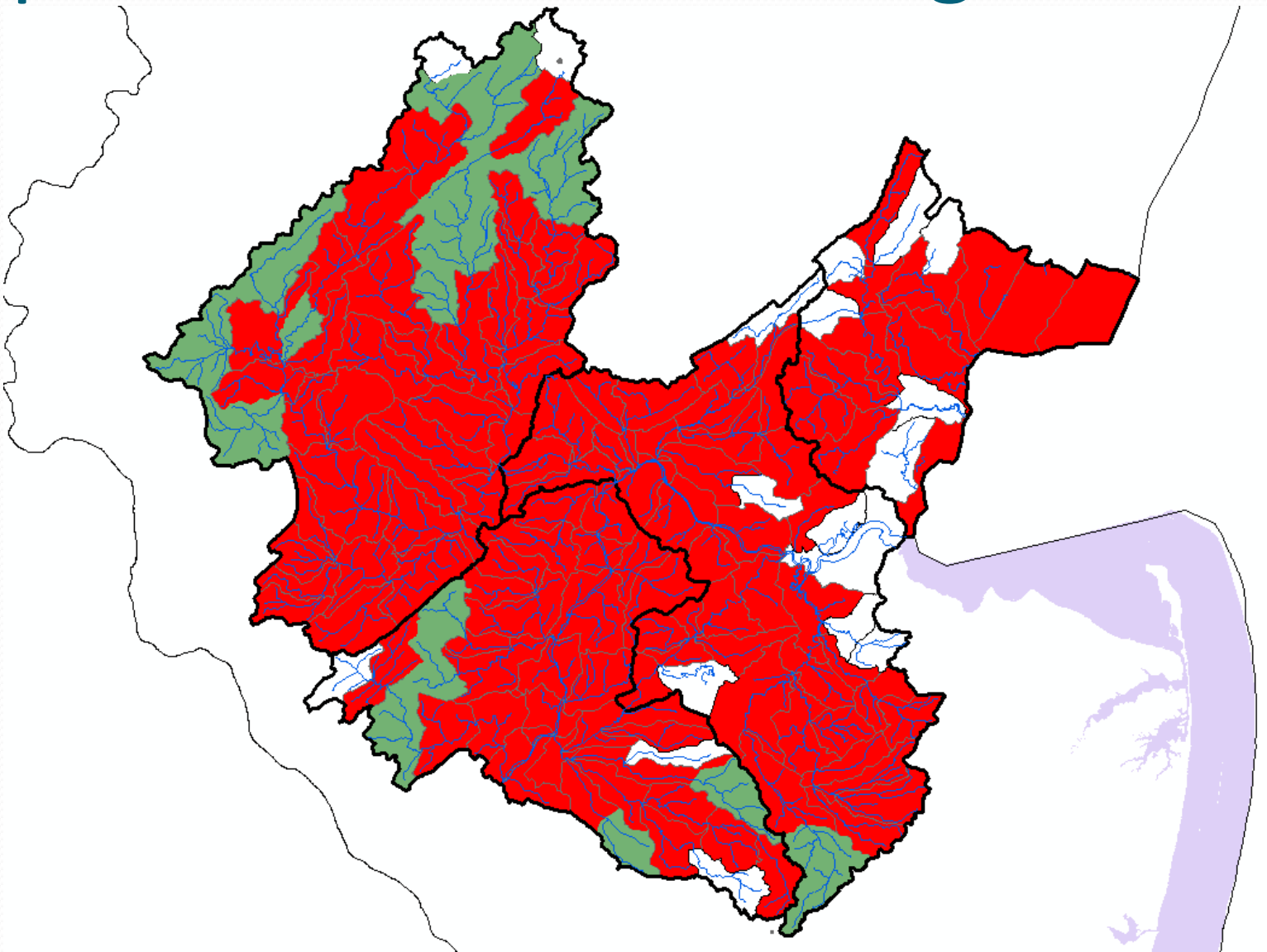
Recreation Designated Use



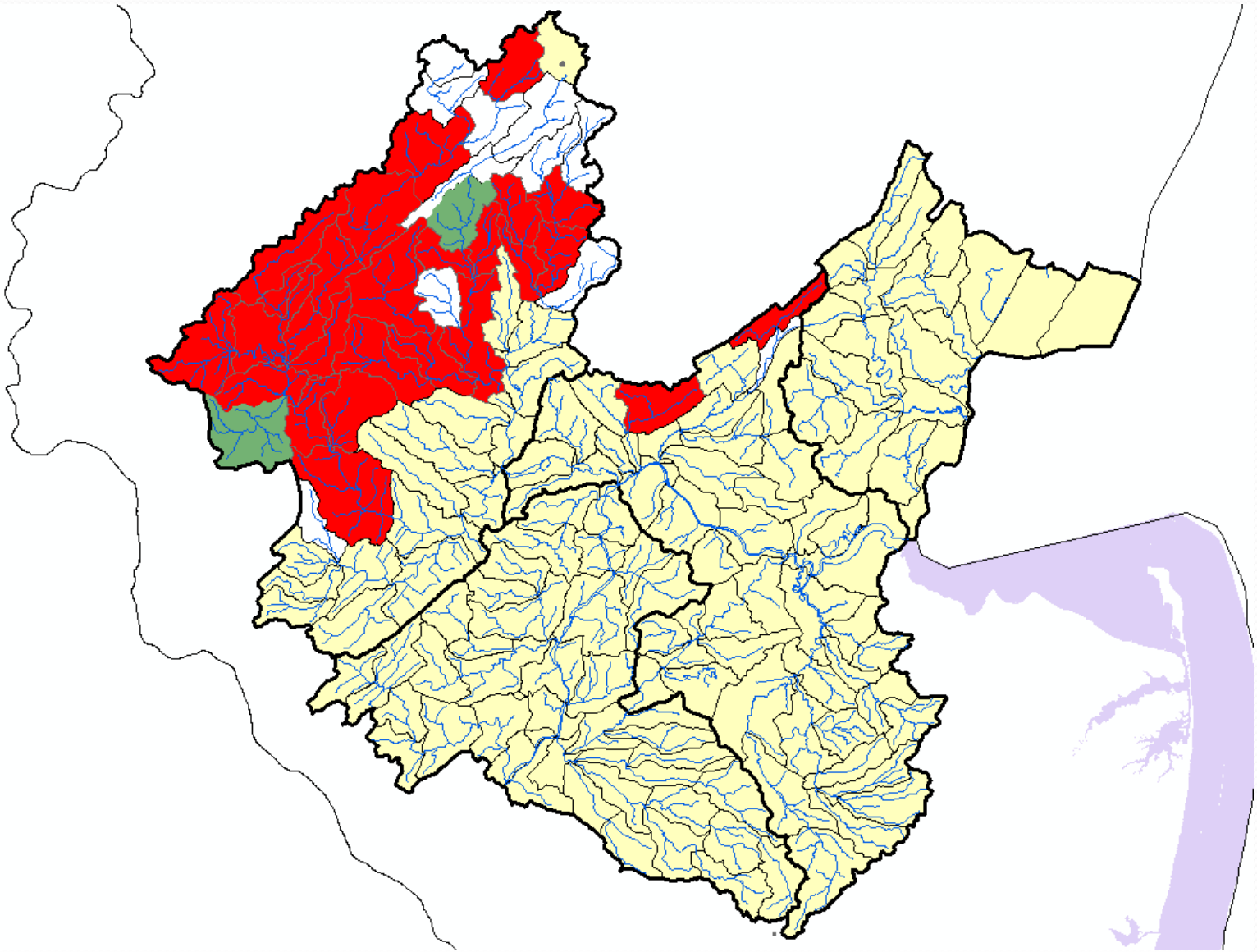
Drinking Water Designated Use



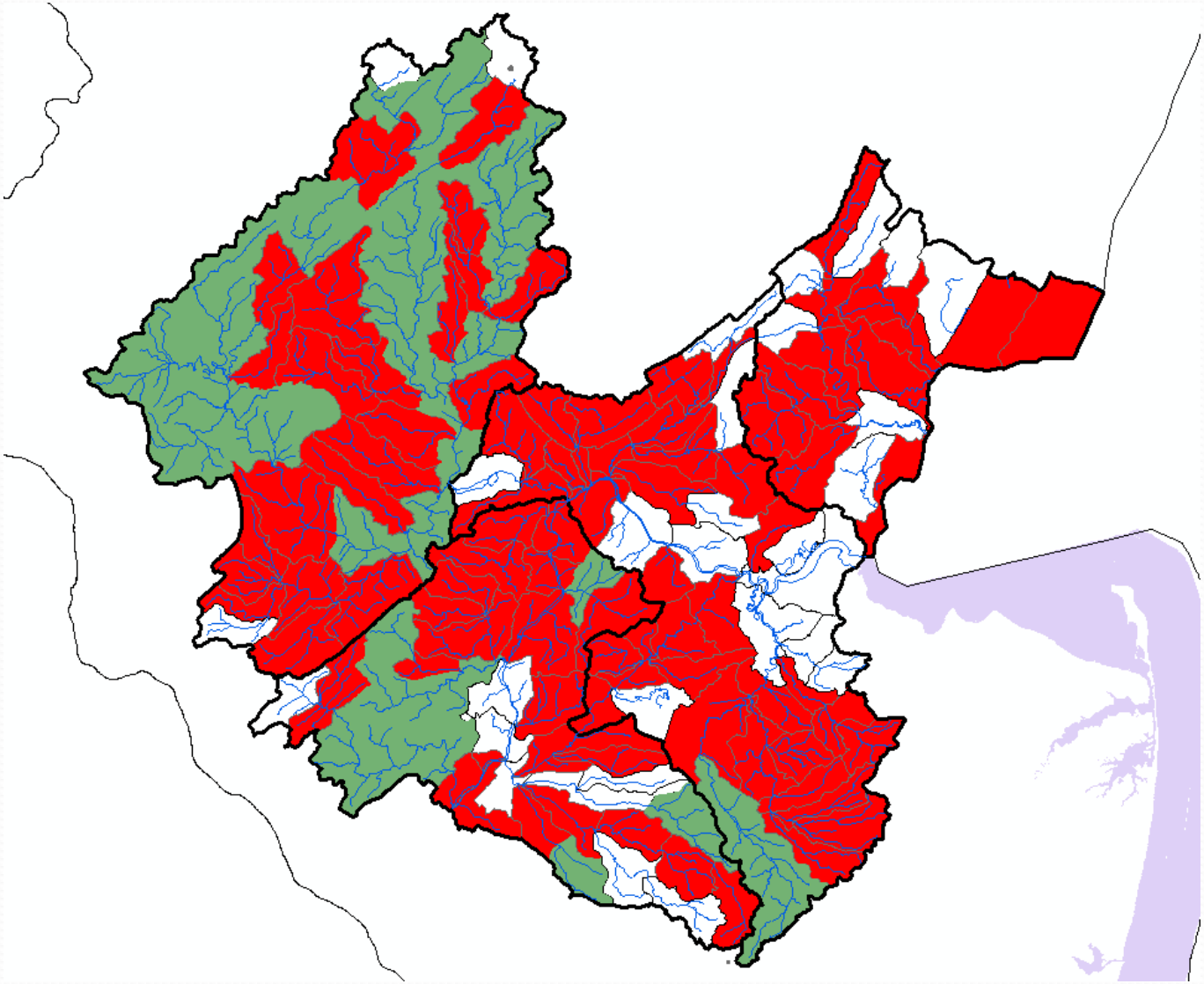
Aquatic Life General Designated Use



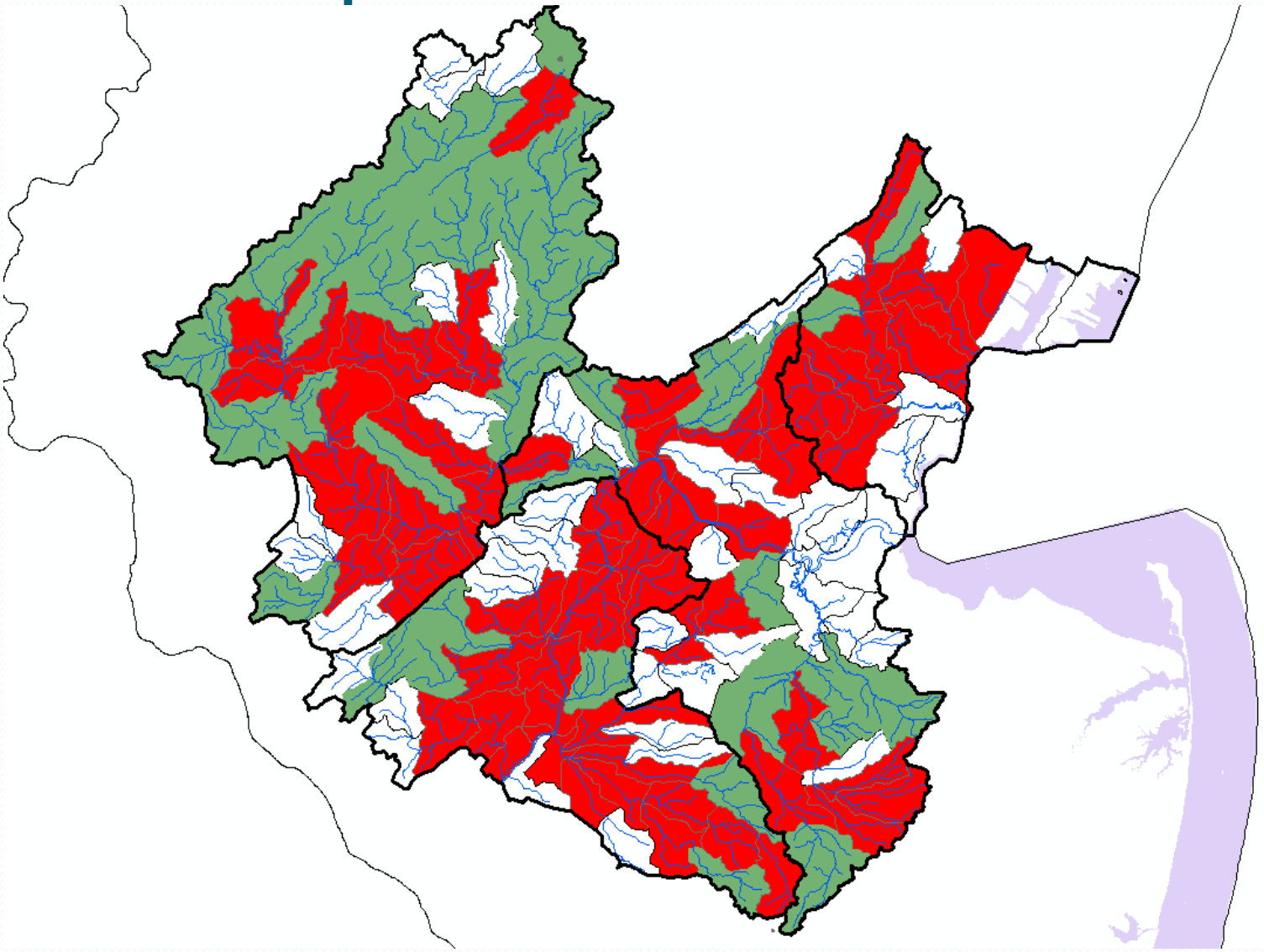
Aquatic Life Trout Designated Use



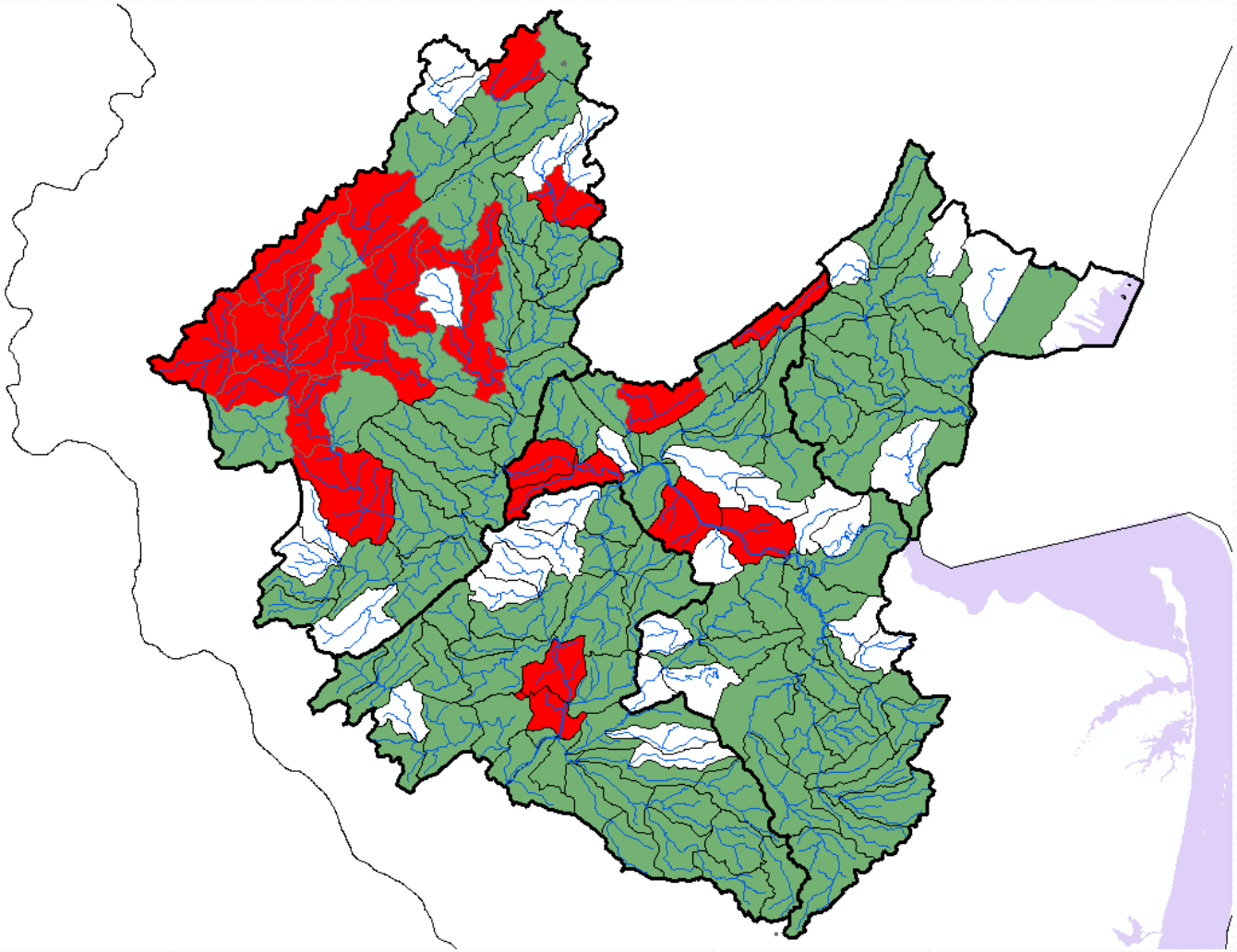
Biological Assessment Results



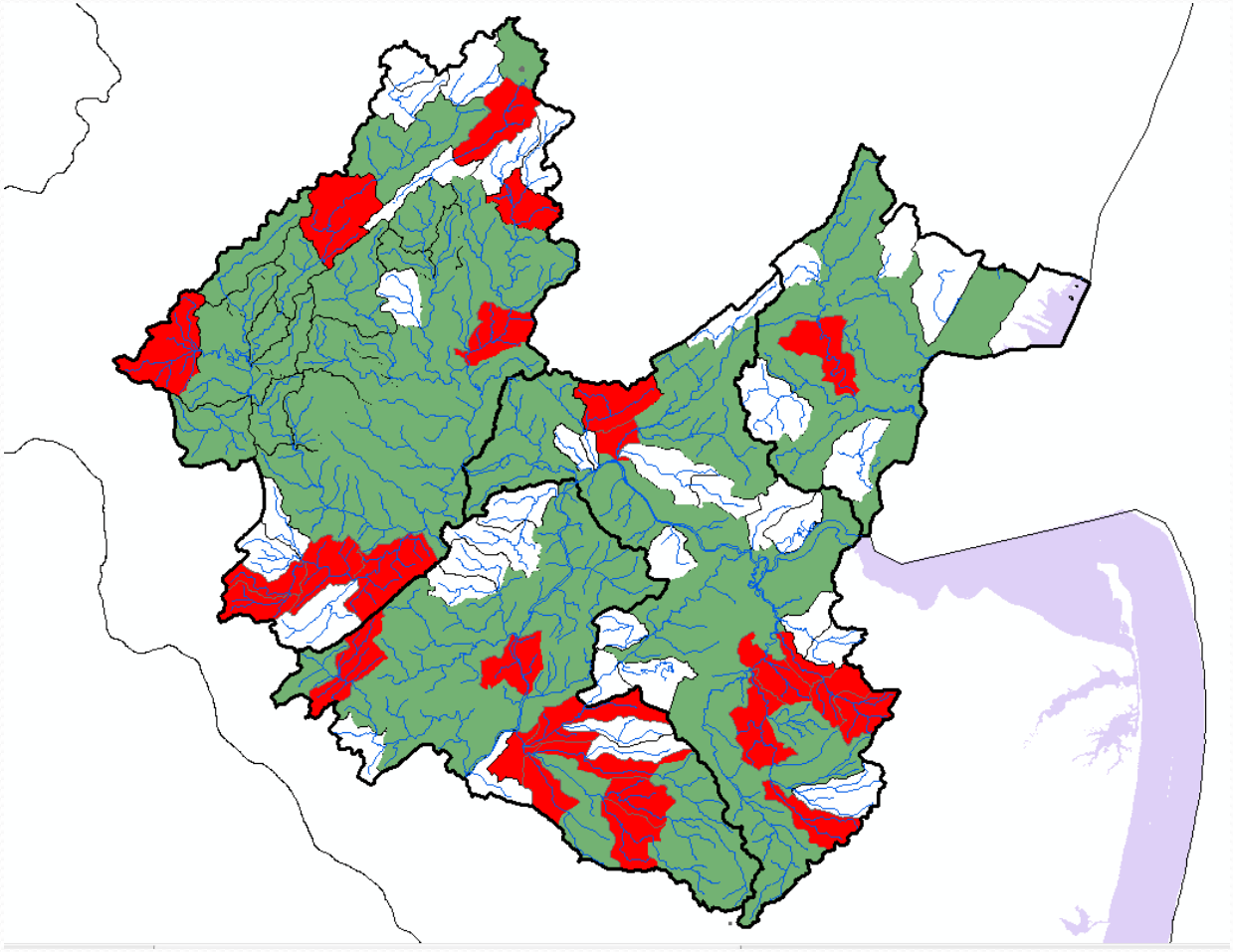
Total Phosphorus Assessment Results



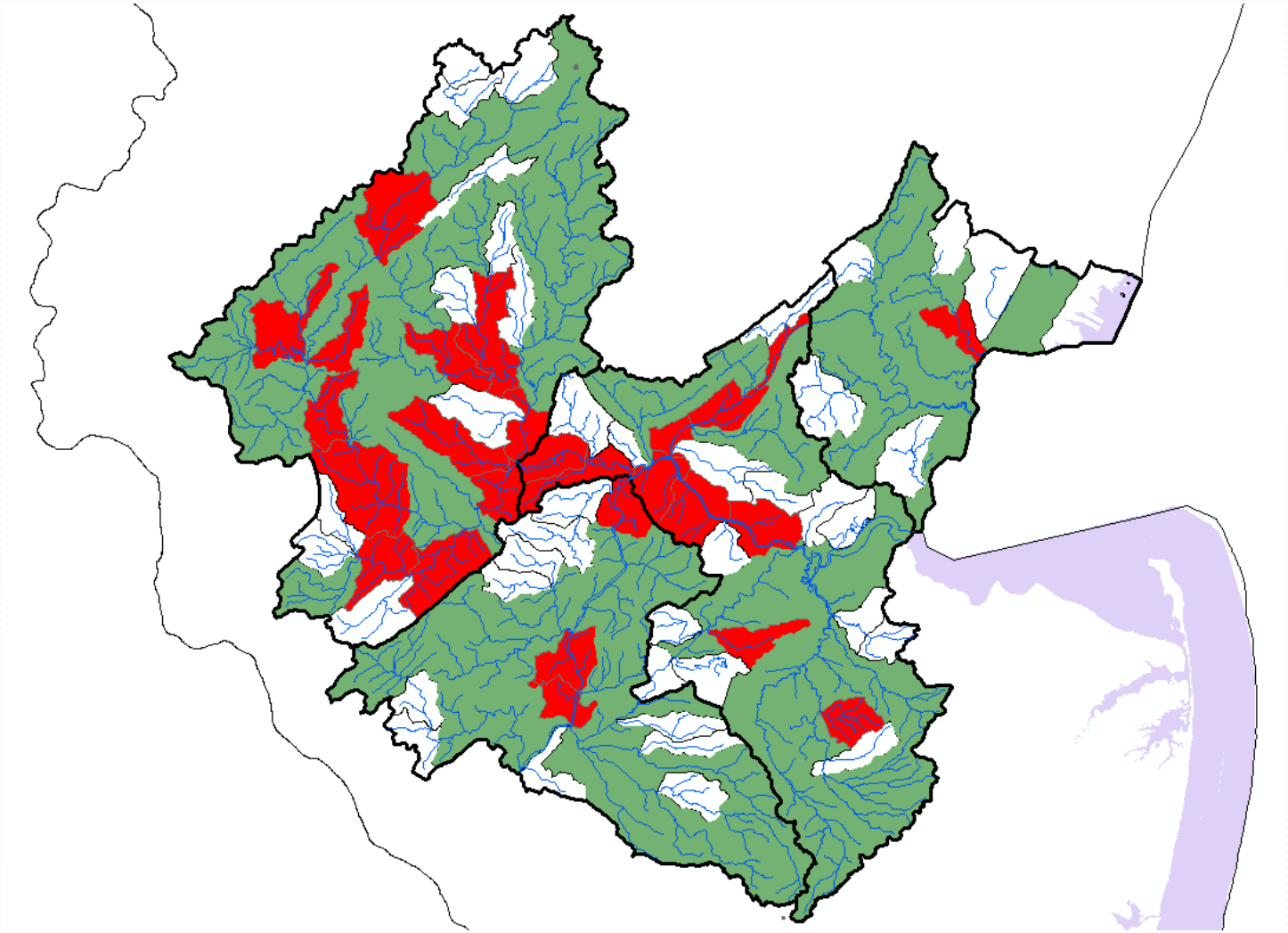
Temperature Assessment Results



Dissolved Oxygen Assessment Results



pH Assessment Results



For more information:

http://www.state.nj.us/dep/wms/bears/assessment.htm

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Possible Restoration Efforts

WMA	Name	Restoration
08	Drakes Brook (above Eyland Ave)	Maybe 319 candidate.
08	Holland Brook	Bank stabilization, riparian restoration, green infrastructure for stormwater. Candidate for streambank resoration.
08	Peapack Brook (above/incl Gladstone Bk)	Package Plant may have been upgraded
08	Pleasant Run	Bank stabilization, riparian restoration, green infrastructure for stormwater. Candidate for strean bank restoration. Possible AmeriCorp partnership.
08	Pottersville trib (Lamington River)	Riparian restoration at bottom part of HUC
08	Raritan R NB (incl McVickers to India Bk)	Mendhem WWTP impacting NB15
08	Raritan R NB (Peapack Bk to McVickers Bk)	Riparian restoration
08	Raritan R NB (Rt 28 to Lamington R)	bank restoration-Chambers Bk abv Sunset Lake. Cow farm fencing to prevent access to stream possible

Possible Restoration Efforts

09	Deep Run (above Monmouth Co line)	any restoration done in this HUC???? AMNET sites at AN0453A and 01405960 show unstable streambanks - restoration candidates?? Good candidate for streamwalk to find source for TP
09	Deep Run (Rt 9 to Monmouth Co line)	Maybe good candidate for trash education, GI stormwater. AN0453 show unstable streambanks - restoration candidate??
09	Green Bk (Bound Bk to N Plainfield gage)	Streambank restoration, GI stormwater
09	Green Bk (N Plainfield gage to Blue Bk)	NPS Permits enforcement.
09	Lawrence Bk (Milltown to Church Lane)	GI stormwater, good candidate since downstream sites is fully attaining for nutrients
09	Manalapan Brook (above 40d 16m 15s)	GI Stormwater
09	Manalapan Brook (below Lake Manalapan)	GI stormwater
09	Matchaponix Brook (below Pine Brook)	Streambank restoration at AN0450, airport upstream. AMNET site (AN0451) is candidate for stream restoration (need to stabilize stream banks).

Possible Restoration Efforts

09	Middle Brook EB	GI stormwater, Golf Course nutrient plan & runoff. Followup with DWQ around AN0418 for TDS source.
09	Oakeys Brook	GI stormwater
09	Peters Brook	Check on restoration work (bank stabilization and golf course restoration)
09	Weamaconk Creek	runoff from mall and racetrack. Americorp pathogen track down candidate
10	Beden Brook (above Province Line Rd)	possible stream restoration candidate
10	Cruser Brook / Roaring Brook	Quarry
10	Millstone R (BlackwellsMills to BedenBk)	GI stormwater
10	Rocky Brook (below Monmouth Co line)	BFBM00000221 with very high E.Coli geomean target for restoration