NEW ENGLAND WATER ENVIRONMENT ASSOCIATION
NEWEA
WORKING FOR WATER QUALITY

Session 5: Great Bay Total Nitrogen General Permit - Panel Discussion

Monday January 24, 2022
8:30 -10:30 am

Figure 1. New Hampshire coastal watershed communities.
Map provided by the Piscataqua Region Estuaries Project (PREP).

Great Bay Estuary

Major Tidal Estuary = ~ 1,000 Sq. Mi; includes 52 Communities in NH and Maine

17 Wastewater Treatment Plants in the Watershed; 13 NH & 4 in Maine

Diverse Ecosystem of Marine Fisheries, Waterfowl and Terrestrial Wildlife

Major Economic Resource for Recreational and Commercial Fisheries, Shellfish and Aquaculture

Seven Major Riverine Systems Converge into the Great Bay

Permit Drivers: Water Quality and Habitat

- State of Estuaries Report revealing 14 of 24 Water Quality Indicators trending in decline or symptoms consistent of nutrient enrichment
- Approx. 40% loss of Eelgrass habitat in 20-year period
- Decrease in water clarity and light penetration
- Lower Dissolved Oxygen Levels
- Increased micro and macroalgae productivity

Panel Discussion Format

8:30-9:30 - Regulator/Stakeholder Presentation; Q&A

- EPA Ellen Weitzler, Chief of EPA Wastewater Permit Section
- NHDES Ted Diers, Administrator, Watershed Management Bureau
- CLF Melissa Paly, Great Bay-Piscataqua WaterKeeper

9:30-10:30 - Municipal Representatives Q&A

- City of Portsmouth; Suzanne Woodland; Deputy City Mgr/ City Attorney
- City of Dover, Gretchen Young, PE, Environmental Projects Manager
- City of Rochester; James Steinkrauss, Counsel, Rath Young and Pignatelli
- City of Portsmouth, Terry Desmarais, City Engineer

Great Bay
Total Nitrogen General Permit

NEWEA

January 24, 2022

Ellen Weitzler, EPA Region 1
Chief, Wastewater Permits Section

Clean Water Act

National Pollutant Discharge Elimination System (NPDES) Program

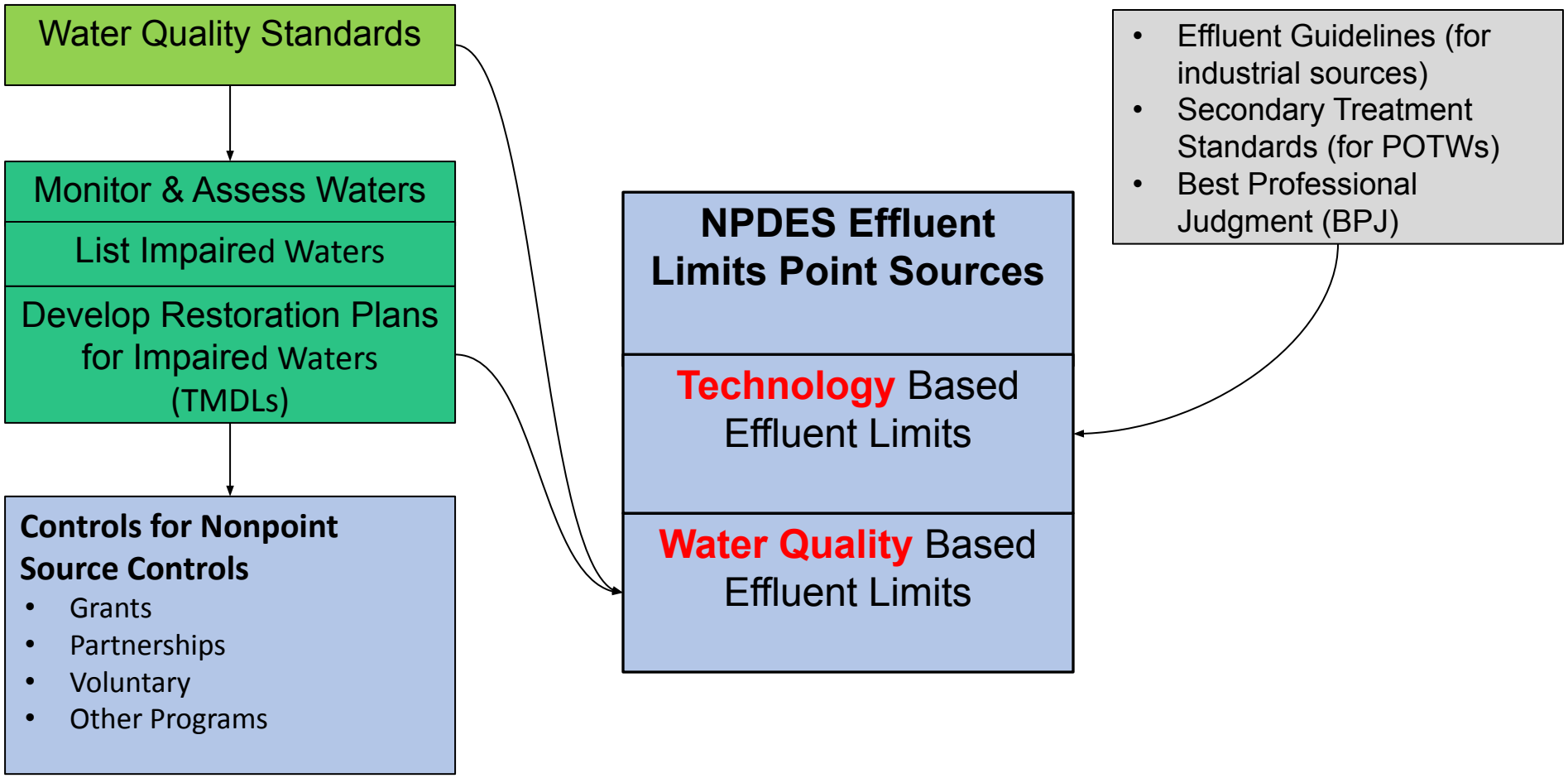
NPDES permits are required for:

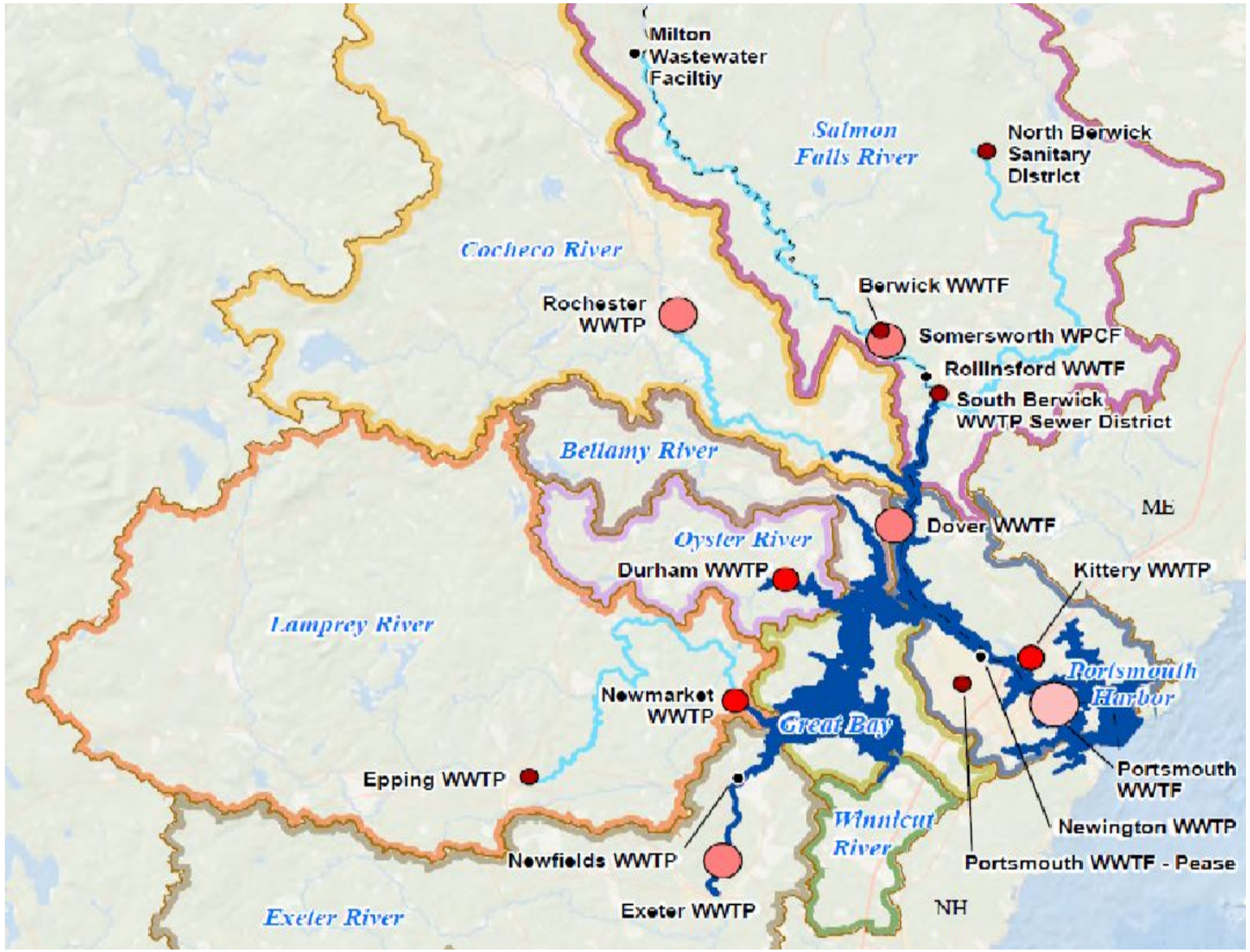
- Any point source discharge of a pollutant to “waters of the US”

They provide:

- legal authority to discharge

How do NPDES integrate with other Clean Water Act Programs?





Great Bay Watershed:

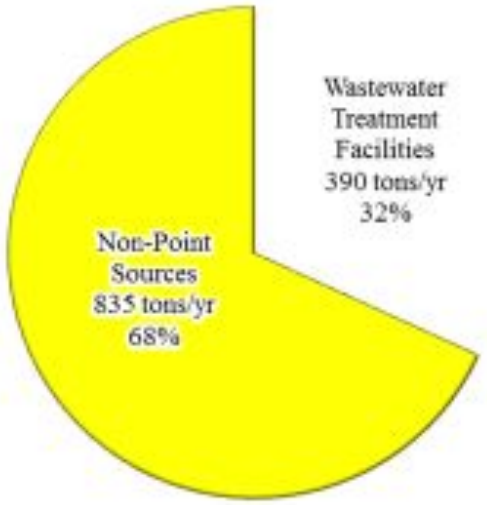
13 New Hampshire Publicly Owned Treatment Works (POTWs)

4 Maine POTWs

General Permit – Non-Point Source

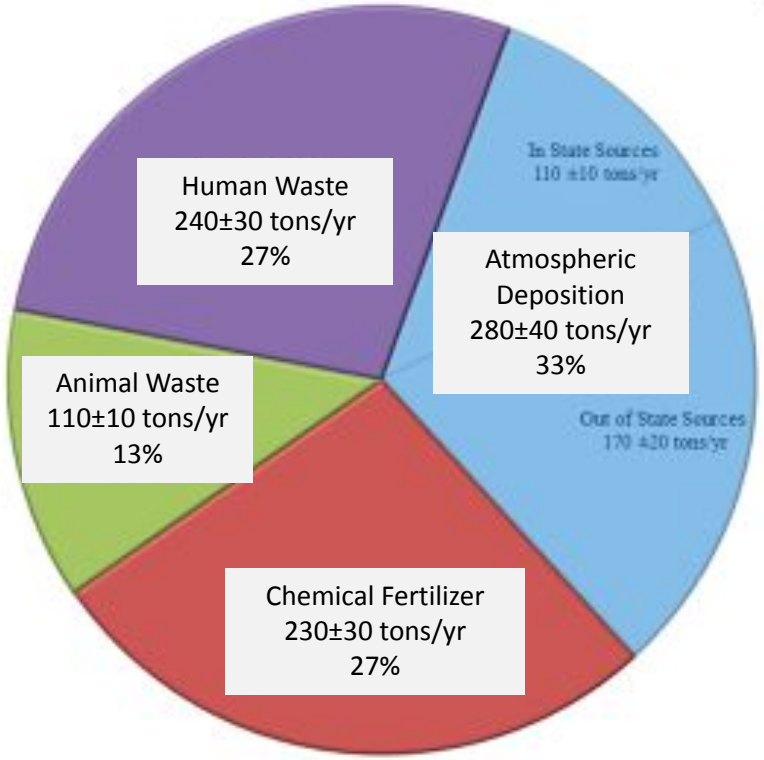
From PREP (2013)

DES Great Bay Nitrogen Non-Point Source Study



Total Load
1,225 Tons/yr

Nitrogen Loading Model



Non-Point Source Load
900 ±100 tons/yr

Non-Point Source Load
Delivered by Stormwater = 26%

Timeline Part 1

1996 – 2006+

Steady eelgrass loss throughout Great Bay

2006 nitrogen load at historical peak of 277 kg/ha-yr

2007 – 2009

NHDES develops draft nitrogen criteria to protect water quality and restore eelgrass (~0.3 mg/L)

2012

Permits issued for Exeter and Newmarket WWTFs with limit of 3 mg/L

2014

As a result of lawsuit from municipal coalition, NHDES withdraws support for draft nitrogen criteria

Strong encouragement from NH municipalities for EPA to consider an adaptive management approach in future permits

2017

EPA begins working on permit for Rochester WWTF

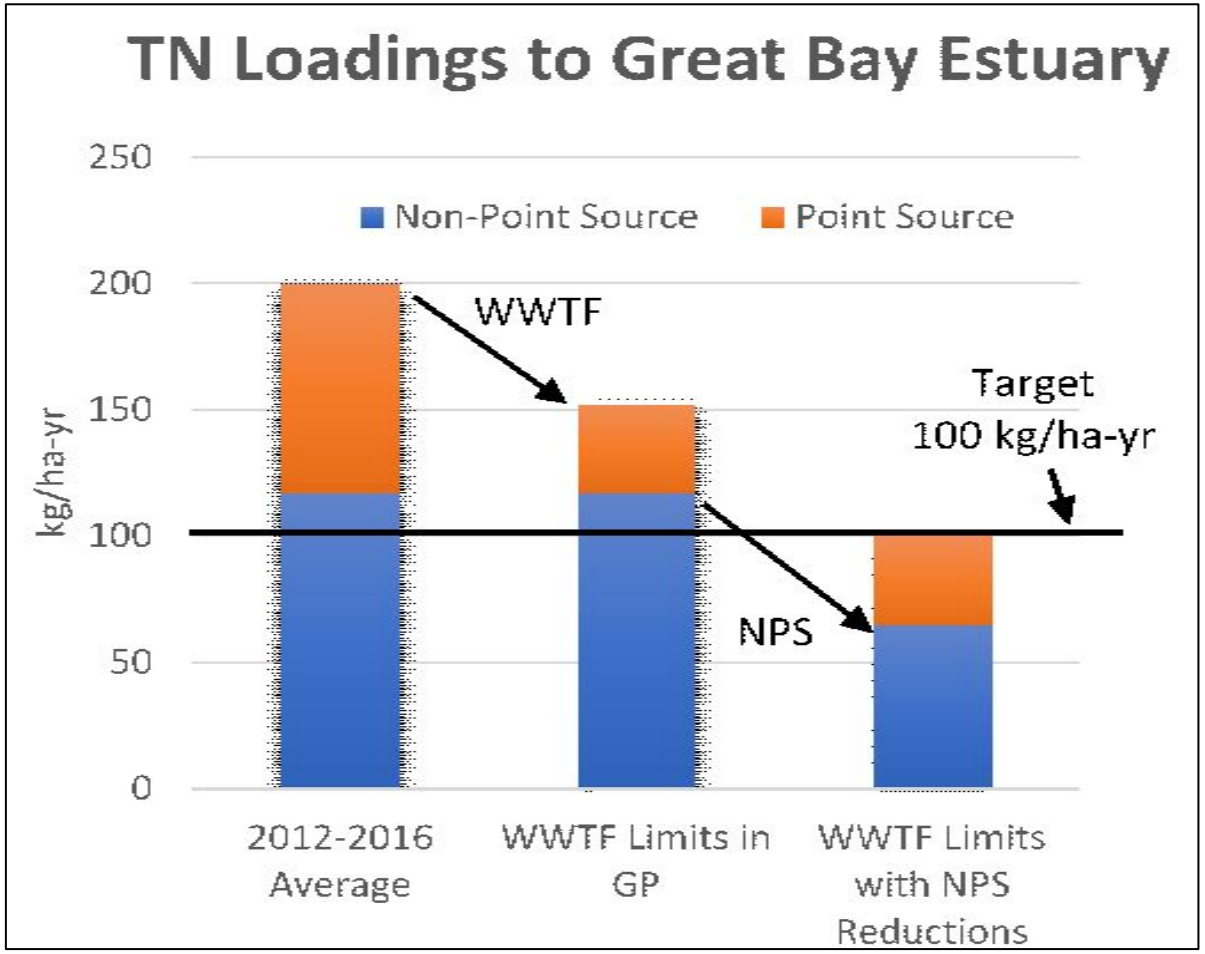
EPA must develop new numeric target for establishing permit limits

Adaptive Management

Adaptive management is an approach to natural resource management that emphasizes learning through management where knowledge is incomplete, and when, despite inherent uncertainty, managers and policymakers must act.

(Allen, C. and A. Garmestani. Adaptive Management. Chapter 1, Craig R. Allen, Ahjond Garmestani (ed.), Adaptive Management of Social-Ecological Systems. Springer Netherlands, Dordrecht, Netherlands, , 01-10, (2015)

Point Source vs. Non-point Source Reduction



Timeline Part 2

2017

EPA begins working on permit for Rochester WWTF

EPA must develop new numeric target for establishing permit limits

2018

Load-based approach developed targeting 100 kg/ha-yr for entire estuary

Permit broadened to cover all 13 WWTFs at once and only for nitrogen.

Late 2018

EPA and NHDES begin working with Great Bay municipalities on a loading-based adaptive management permitting approach…

2020

Draft Permit public Notice January through May.

Received comments from 229 organizations and individuals.

Final Permit Issued 11/24//2021, initiating 120-day appeal period

2020-2021

From final issuance through end of appeal period, the communities and CLF initiated facilitated discussion regarding NPS reductions in the watershed supported by EPA and NHDES

2021

All 13 NH POTWs opt into Great Bay Total Nitrogen General Permit

Permit requirements take effect May 1, 2021

Permit Requirements:

- TN limits based on:
- 8 mg/L at current flows for larger facilities and
- “hold the load” for smaller facilities

Permit Assumption:

- Communities within the Great Bay Watershed will be implementing strategies that reduce non-point sources of total nitrogen to Great Bay.

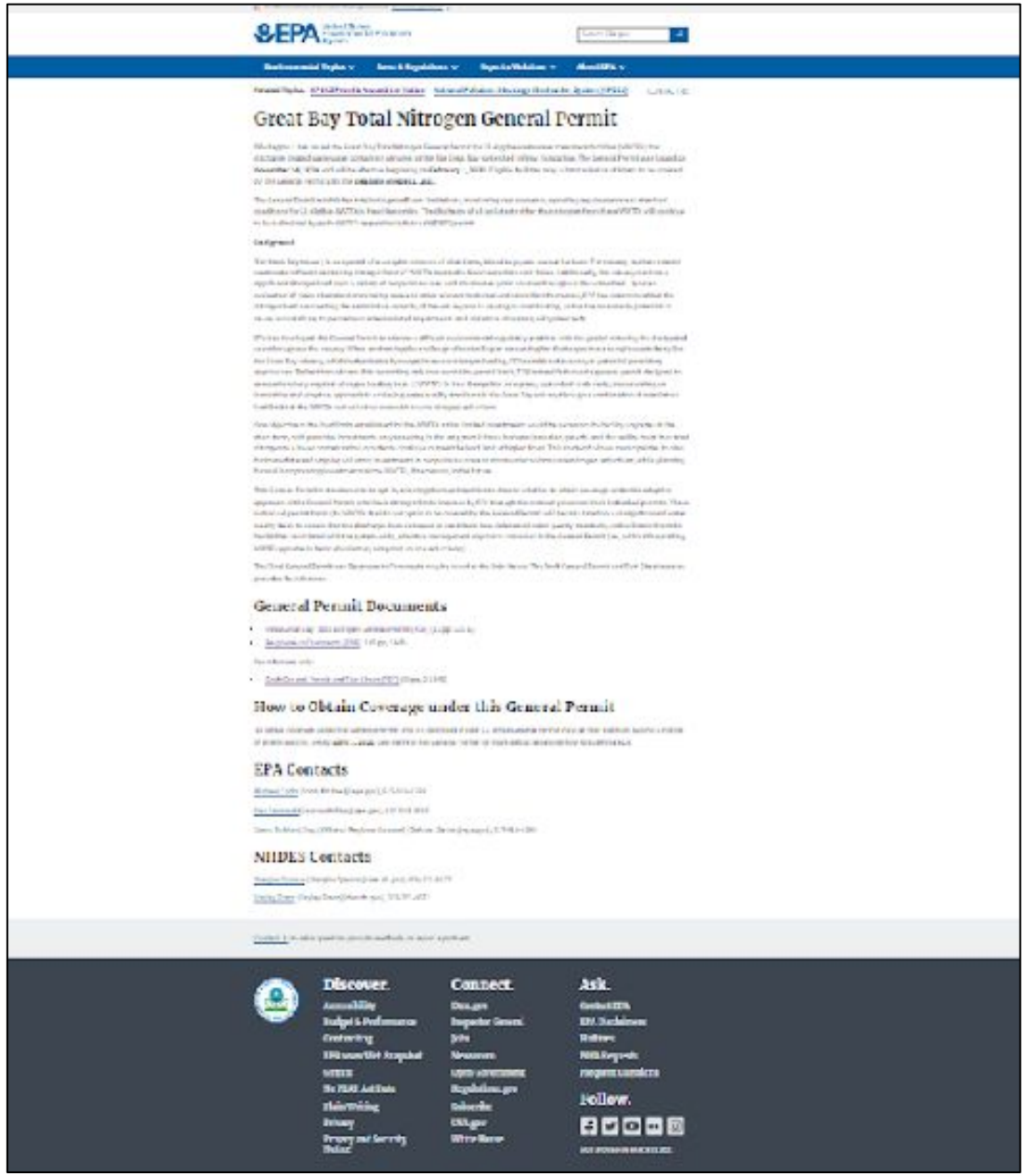
Total Nitrogen Limitations	
Facility	**Rolling Seasonal Average (lb/day) (April – October)**
Rochester	198
Portsmouth	248
Dover	167
Exeter	106
Durham	59
Somersworth	92
Pease ITP	93
Newmarket	30
Epping	43
Newington	15
Rollinsford	Report[1]
Newfields	16
Milton	Report[1]

[1]Effluent limit to be established in 2023 based on new TN data.

Part 3 – Voluntary component of the permit (paraphrased):

1. By July 2021 submit a proposal as specified below:
    a. The approach to monitor the ambient water quality in the Great Bay estuary to determine progress and trends.
    b. The method(s) to track reductions and additions of total nitrogen over the course of the permit.
    c. An outline/plan for overall source reductions of total nitrogen over the course of the permit.
    d. An inclusive and transparent process for comprehensively evaluating any significant scientific and methodological issues relating to the permit, including the choice of a loadbased threshold of 100 kg ha-1 yr-1 versus any other proposed threshold, including a concentration-based threshold of 0.32 mg/L.
    e. A proposed timeline for completing a Total Maximum Daily Load (TMDL) for Total Nitrogen in Great Bay and for submitting it to EPA for review and approval.
2. Permittees may, at their election, submit this proposal jointly or separately. EPA encourages permittees to consult with NHDES, the Piscataqua Region Estuaries Partnership (PREP) and other interested parties in advance of their proposed submission(s).

More Information about the Great Bay Total Nitrogen General Permit at: https://www.epa.gov/npdes-permits/great-bay-total-nitrogen-general-permit



Great Bay Nitrogen General Permit - State Role

- New Hampshire is non-delegated for NPDES
- Asked EPA for flexibility – promised assistance

- Technical Assistance
  - Monitoring
  - PTAP
  - Nitrogen Reduction
- Science
  - Data analysis
  - Modeling
  - TMDL (or alt)
- Funding
  - Monitoring
  - SRF – planning and implementation
  - ARPA

Ted Diers, NH DES
(603) 568-5991
Ted.diers@des.nh.gov

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Piscataqua Region Monitoring Collaborative (PRMC)

- What is PRMC?

- What questions is it trying to answer? Eg.
  - **Is the health of eelgrass and related factors at key index sites changing over time?**
  - **Are light conditions at key sites changing over time?**
  - **Are important Water Column parameters changing over time?**
  - **Are Phytoplankton Size and Species Composition changing over time?**

- How much does it cost?

- How are decisions made?

- How does it relate to the permit?

Pollution Tracking and Accounting Program (PTAP)

- What is PTAP?
- How was it developed?
- What is its current status and use?
- Where does PTAP “live”?
- Who owns/manages PTAP?
- How is PTAP funded?
- UNH and NHDES tech. assistance for program implementation and growth

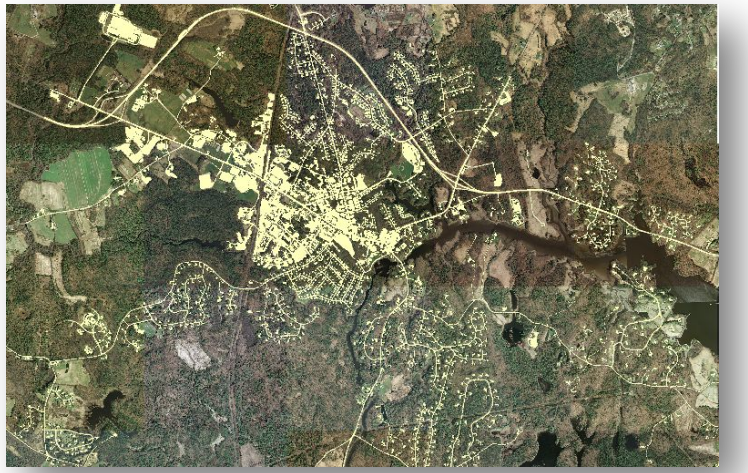
Newmarket Example

Structural BMP	IC Managed (acres)	# of BMPs
Bio-filtration	0.83	4
Enhanced Bio-filtration with Internal Storage Reservoir (ISR)	0	0
Extended Dry Detention Pond	0	0
Gravel Wetland	0.56	1
Infiltration/Surface Infiltration	7.98	9
Infiltration Trench	1.86	2
Porous Pavement	0	0
Sand Filter	0	0
Water Quality Grass Swale with Detention	0	0
Wet Ponds	0	0
Other	0	0
Not Specified	0	40
Totals	**11.23**	**56**
Total EIC	**-9.35**	

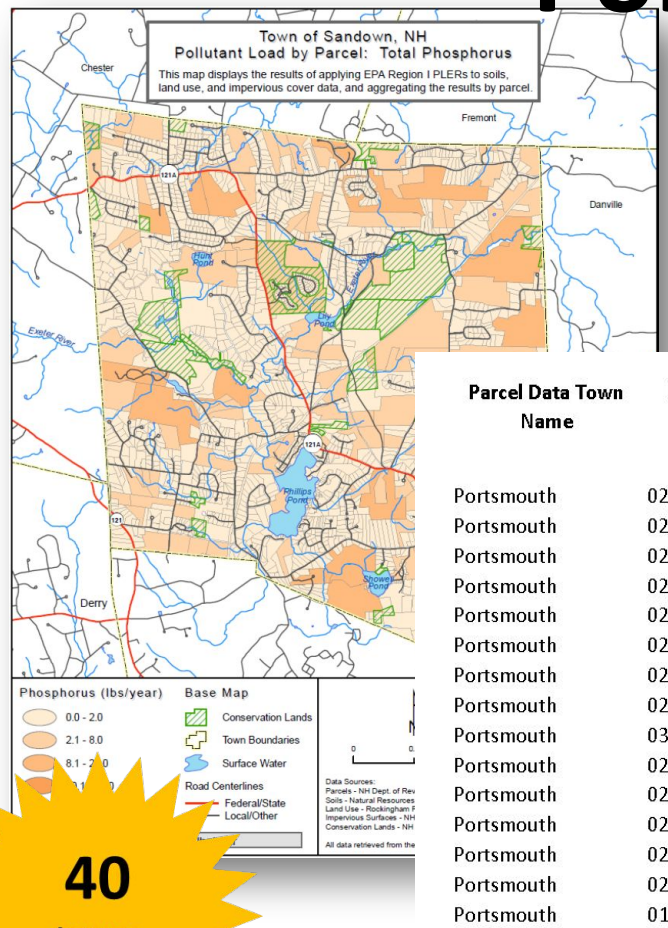
= Reduction of ~ 15 lbs of TN

Nitrogen reductions

- Some of this is “baked in” – atmospheric deposition, redevelopment (1.4% per year), changes in ordinances, baseline is 2016 (maybe earlier for NPS).
- Can’t get 40% reduction from 8% of the land area.
- Need plans and priorities for implementation
- Possibility for low-cost approach for planning – Hot spots



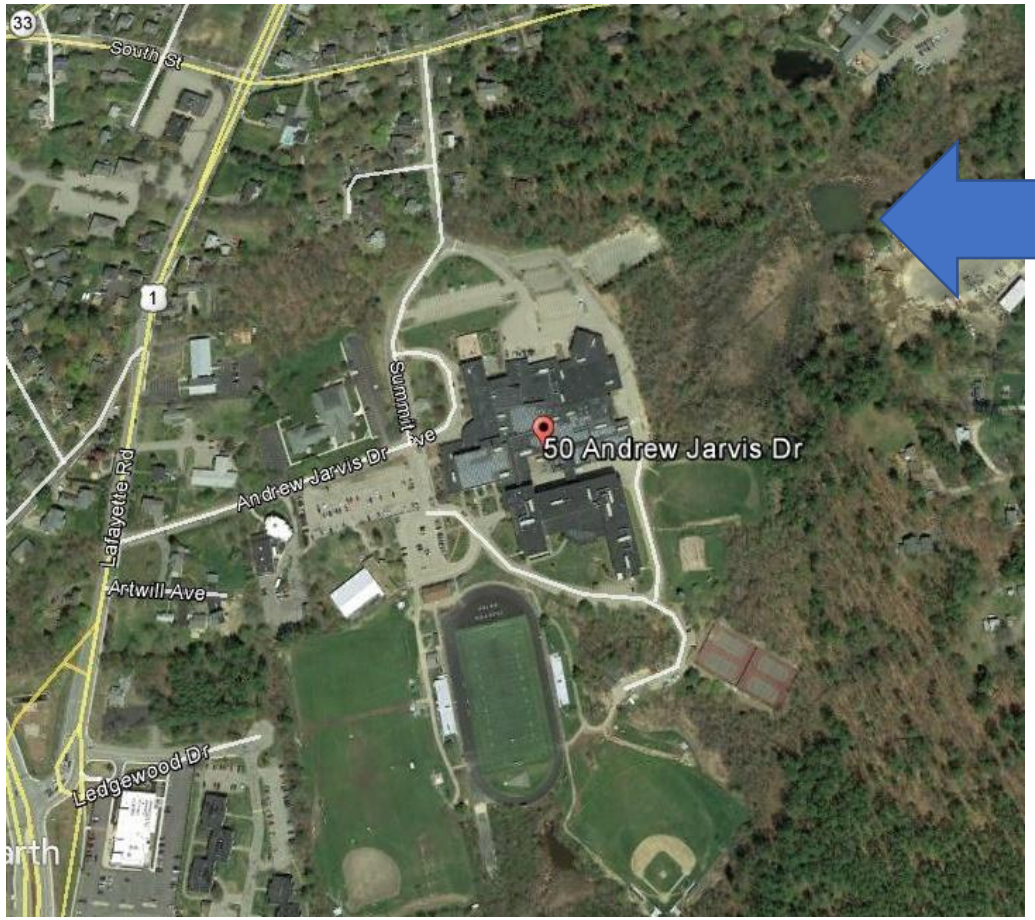
Pollutant Hot Spot Data



40 towns mapped

Parcel Data Town Name	Map Block and Lot Number (Mblu)	Town Owned Flag	Conservation Lands Flag	Acres	IC Acres	ScoreTSS	ScoreTP	ScoreTN	
Portsmouth	0214-0002-0000	0	0	40.92	19.45	8738.13	34.15	288.40	Likely off Gosling road - near Schiller Station
Portsmouth	0229-0003-0000	1	1	55.34	17.94	9866.36	33.19	281.40	50 Andrew Jarvis Road
Portsmouth	0291-0007-0000	0	0	67.10	20.33	15490.07	35.80	264.83	3201 Lafayette Road
Portsmouth	0272-0009-0000	0	1	68.22	12.78	11067.80	32.24	264.81	N/F
Portsmouth	0273-0005-0000	0	0	74.14	18.27	12833.20	31.70	246.58	2300 Lafayette Road
Portsmouth	0216-0003-0000	0	0	19.87	16.23	6134.66	28.89	245.03	1465 Woodbury Ave.
Portsmouth	0273-0003-0000	0	0	18.71	15.81	5989.55	28.20	239.32	N/F
Portsmouth	0223-0030-0000	0	1	53.34	14.61	11379.92	29.96	231.28	N/F
Portsmouth	0313-0003-0000	0	0	21.55	14.04	5300.20	25.00	212.06	164-166 Corporate Drive
Portsmouth	0211-0001-0000	0	0	32.62	13.89	5322.87	24.65	208.85	3 Michael Succi Drive - Nat'l Gypsum
Portsmouth	0240-0002-0001	0	1	19.63	13.53	5238.25	24.51	208.41	333 Borthwick Ave. - HCA Health
Portsmouth	0238-0020-0000	0	0	23.26	14.08	6518.70	24.61	207.54	100 Arthur F. Brady Drive
Portsmouth	0285-0016-0002	0	0	20.26	14.26	7336.87	24.69	207.40	2460 Lafayette Road - WalMart
Portsmouth	0254-0007-0000	0	0	26.52	12.79	4883.44	22.74	192.77	650 Peverly Hill Road - Pike Industries
Portsmouth	0119-0005-0000	0	0	12.65	11.59	4417.08	20.60	174.72	555 Market St. - Port Auth
Portsmouth	0305-0006-0000	0	0	16.22	11.23	4573.31	19.85	168.03	101 Int. Dr. - Lonza
Portsmouth	0238-0016-0000	0	0	15.94	10.28	3973.04	18.65	158.70	1600 Woodbury Ave
Portsmouth	0307-0002-0000	0	0	17.61	13.73	20442.20	18.87	144.66	12 Aviation Ave. - PDA
Portsmouth	0217-0002-0000	0	0	27.32	10.59	6384.36	19.12	143.02	N/F
Portsmouth	0308-0000-0000	0	0	18.34	9.57	5571.33	16.94	142.61	Aviation Ave - PDA
Portsmouth	0239-0018-0000	0	0	16.75	9.41	4956.34	16.78	141.77	100 Durgin Lane
Portsmouth	0254-0008-0000	1	0	60.36	7.83	4228.15	15.94	137.93	DPW - 680 Peverly

Project implementation planning

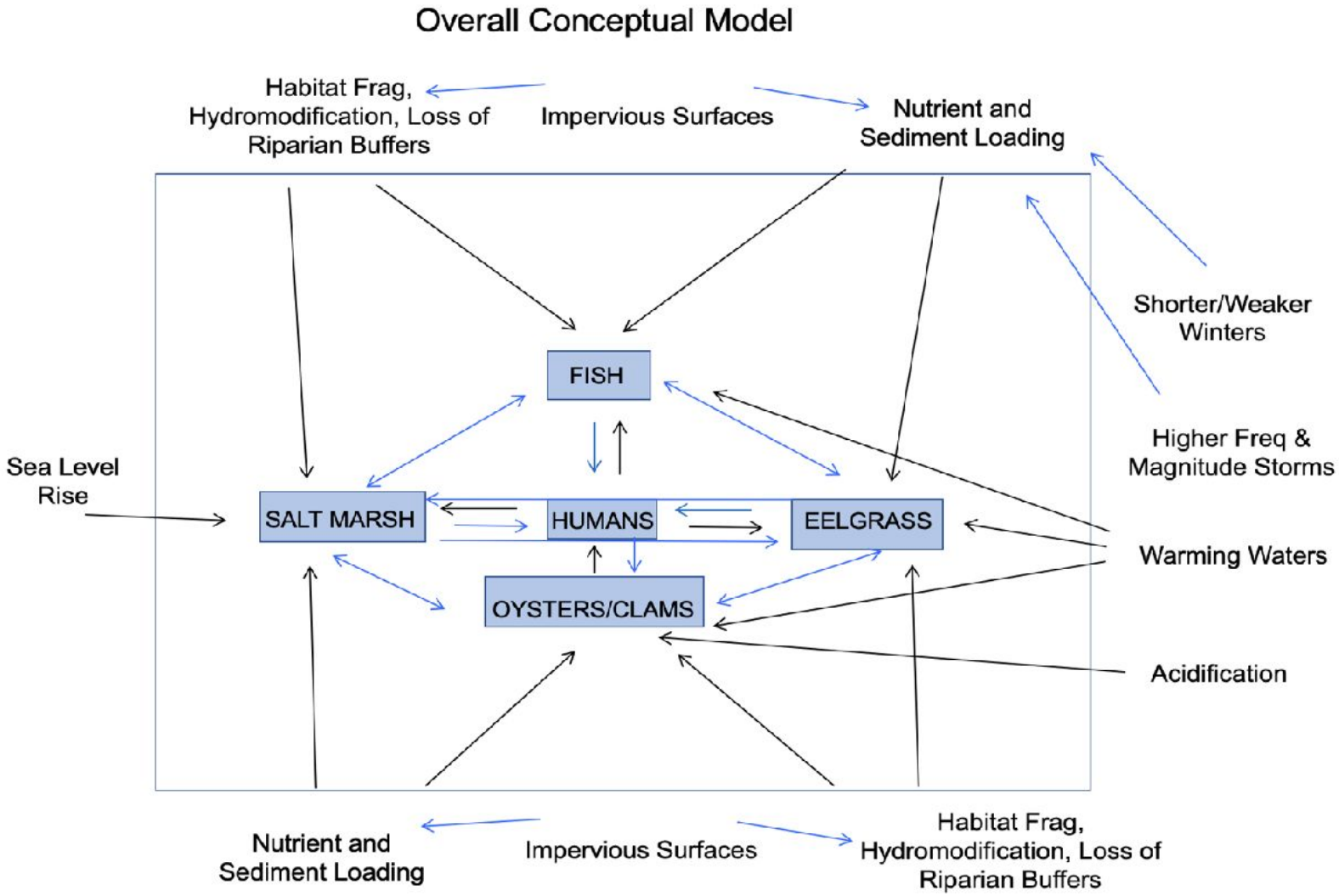


Here is 50 Andrew Jarvis Drive

- Highest muni N load
- Highest muni IC ac
- Second highest overall N
- Fourth highest overall IC
- *Note:* Flagged as conservation

Up to the community to decide what to do and where

Scientific & methodological issue evaluation



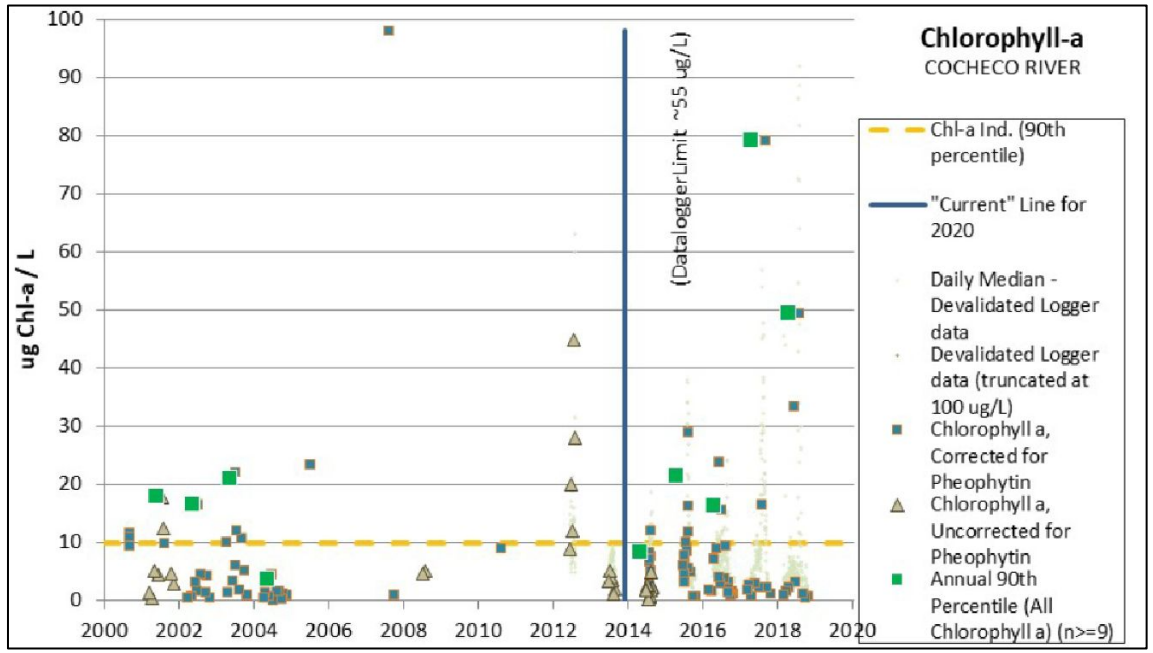
Proposed TMDL timeline

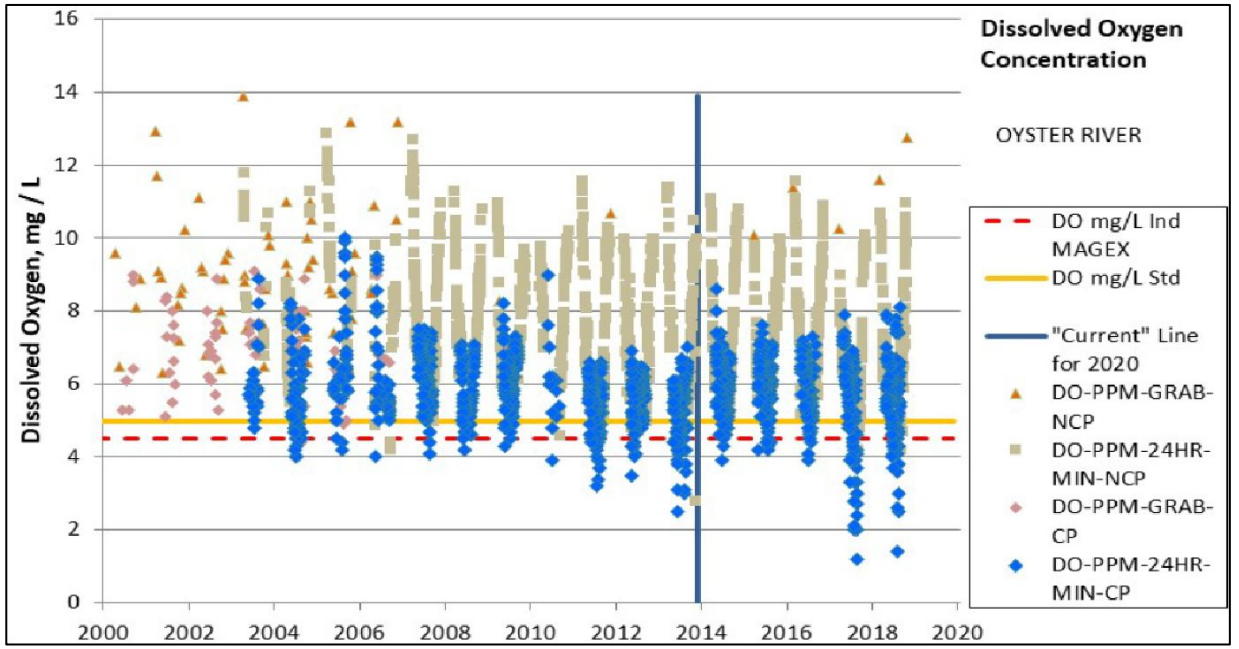
- NHDES involvement early in process
- What is the target?
- Make a decision at 5 years
- Will need contractor assistance

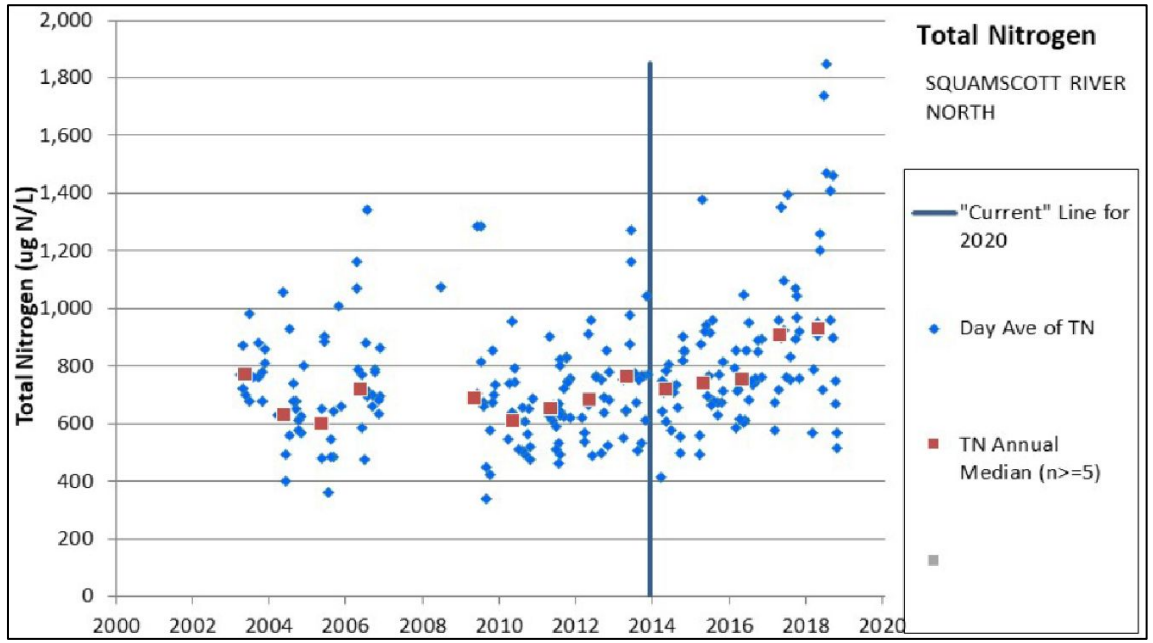
TMDL Requirements:

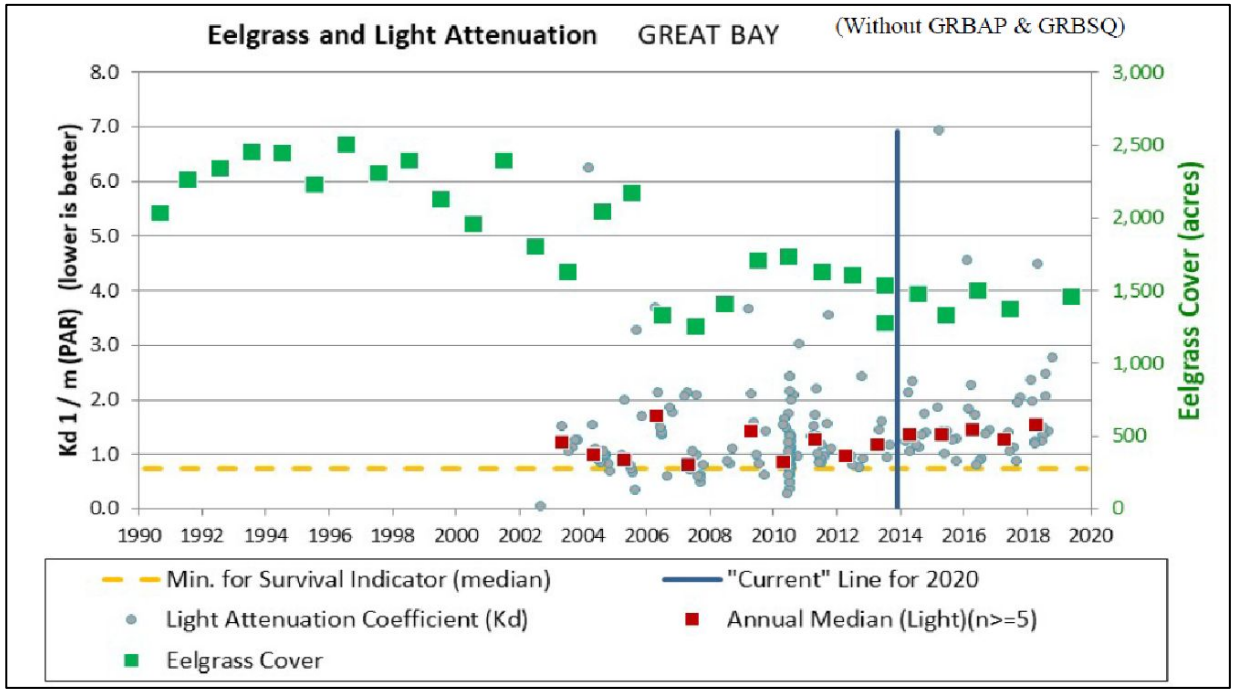
- Pollutant(s) to consider.
- Estimation assimilative capacity
- Estimation of loading from all sources
- Analysis and determination of needed reductions.
- Allocation (with margin of safety) of the allowable pollutant load among the different pollutant sources.

303d/305b Assessments









Funding

- Clean Water SRF – stormwater planning and implementation
- Asset management – loan forgiveness
- ARPA -- $150 million for water and sewer infrastructure, dams, PFAS
- Infrastructure Act – Additional funds for PREP, NERRS, and SRF
- Ongoing funding of projects and monitoring

Clean Water
State Revolving Fund

Bipartisan Infrastructure Investment and Jobs Act

The Grand Experiment

- Estuaries are “messy”
- Monitoring to feed model and trend analysis
- Modeling
- Some pieces are totally unknown – sediment budget, sediment nutrient flux, impacts of temperature, carbon budget – acidification, river darkening (DOC) – changing climate
- Confounding variables – which ones can actually be managed?
- Policy/permits/future investment will be made based on this science
- Adapt permit as conditions and science warrant
- Permit gets to stormwater and NPS reductions sooner than later

clf
conservation law foundation

Great Bay-Piscataqua
WATERKEEPER ®

For a Thriving New England


SASQUATCH


Courtesy Kalle Matso,PREP

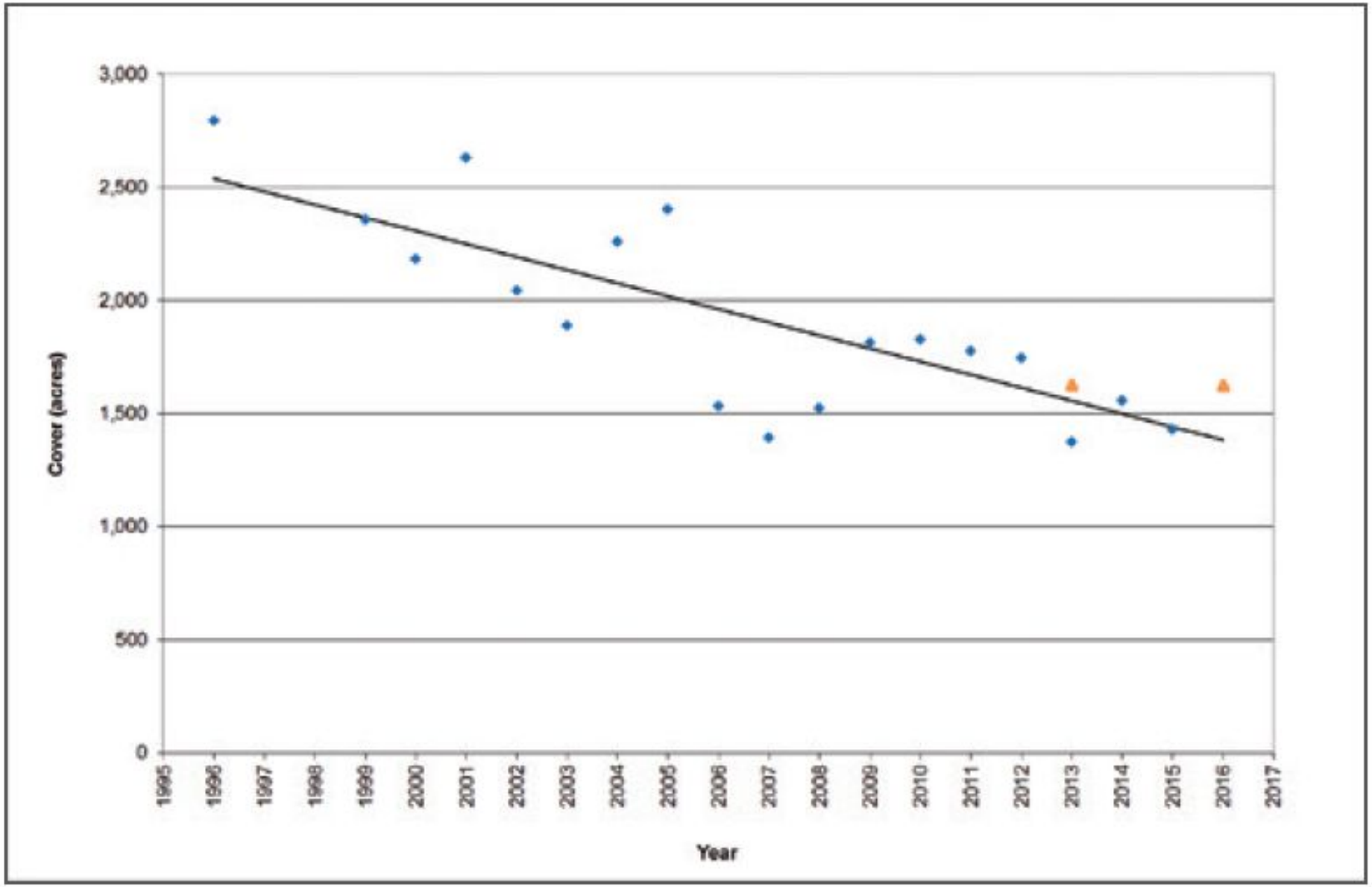


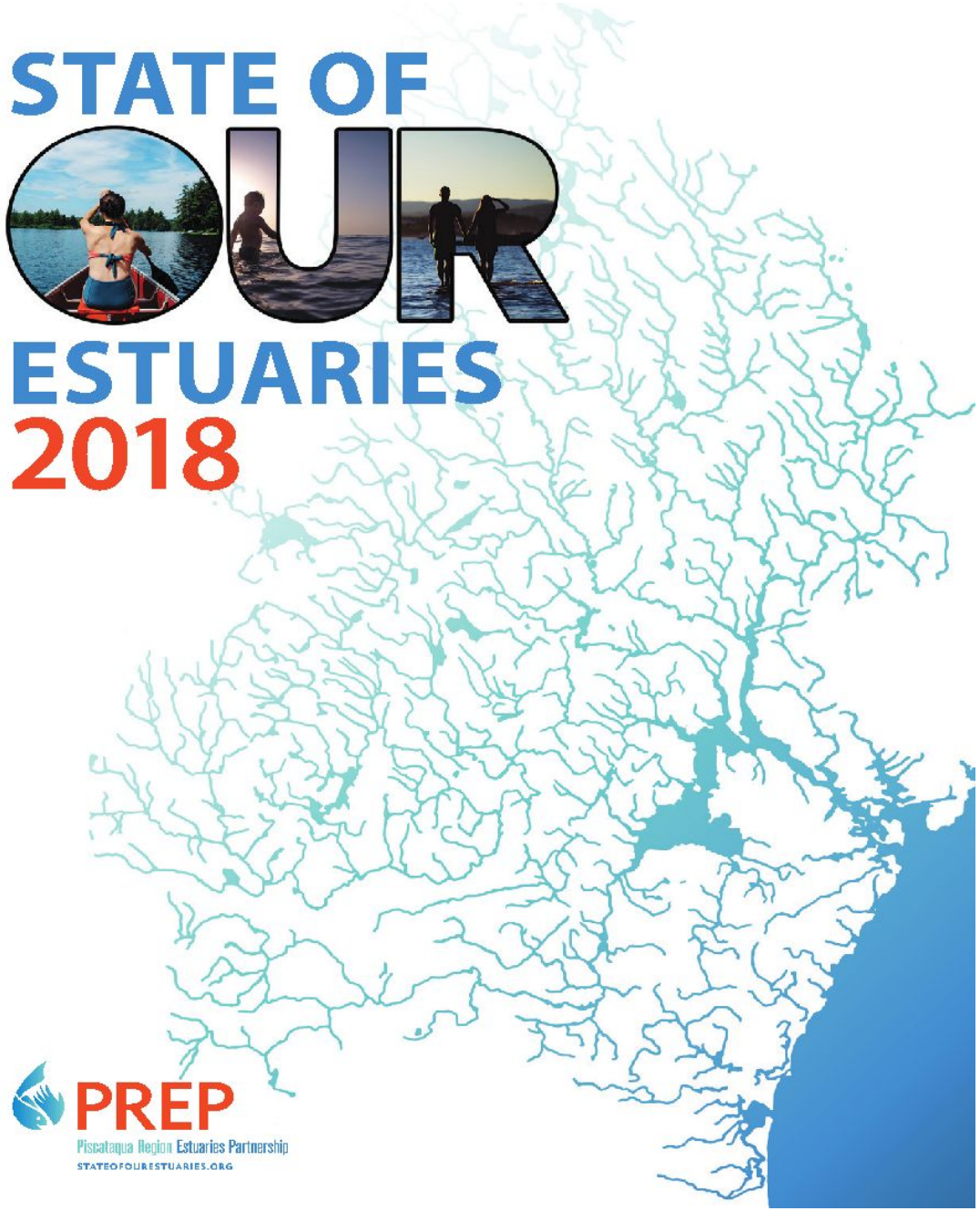
Figure 8.1 Eelgrass cover in the Great Bay Estuary.

NHDES Draft 2020 Section 303(d) Surface Water Quality List, November 10, 2020

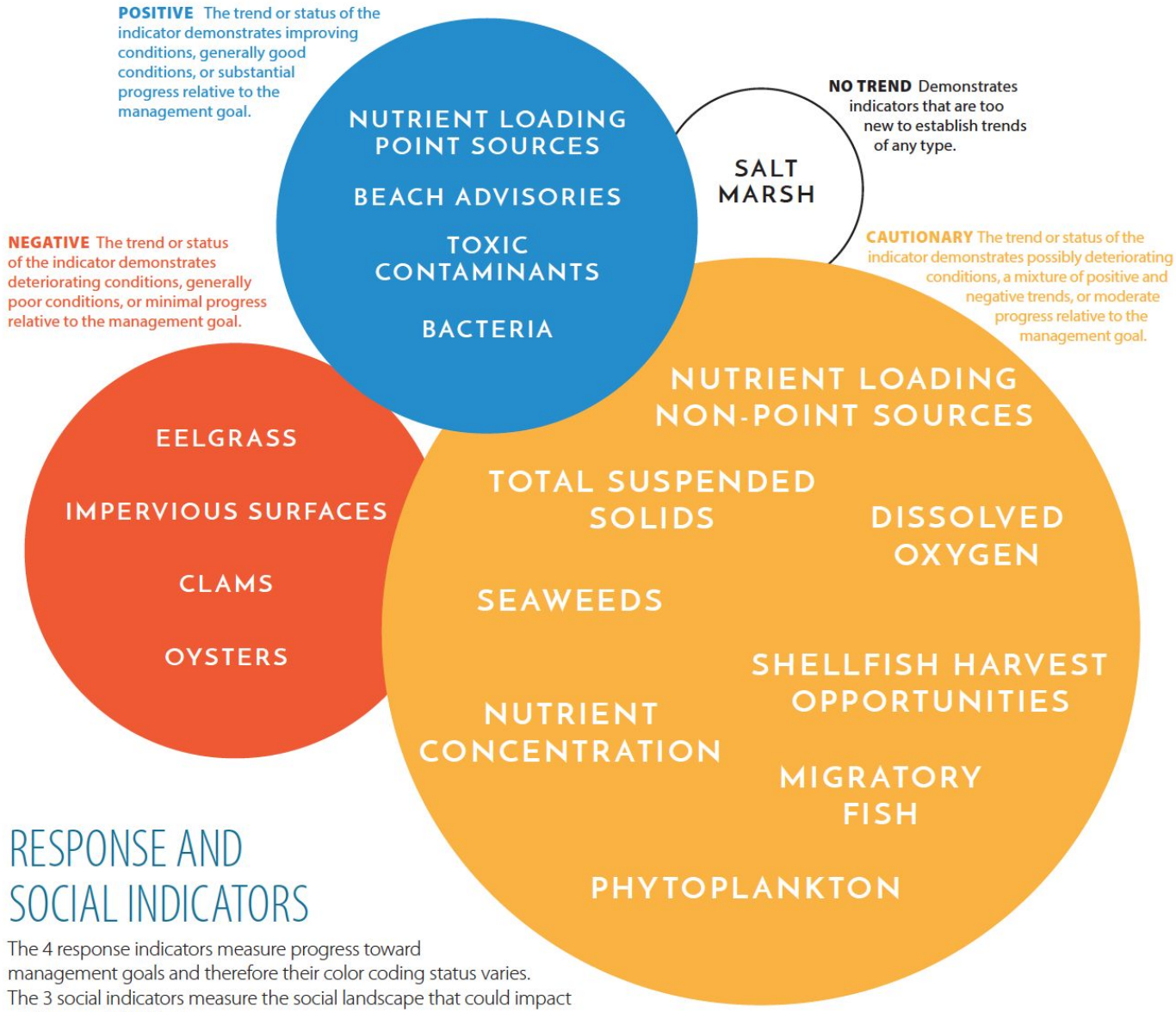
Assessment Zone	2012	2014	2016	2018	2020 (in Draft)
Great Bay	NHDES: 5-M EPA: Approved	NHDES: 3-PNS EPA: Deferred	NHDES: 3-PNS EPA: Deferred	*NHDES: Assess. Zone Withdrawn*	NHDES: 5-M EPA: *TBD*
Bellamy	NHDES: 5-P EPA: Approved	NHDES: 3-PNS EPA: Deferred	NHDES: 3-ND EPA: Deferred	*NHDES: Assess. Zone Withdrawn*	NHDES: 5-P EPA: *TBD*
Little Bay	NHDES: 5-M EPA: Approved	NHDES: 3-PNS EPA: Deferred	NHDES: 3-PNS EPA: Deferred	*NHDES: Assess. Zone Withdrawn*	NHDES: 3-PNS EPA: *TBD*
Cocheco River	NHDES: 5-P EPA: Approved	NHDES: 3-PNS EPA: Deferred	NHDES: 5-M EPA: Approved	NHDES: 5-M EPA: Approved	NHDES: 5-M EPA: *TBD*
Upper Piscataqua River	NHDES: 5-P EPA: Approved	NHDES: 3-PNS EPA: Deferred	NHDES: 3-PNS EPA: Deferred	*NHDES: Assess. Zone Withdrawn*	NHDES: 3-PNS EPA: *TBD*
Portsmouth Harbor	NHDES: 5-M EPA: Approved	NHDES: 3-PNS EPA: Deferred	NHDES: 2-M EPA: Deferred	*NHDES: Assess. Zone Withdrawn*	NHDES: 2-M EPA: *TBD*
Little Harbor/Back Channel	NHDES: 5-M EPA: Approved	NHDES: 3-PNS EPA: Deferred	NHDES: 3-ND EPA: Deferred	*NHDES: Assess. Zone Withdrawn*	NHDES: 3-ND EPA: *TBD*

Assessment Category

2-M	Full Support-Marginal
3-ND	Insufficient Information – No Data
3-PNS	Insufficient Information – Potentially Non-support
5-M	Impaired-Marginal
5-P	Impaired-Poor


STATE OF
OUR
ESTUARIES
2018
PREP
Piscataqua Region Estuaries Partnership
STATEOFOURESTUARIES.ORG

INDICATOR SUMMARY



RESPONSE AND SOCIAL INDICATORS

The 4 response indicators measure progress toward management goals and therefore their color coding status varies. The 3 social indicators measure the social landscape that could impact environmental indicators.

At **43.6 tons** per square mile (of tidal estuary surface area), **nitrogen levels between 2012 and 2016 were much higher than the 14 tons per square mile threshold for eelgrass health** indicated in a 2010 study of 62 New England estuaries.[8] … **our system has three times the threshold level** from that study...

PREP SOOE 2018 p8

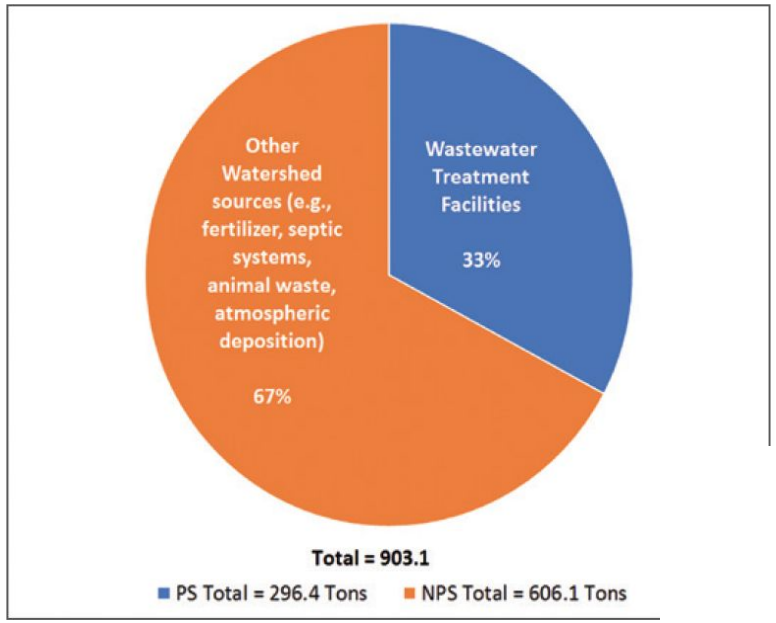
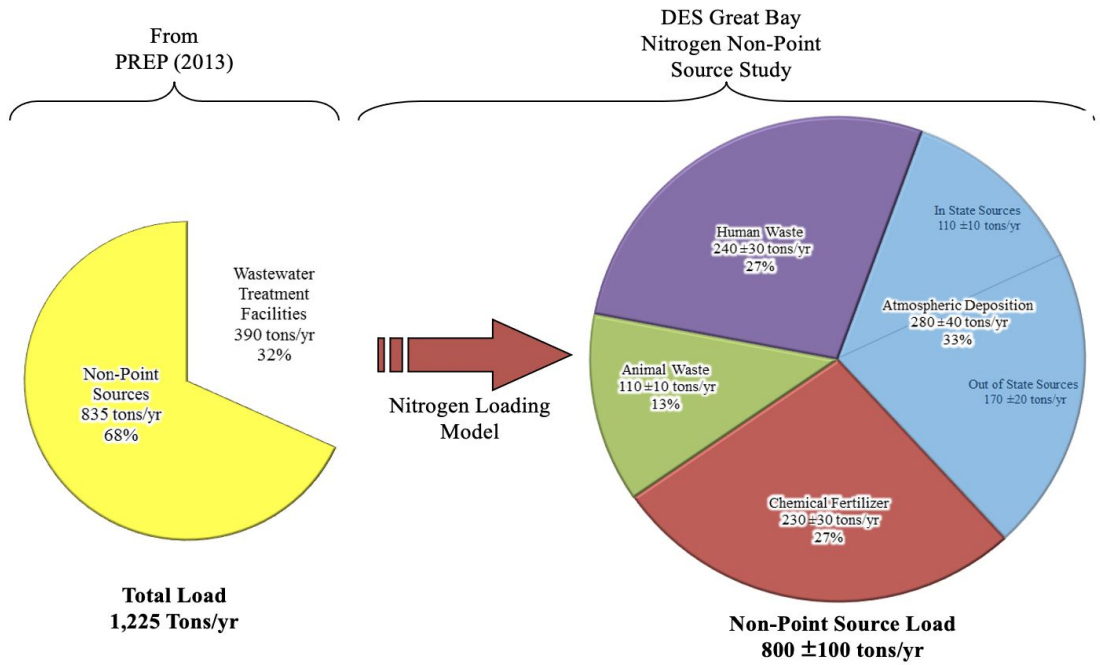


Figure 3.2 Total nitrogen loads from different sources (2012 to 2

Data Source: NH Water Resources Research Center

Sources of Nitrogen in the Estuary



Non-Point Source Load Delivered by Stormwater = 26%

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New Hampshire NPDES Permits

This page contains information on EPA New England issued individual facility-specific permits and general permits that cover multiple facilities within a specific category and geographic area.

Authorization: In New Hampshire NPDES permits are issued by EPA New England.

- 2012 Newmarket NPDES permit – 3.0 mg/l, stormwater management plan
- 2013 Exeter Administrative Order on Consent – 3.0 mg/l, interim 8 mg/l, stormwater management plan
- 2014 Rochester voluntary agreement – 8 mg/l
- 2015 Dover voluntary agreement – 8 mg/l
- 2016 Portsmouth Consent Decree – 8 mg/l, mitigation requirements

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GREAT BAY TOTAL NITROGEN GENERAL PERMIT FOR WASTEWATER TREATMENT FACILITIES IN NEW HAMPSHIRE

NPDES GENERAL PERMIT: NHG58A000

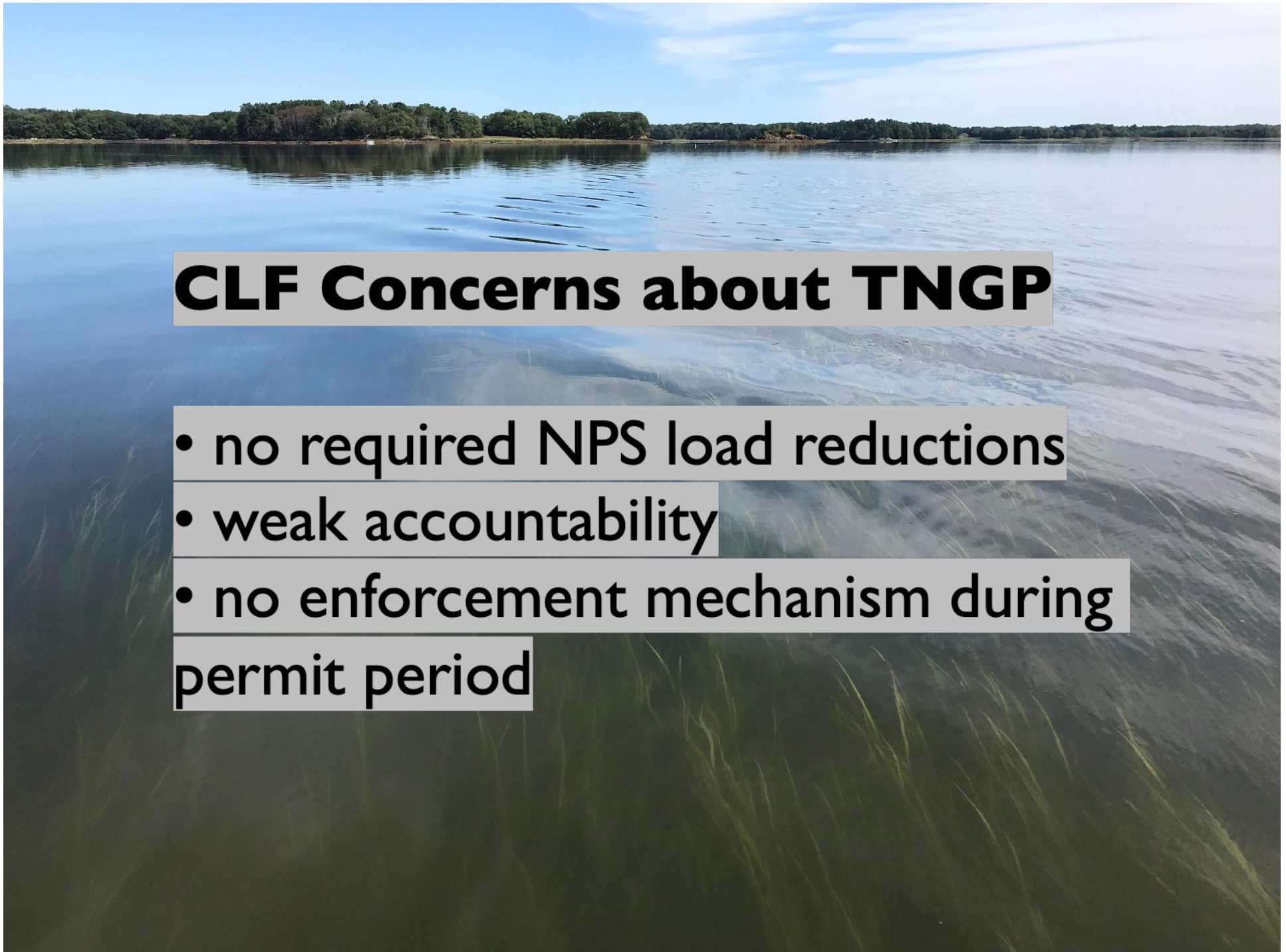
The Great Bay Total Nitrogen General Permit ("General Permit") covers discharges of nitrogen from Wastewater Treatment Facilities (WWTFs) in the State of New Hampshire listed in Part 1. Parts 2 through 6 contain General Permit provisions, including applicability and coverage requirements, effluent limitations, and monitoring and reporting requirements.

Table of Contents

Part 3 – Adaptive Management Framework Voluntary Submittal

This General Permit is one aspect of the adaptive management framework. The other elements of the adaptive management framework include ambient monitoring, pollution tracking, reduction planning, and review. Implementation of adaptive management includes collaboration between EPA, the State of New Hampshire, and public, private, and commercial stakeholders. The following provision allows Permittees the option, at their election, to be involved in this collaboration, by submitting a detailed proposal, as specified below.

1. Within 180 days of the effective date of the permit, the permittees may, at their election, submit a proposal to EPA that outlines:
    a. The approach to monitor the ambient water quality in the Great Bay estuary to determine progress and trends.
    b. The method(s) to track reductions and additions of total nitrogen over the course of the permit.
    c. An outline/plan for overall source reductions of total nitrogen over the course of the permit.
    d. An inclusive and transparent process for comprehensively evaluating any significant scientific and methodological issues relating to the permit, including the choice of a load-based threshold of 100 kg ha^{-1} yr^{-1} versus any other proposed threshold, including a concentration-based threshold of 0.32 mg/L. This submission shall include detailed milestones culminating in submission of a report to EPA for inclusion in the administrative record for permit renewal. That report shall be completed prior to expiration of the permit term and shall indicate whether the New Hampshire Department of Environmental Services (NHDES) concurs with the findings.
    e. A proposed timeline for completing a Total Maximum Daily Load (TMDL) for Total Nitrogen in Great Bay and for submitting it to EPA for review and approval.
2. Permittees may, at their election, submit this proposal jointly or separately. EPA encourages permittees to consult with NHDES, the Piscataqua Region Estuaries Partnership (PREP) and other interested parties in advance of their proposed submission(s).


CLF Concerns about TNGP
• no required NPS load reductions
• weak accountability
• no enforcement mechanism during permit period

SETTLEMENT AGREEMENT BY AND BETWEEN CONSERVATION LAW FOUNDATION AND CITIES OF DOVER, ROCHESTER, AND PORTSMOUTH

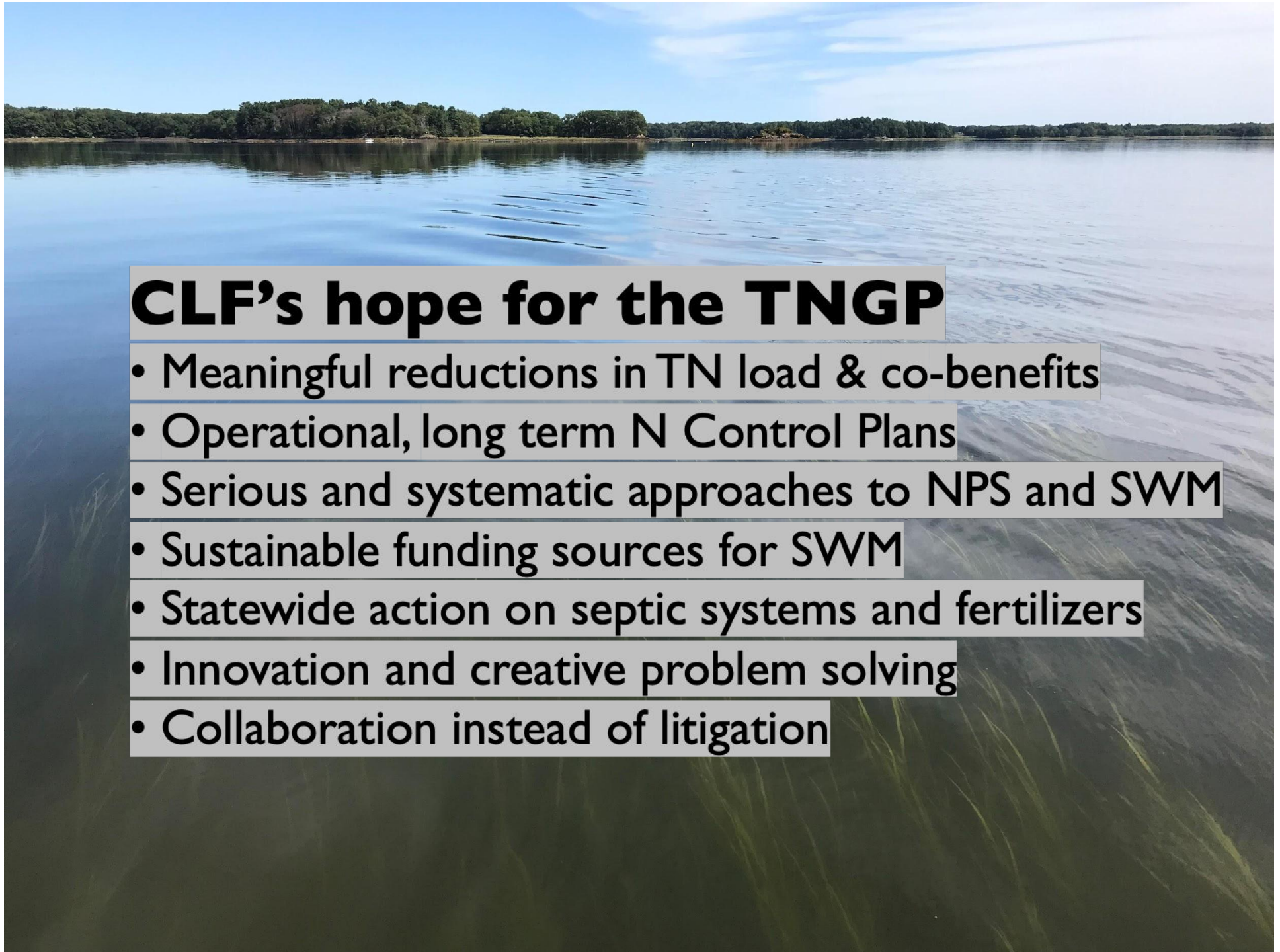
The Cities of Dover, Rochester, and Portsmouth (collectively "the Municipalities") and the Conservation Law Foundation, Inc. ("CLF"), for good and valuable consideration mutually exchanged and acknowledged, hereby enter into this Settlement Agreement ("Agreement") by and between as follows:

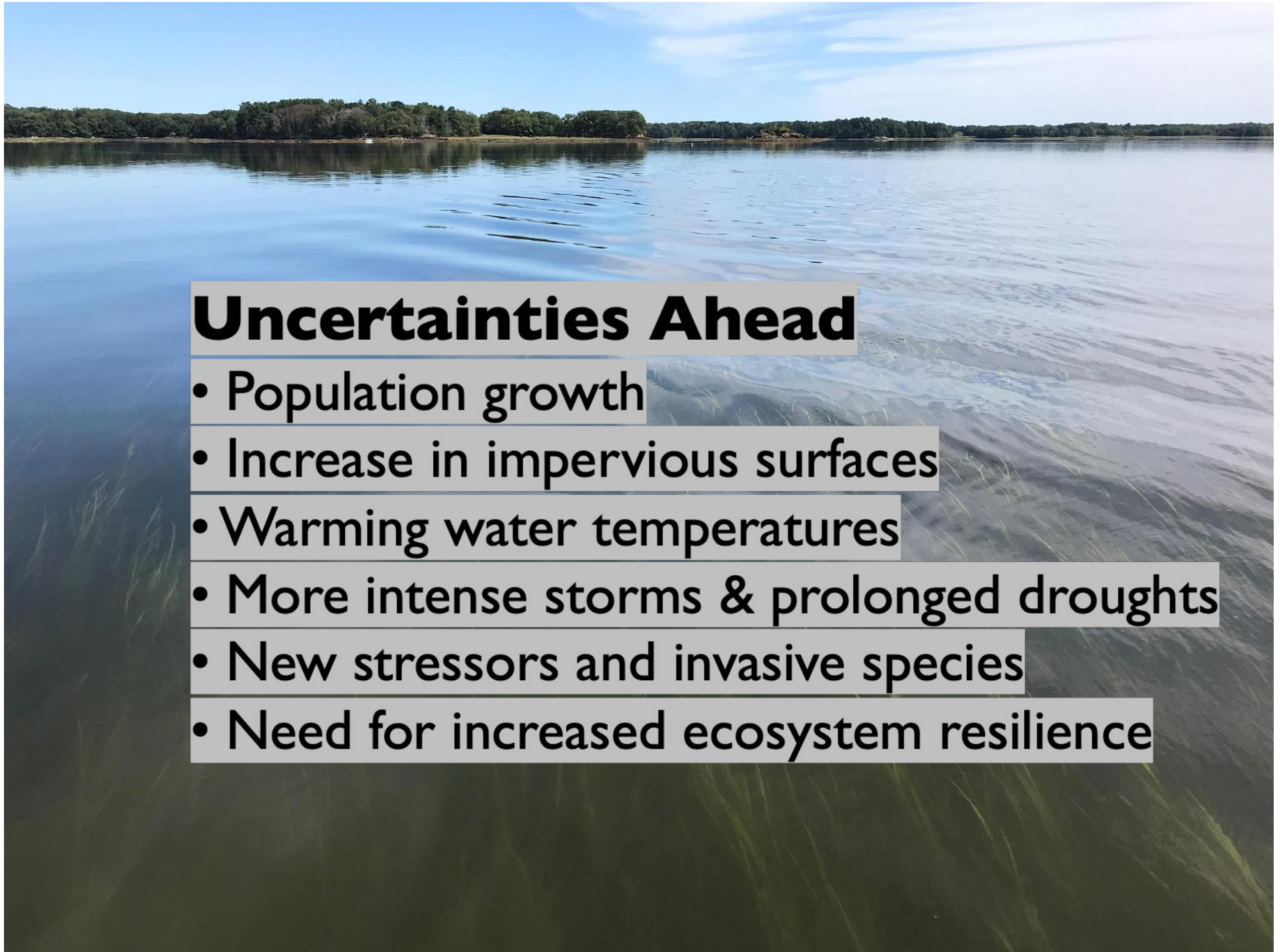
WHEREAS, in January 2020, the United States Environmental Protection Agency (Region 1) ("EPA") issued the "Draft National Pollutant Discharge Elimination System (NPDES) Great Bay Total Nitrogen General Permit for Wastewater Treatment Facilities in New Hampshire" (NPDES Permit No. NHG58A000) (hereinafter "Draft General Permit");

WHEREAS, the Municipalities, CLF, and other interested parties submitted extensive written comments on the Draft General Permit;

WHEREAS, on November 24, 2020, EPA issued the final Great Bay Total Nitrogen General Permit (NPDES Permit No. NHG58A000) (the "General Permit") along with EPA's Fact Sheet and Response to Public Comments, each *available at* https://www.epa.gov/npdes-permits/great-bay-total-nitrogen-general-permit;

WHEREAS, Part 2 of the General Permit contains final effluent limitations and monitoring requirements for each Permittee's wastewater treatment facility ("WWTF") similar to those in the draft permit, although with more recent (updated) flow data and, in keeping with scientific knowledge and past EPA permitting practice, a total nitrogen load limit based on the growing season of eelgrass;


CLF's hope for the TNGP
• Meaningful reductions in TN load & co-benefits
• Operational, long term N Control Plans
• Serious and systematic approaches to NPS and SWM
• Sustainable funding sources for SWM
• Statewide action on septic systems and fertilizers
• Innovation and creative problem solving
• Collaboration instead of litigation


Uncertainties Ahead
• Population growth
• Increase in impervious surfaces
• Warming water temperatures
• More intense storms & prolonged droughts
• New stressors and invasive species
• Need for increased ecosystem resilience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