State Approaches to Permitting for Nutrients

REGION 10 STATES MEETING

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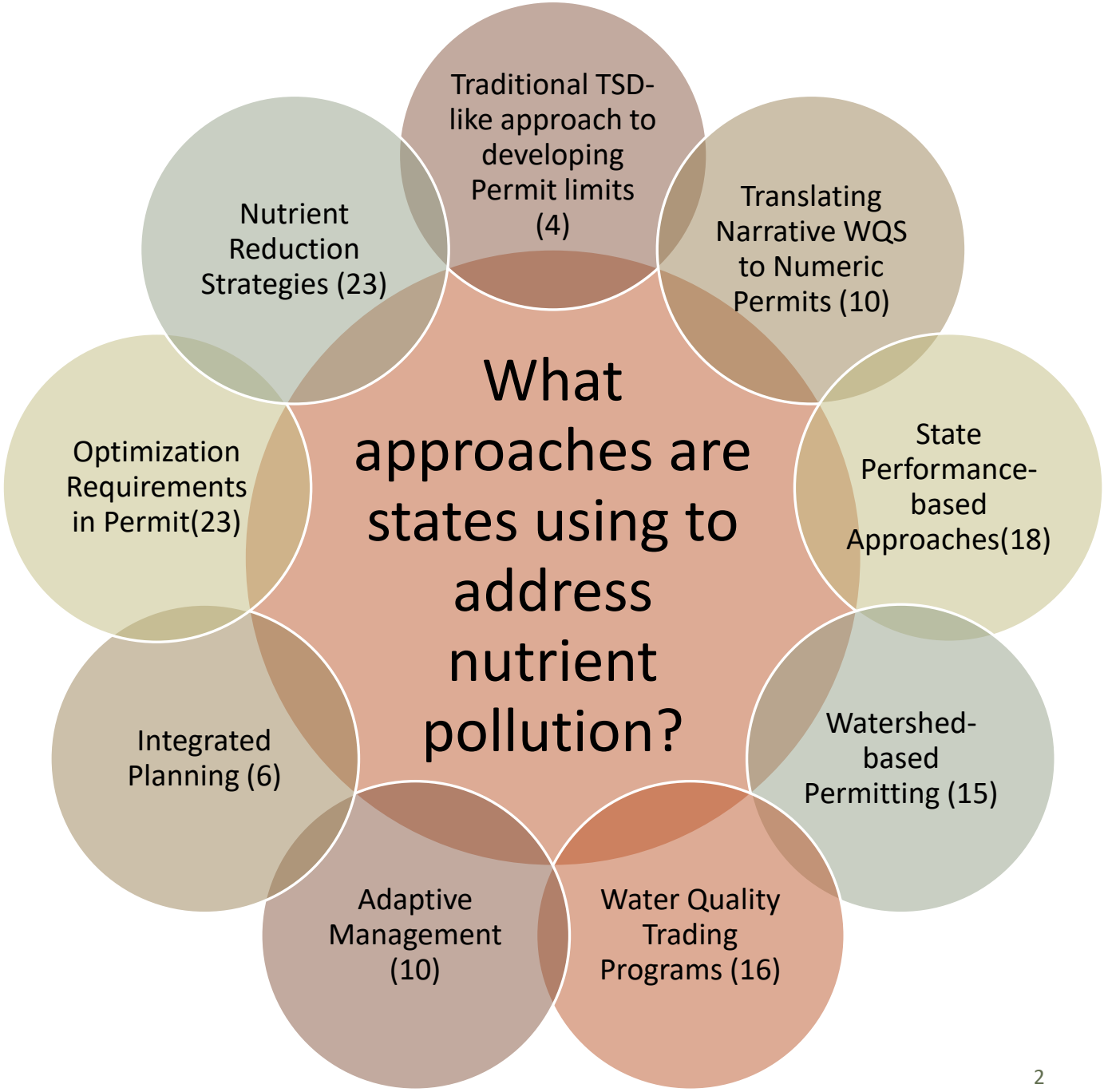
State approaches to nutrient pollution controls



State approaches to addressing nutrient pollution in nutrient compendium

State	Traditional TSD-like approach	Performance Based Approach	Water Quality Trading	Watershed-Based Permits	Translating narrative criteria	Adaptive Management	Integrated planning	Nutrient reduction strategies	Optimization Requirements
Alabama		x							
Alaska									
Arizona					X				
Arkansas								X	
California			x	X	X	X		X	X
Colorado	x	x	x	X				X	X
Connecticut			x	X	X			X	
Delaware		x							
Florida			x						
Georgia		x						x	X
Hawaii									
Idaho	x		x		X				X
Illinois								x	X
Indiana		x						x	X
Iowa		x						x	X
Kansas							X	x	X
Kentucky								x	X
Louisiana			x					x	
Maine									
Maryland			x	x					
Massachusetts					X	x	X		X
Michigan		x		X		x		x	
Minnesota	x	x	x			X		x	X
Mississippi								x	
Missouri		x					X	x	X
Montana									X
Nebraska									
Nevada						X			
New Hampshire				x		X			X
New Jersey		x							

State approaches to addressing nutrient pollution in nutrient compendium

State	Traditional TSD-like approach	Performance Based Approach	Water Quality Trading	Watershed-Based Permits	Translating narrative criteria	Adaptive Management	Integrated planning	Nutrient reduction strategies	Optimization Requirements
New Mexico				X				x	
New York		x							
North Carolina		x	x	X		x		x	
North Dakota								x	
Ohio		x	x	X		x	x	x	
Oklahoma									X
Oregon			X	X				x	
Pennsylvania		x	X						
Rhode Island				X	X				X
South Carolina									X
South Dakota									
Tennessee		x						x	X
Texas		x		X					
Utah					x				X
Vermont				X		x			X
Virginia		x	X	X			X		X
Washington			X	X			X		X
West Virginia					X				
Wisconsin	x	x	X	x		X		x	X
Wyoming								x	
Total	**4**	**18**	**15**	**16**	**9**	**10**	**6**	**23**	**23**

Notes about this table:

- *Columns in **black** are part the Compendium of State and Regional NPDES Nutrient Permitting Practices, released in April 2022.*
- *Columns in purple have been confirmed by States/Regions. These 5 additional compendium chapters will be released in 2025.*
- *This may not be a complete list. Not all states chose to be included in the compendium.*

Wisconsin's approach to addressing Phosphorus

History of Wisconsin's approach

1996- 2000 – **State performance-based** requirement – 1 mg/L TP in all major WWTP

2001 – Begins **modeling effort to determine numeric thresholds** for TN and TP

2010 – tightens performance-based standards and **adopts numeric TP WQS**

- Criteria range 5 ug/L to 100 ug/L
- Includes various option for compliance

2012 – WQBELs begin getting put in permits

2013 – develops nutrient reduction strategy

2019 – 21 facilities with approved adaptive management plans

Point Source Implementation:

Permit limits for TP either from TMDL or calculated using a mass balance approach

- range from 0.04mg/L – 1 mg/L

Options available for meeting Limits:

- **Compliance schedules** (7-9 Year compliance schedules)
- **Water Quality Standards Variances** (74 facilities)
  - Multi-discharger WQS Variance
- **Adaptive Management** (21 facilities)
  - permit limit =.5 mg/l and factors in reductions in NPS. If NPS reductions don't' occur, more stringent limit kicks in
- **Watershed-based permitting** (4 watershed)
- **Water quality trading** (43 facilities)

Monitoring requirements for TN while continue to study the impacts of TN

Region 1 approach to address in Nitrogen in the New Hampshire

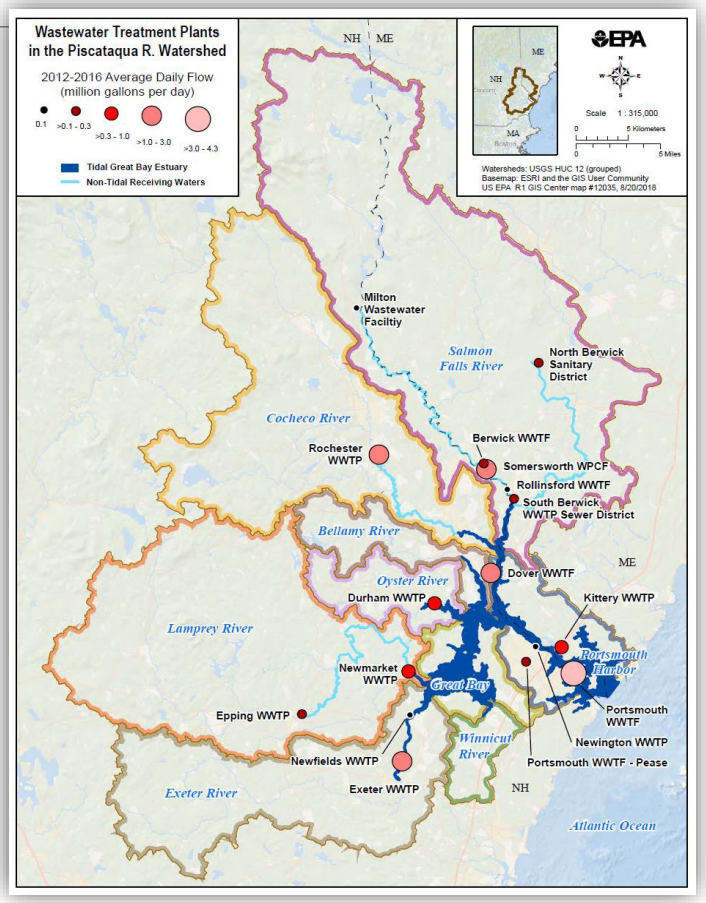
Great Bay Estuary impaired for Low dissolved oxygen, algal blooms, and declining eelgrass habitat and oyster communities due to high nitrogen loads, but No TMDL has been developed

Region 1 developed a range of threshold to be used to **model a variety of scenarios** that would meet the **narrative criteria** for nitrogen

- EPA selected a maximum threshold to protect water quality standards (100 kg ha^{-1} yr^{-1} nitrogen loading threshold)

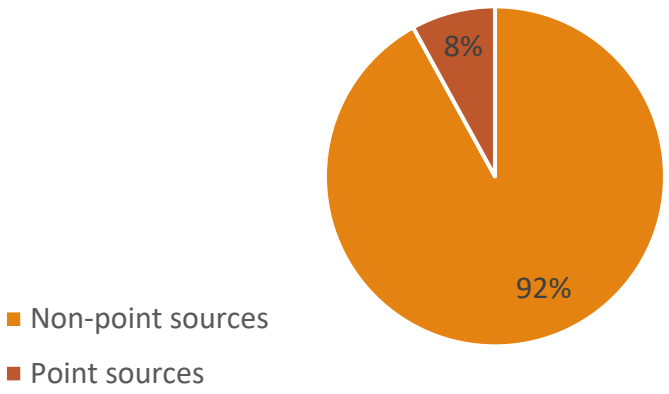
In November 2020, EPA issued a **watershed-based general permit** for discharges of nitrogen from 11 WWTFs.

- Coverage under the GP was optional (total of 13 dischargers in the watershed)
- Includes rolling seasonal loading limits in lbs/day
- **Optimization** requirements
- Includes **adaptive management** approach to leverage NPS reductions (10 municipalities have submitted their plans to date)

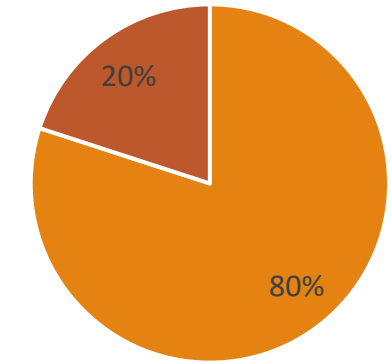


Iowa approach to addressing nutrient pollution

Sources of TN in Iowa

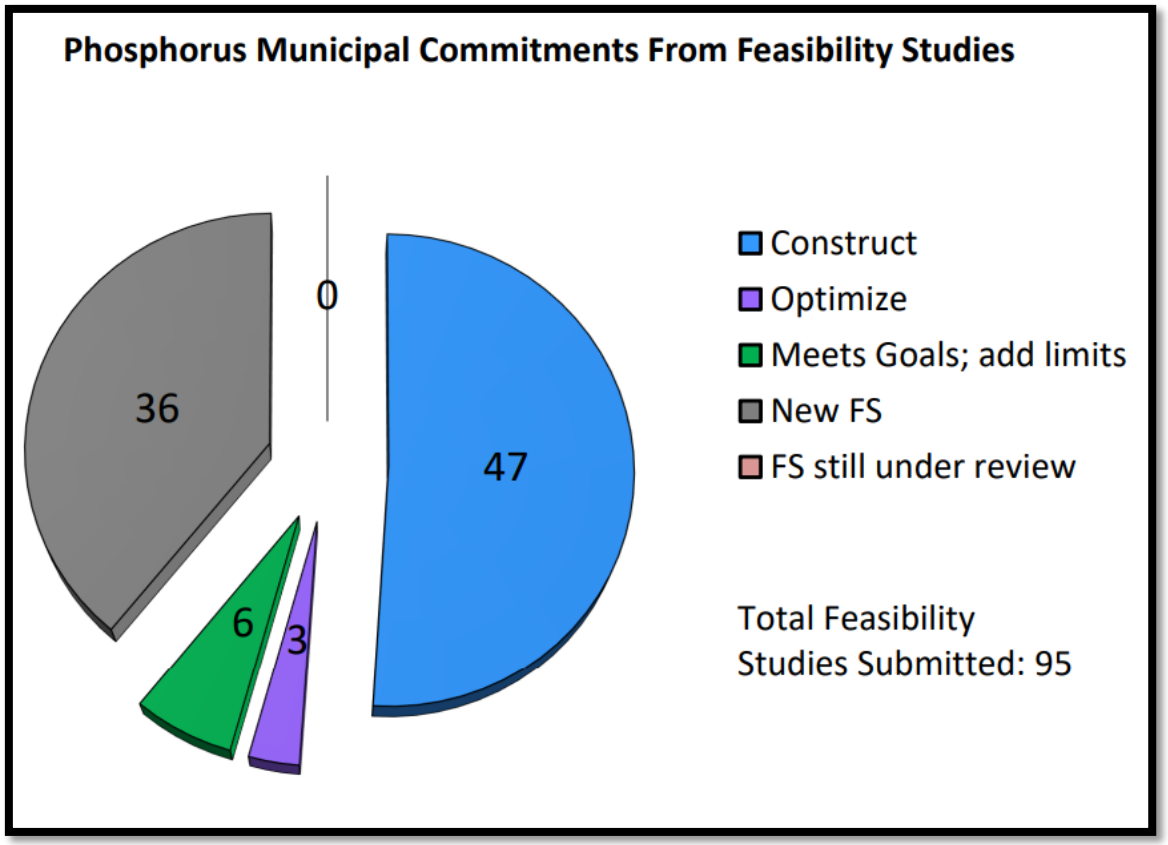


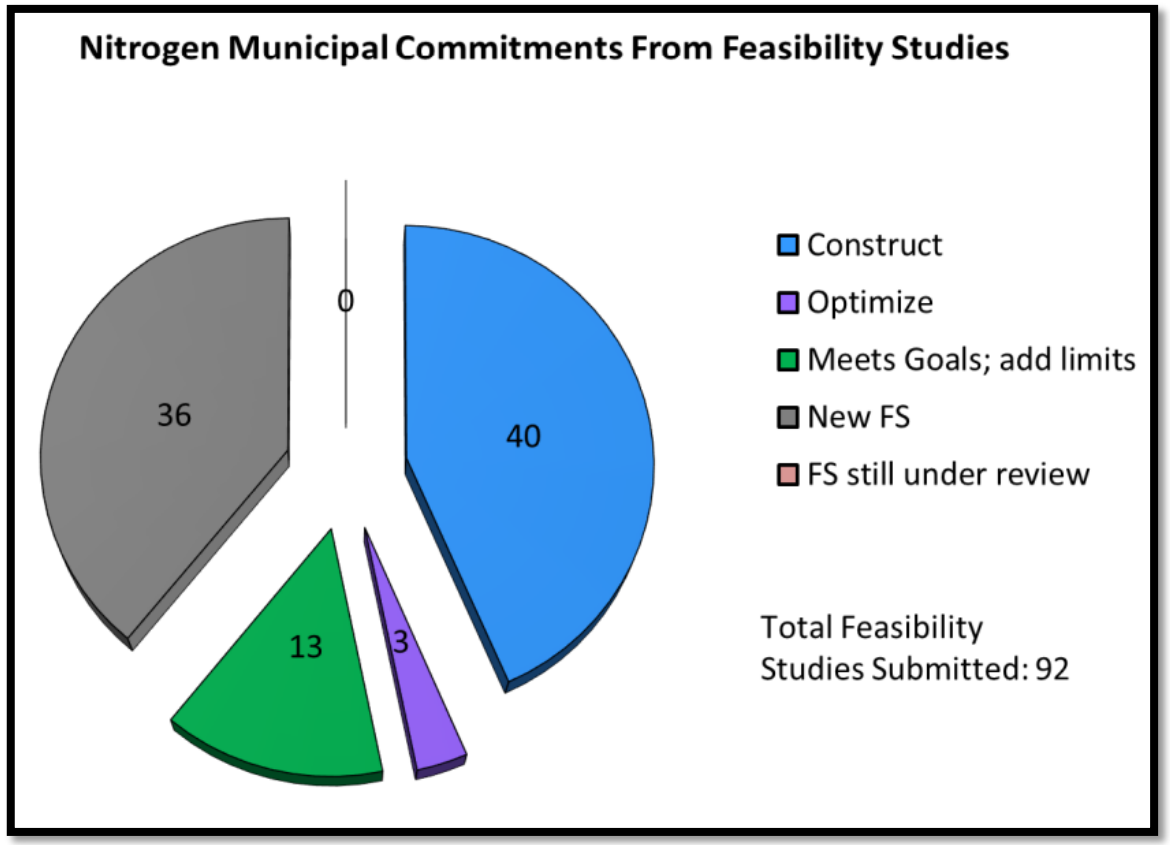
Sources of TP in Iowa



- Reductions driven by the **Mississippi River/Gulf of Mexico Hypoxia Task Force**
  - 2008 Gulf Hypoxia action plan call for states to reduce 45% riverine TN and TP by 2035.
  - Gulf hypoxia States agreed to interim goal of 20% in statewide loads by 2025 .
- In response, Iowa developed **Nutrient Reduction Strategy**
  - Strategy's goal to reduce 45% TP and TN contributions statewide with a plan for both NPS and PS reductions
  - **Point source strategy**:
    - Target statewide PS reductions: 4% reductions in N, and 16% reductions in P **permits required a feasibility analysis** requirements aimed at how facilities will reach the reduction goals
    - **Performance-based** approach
      - To achieve BNR equivalent nutrient removal at each plant where TN removal ~66% and TP removal ~75%
      - Roughly equivalent to TN (10 mg/L) and TP (1 mg/L) limits
  - **Non-point source strategy**:
    - Target statewide NPS reductions: 41% reduction in N, and 29% reduction in P
    - Relies on developing **strong partnerships with agriculture** and focuses on conservation practices, infield and off field practices, and nutrient trading programs.

Results of IA Feasibility Studies for Municipalities





Other Notable approaches

Virginia Chesapeake Bay watershed

- **Performance-based** approach in some watersheds ahead of TMDL
- **Watershed approach:** Chesapeake bay watershed **model** (driven by DO criteria) and **TMDL** set Numeric loading targets for major tributaries in the Bay watershed
- **Watershed-based permit**
  - Annual loading limits for TN and TP
  - Ambient monitoring
- **Water Quality Trading** and Nutrient Credit Exchange Association to facilitate trades

Massachusetts and Rhode Island addressing Nutrient pollution in Narragansett Bay watershed

- **Translation on Narrative Criteria**:
  - Use **gold book**, The Marine Ecosystem Research Laboratory (MERL) **model** and Narragansett Bay **studies** to set numeric targets for TN and TP in the watershed to meet narrative standard.
- Permit limits for Major WWTP
  - Total Phosphorus: 1 to .1 mg/L
  - Total Nitrogen: 3 to 8 mg/L

Other Notable approaches

Connecticut - Total Nitrogen

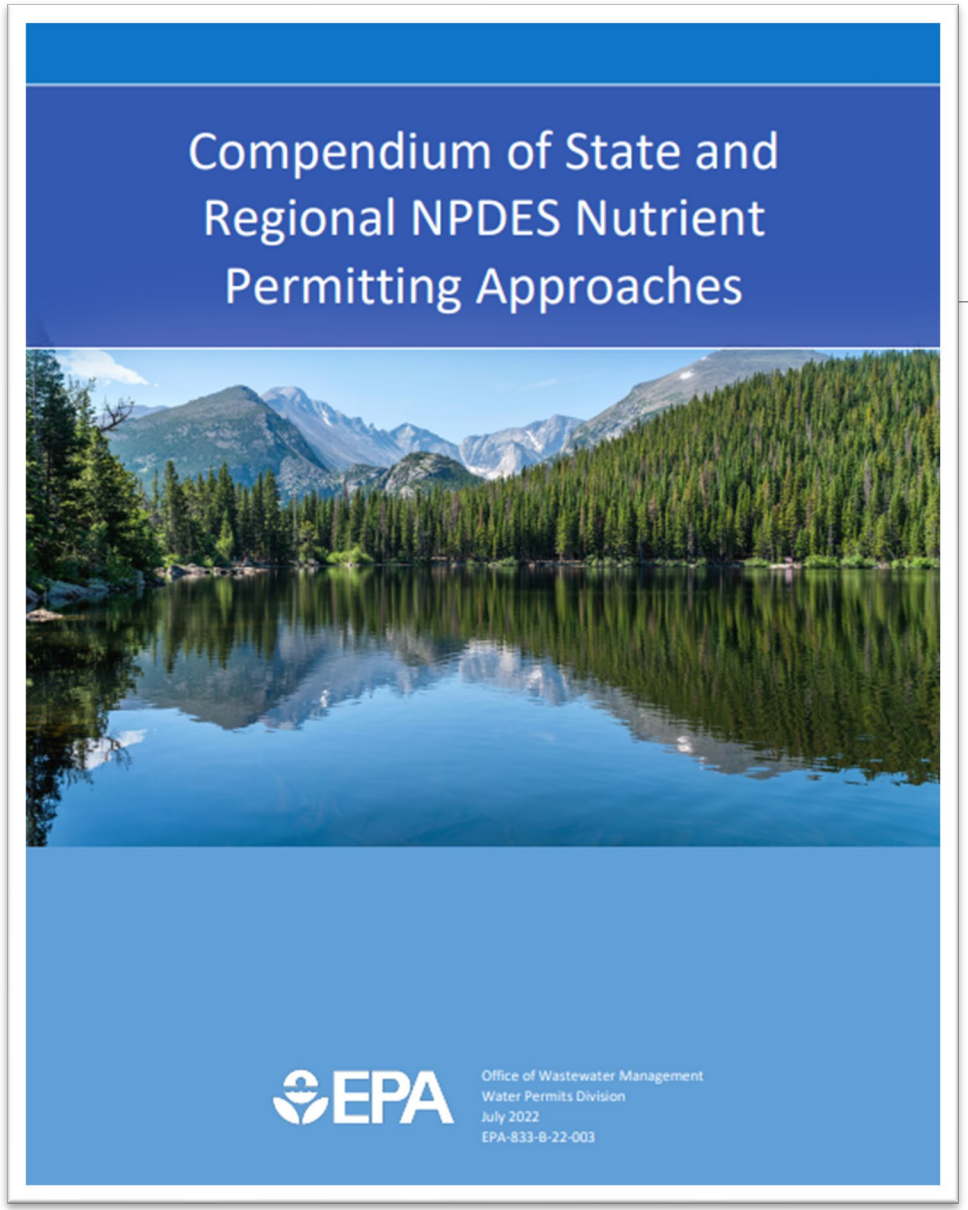
- **Watershed approach** to TN in Island sound watershed
  - **TMDL** for TN for Long Island Sound watershed
  - **Watershed-based Permitting** for State POTWs upstream of Bay
  - **Water Quality Trading** and Nitrogen Credit Exchange Program
    - Initially, managed and subsidized by the State
      - State bought and sold all credits
    - As facilities met their requirements, trading program transitioned to a more sustainable approach
      - sellers split the proceeds instead of state subsidizing the program

Connecticut - Total Phosphorus

- Connecticut also has a **Phosphorus reduction strategy** statewide, that is driving Numeric limits in permits for inland waters
  - Reductions based on state established “Enrichment factors”
  - Total Phosphorus limits
    - range from .1 to 2.5 mg/L
    - some facilities being capped at current loads.

Recent EPA Activities

IN THE OFFICE OF WASTEWATER MANAGEMENT (OWM)

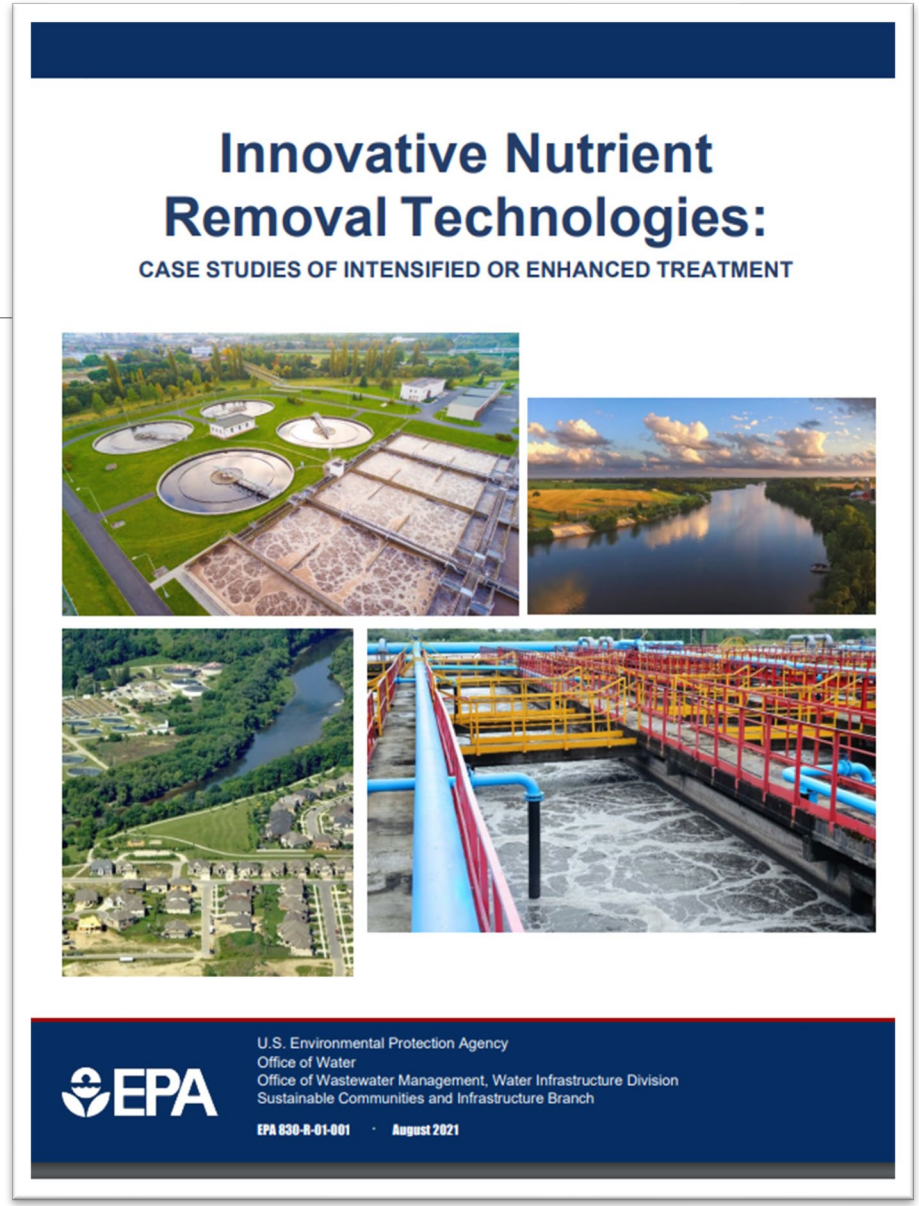


Compendium of State and Regional NPDES Nutrient Permitting Practices

- On April 11, 2022, EPA released and updated Part 1 of the Compendium of State and Regional NPDES Nutrient Permitting Approaches
  - Traditional TSD approach
  - Performance-based approaches
  - Watershed-based permitting
  - Water quality trading
- In 2025, EPA will release 5 new chapters of the compendium. Topics will include
  - Adaptive management
  - Nutrient Reduction Strategies
  - Integrated planning that include nutrient requirements
  - Permits with limits derived from narrative nutrient WQS (narrative WQS translation)
  - Optimization requirements in permits

Innovative Nutrient Removal Technologies

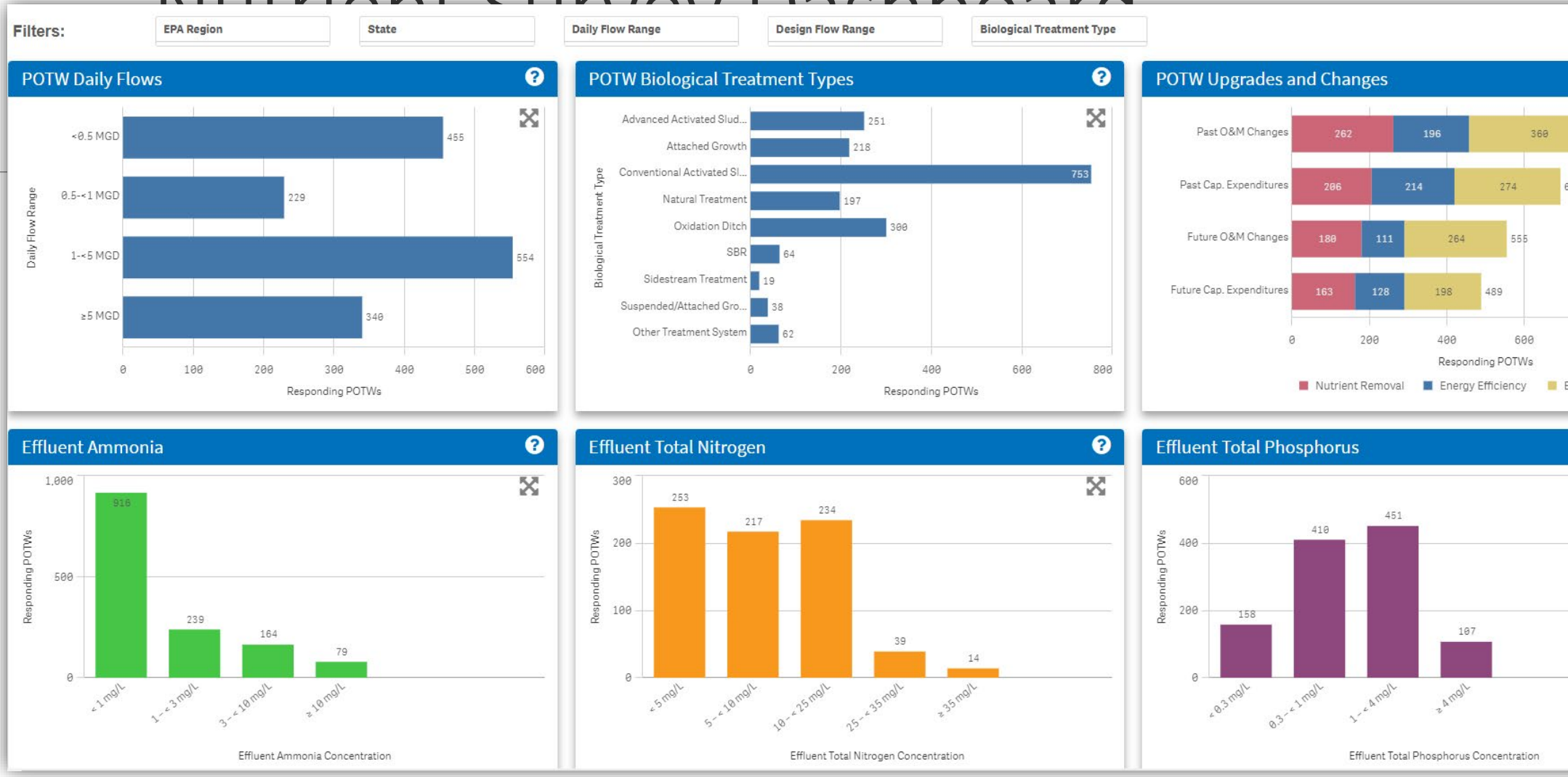
- Innovative Nutrient Removal Technologies: Case Studies of Intensified or Enhanced Treatment (pdf) -- EPA completed a study and report that analyzed the long-term performance of five facilities in the U.S. and one facility in Canada that implemented innovative technologies or process enhancements designed to significantly intensify treatment or enhance the removal of nitrogen or phosphorus species.



Searchable Clearinghouse of Wastewater Technology (SCOWT)

You can find a link to SCOWT here: [Searchable Clearinghouse of Wastewater Technology (SCOWT)]

Nutrient Survey Dashboard



You can find a link to the dashboard here: [Nutrient Survey Dashboard]

Additional Resources

Nutrient Permitting Webpage – EPA's webpage for permitting resources for NPDES permitting. It includes the following links:

- Watershed-based Permitting Website - EPA's website for current policy, guidance and case studies for Watershed-based permits across the country
- Water Qualtiy Trading Website - EPA's website for current policy and guidance for Water quality Trading
- NPDES Permit Writer's Specialty Training: Addressing Nutrient Pollution in NPDES Permits - online training course builds on the basic NPDES Permit Writers' Course, but adapts the concepts presented in that course to consider issues permit writers may face when permitting discharges of nutrients.

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