NRPC 2024 Annual Forum

Water Supply Protection and Conservation

Wednesday, May 8, 2024 | 5:30 p.m.

- Robert R. Scott, Commissioner
  NH Department of Environmental Services
- John J. Boisvert, CEO/Chief Engineer
  Pennichuck Water
- James Houle, Research Assistant Professor, Director
  UNH Stormwater Center

LaBelle Winery
345 Route 101,
Amherst, NH

Nashua Regional Planning Commission | (603) 417-6570 | nashuarpc.org

Nashua Regional Planning Commission 39th Annual Forum

Bob Scott
NHDES Commissioner

May 8, 2024

NEW HAMPSHIRE DEPARTMENT OF
Environmental Services

Drinking Water Funding FY21 – FY26

Traditional DWSRF Funding – EPA & Repayment $15-20M
Drinking Water & Groundwater Trust Fund $20M

<u>**New Funding**</u> - $555M additional funds for FY21-26

- ARPA $190M (one time funding/now mostly committed)
- PFAS ARPA $25M
- PFAS Remediation Loan Fund $60M
- 22-26 DWSRF Emerging Contaminant $40M
- 22-26 Lead Service Line SRF $140M
- 22-26 Supplemental SRF $112M
- 22-26 BIL Small/Disadvantaged Water Systems Emerging Contaminant $50M
- WIIN Lead & Disadvantaged $3M

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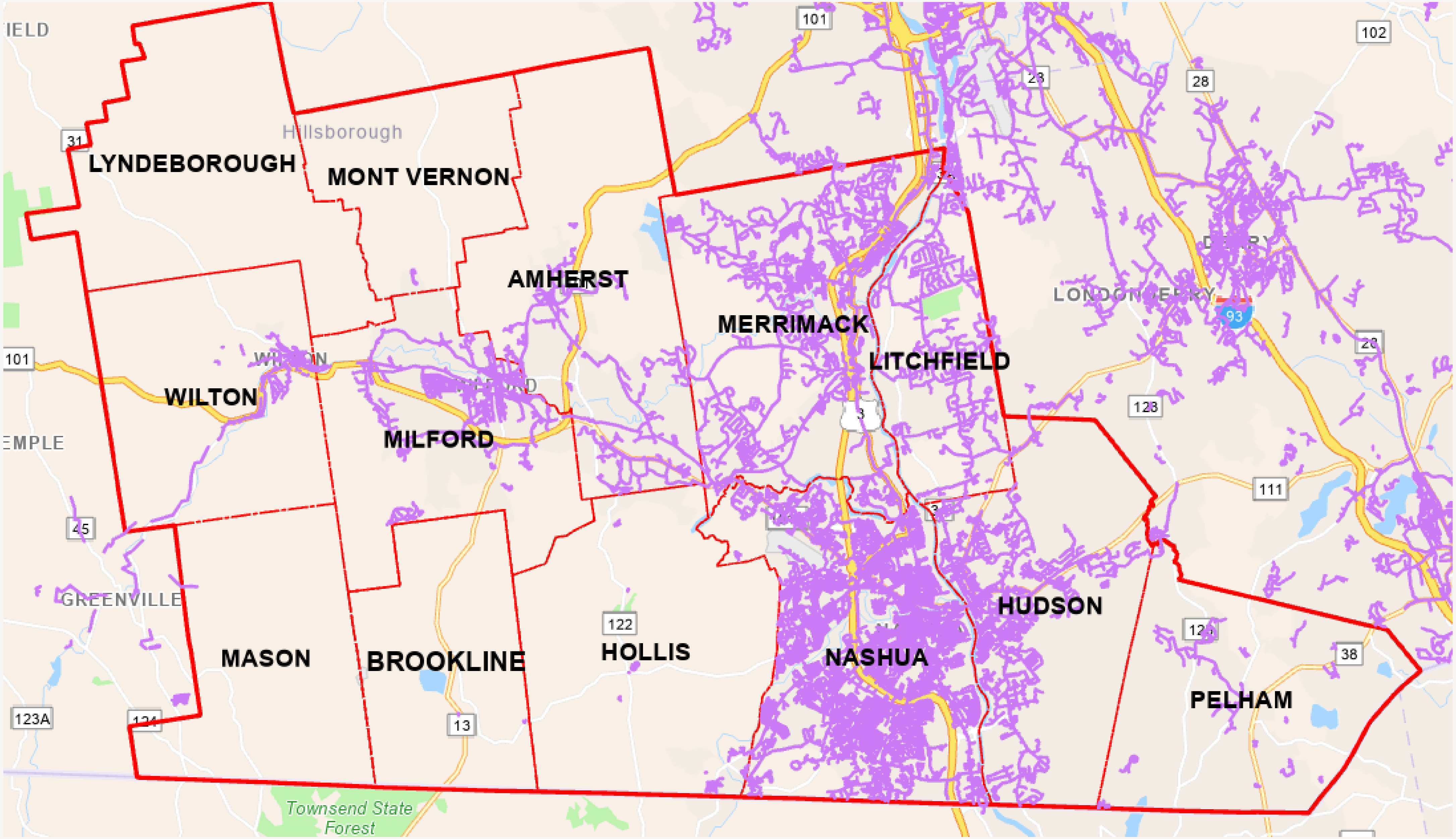
Funding for Drinking Water For the NRPC Member Municipalities - 2017 - Present

Approximately **$58M** in grants and loans have been awarded to water systems and municipalities since 2017.

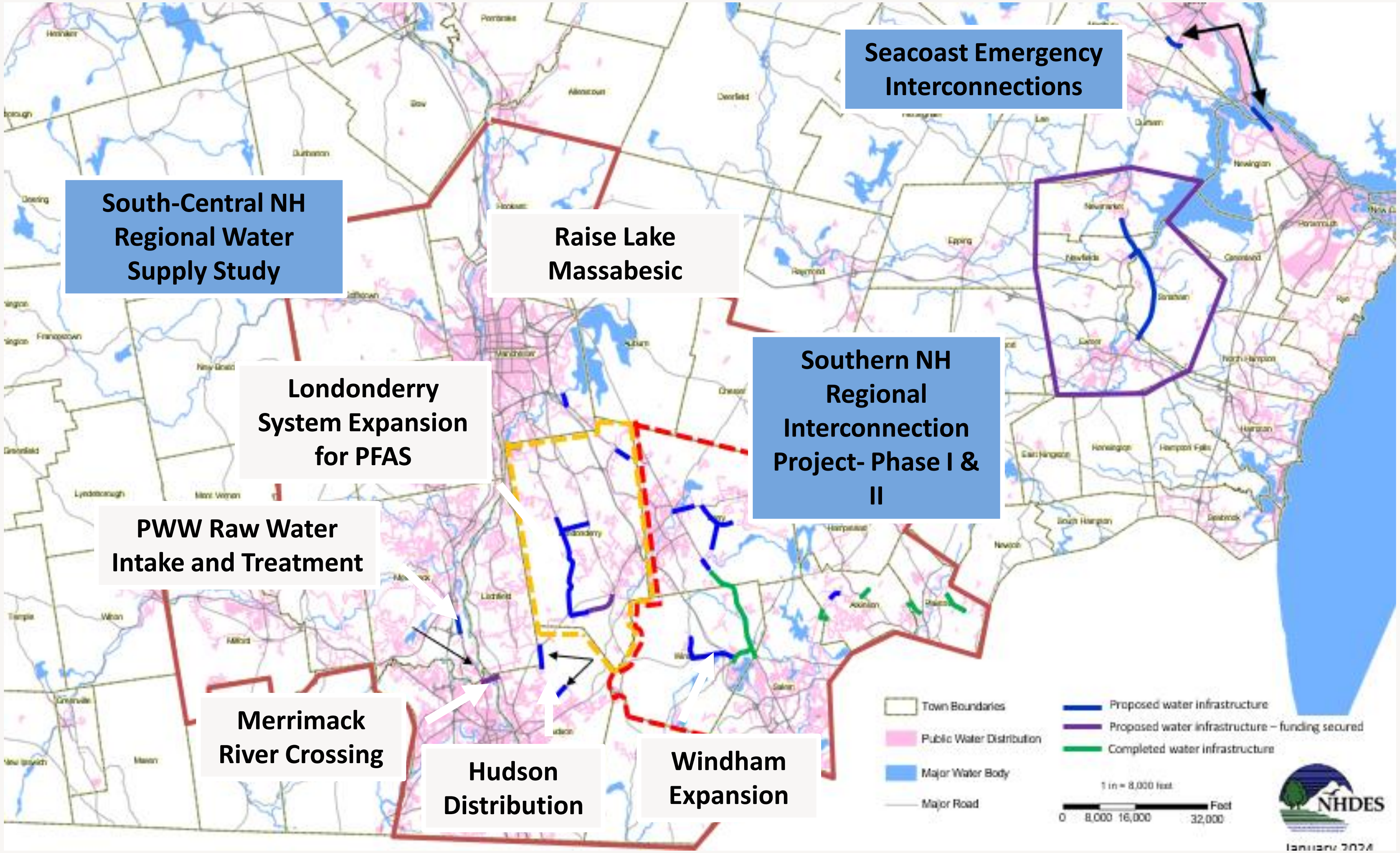
- Infrastructure investments
- PFAS contamination
- Source water protection
- Lead service lines
- Asset management
- Planning Grants

Funding came from SRF, Trust Fund, ARPA, PFAS Response Fund

NRPC Areas Served by Community Water Systems



Regional Map of Water Projects

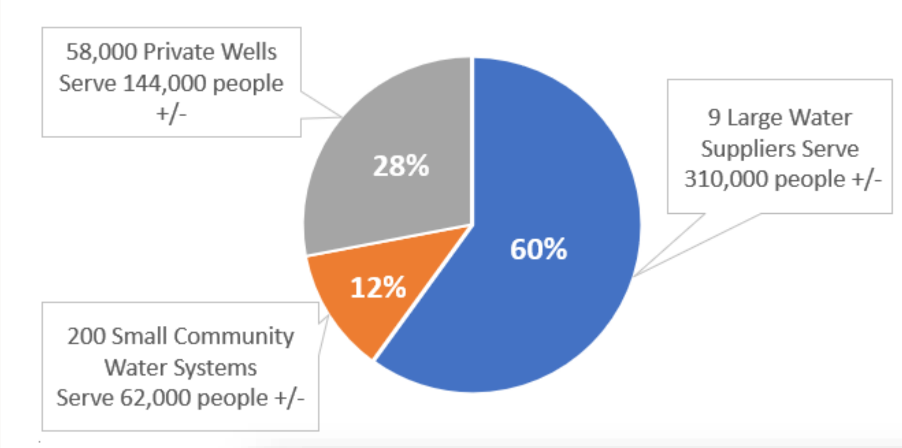


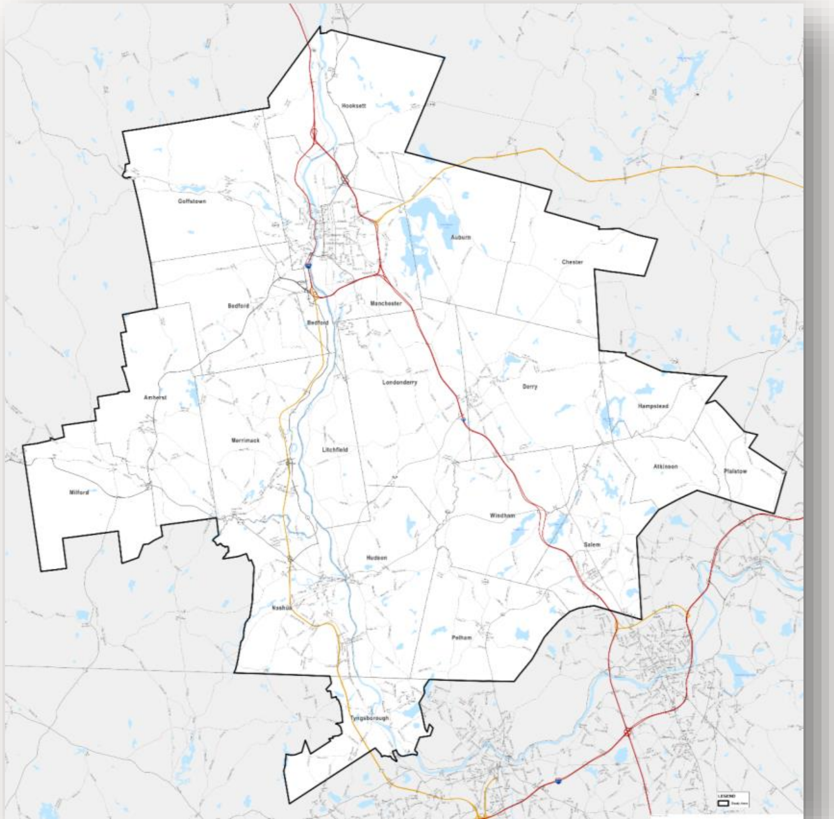
Merrimack River Crossing - $9.7M appropriation

Funded Hudson study – Sept 24 report

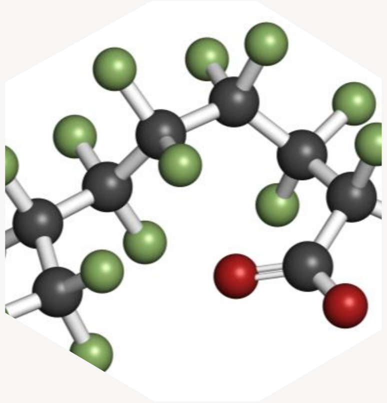
South- Central NH Regional Water Supply Study

- 516,000 people (40% of total NH population)
- 21 communities
- 9 large water suppliers
- 200+/- small community water systems
- 60,000+/- private wells
- Projected Water Demand (Usage) Year 2040: **87 million gallons per day**
- Regional Supply Capacity: **89 million gallons per day**
- 3 Alternatives Evaluated
  - Primarily transmission to get water from major suppliers to communities with projected shortfalls
  - **$106 million to $140 million** estimated cost

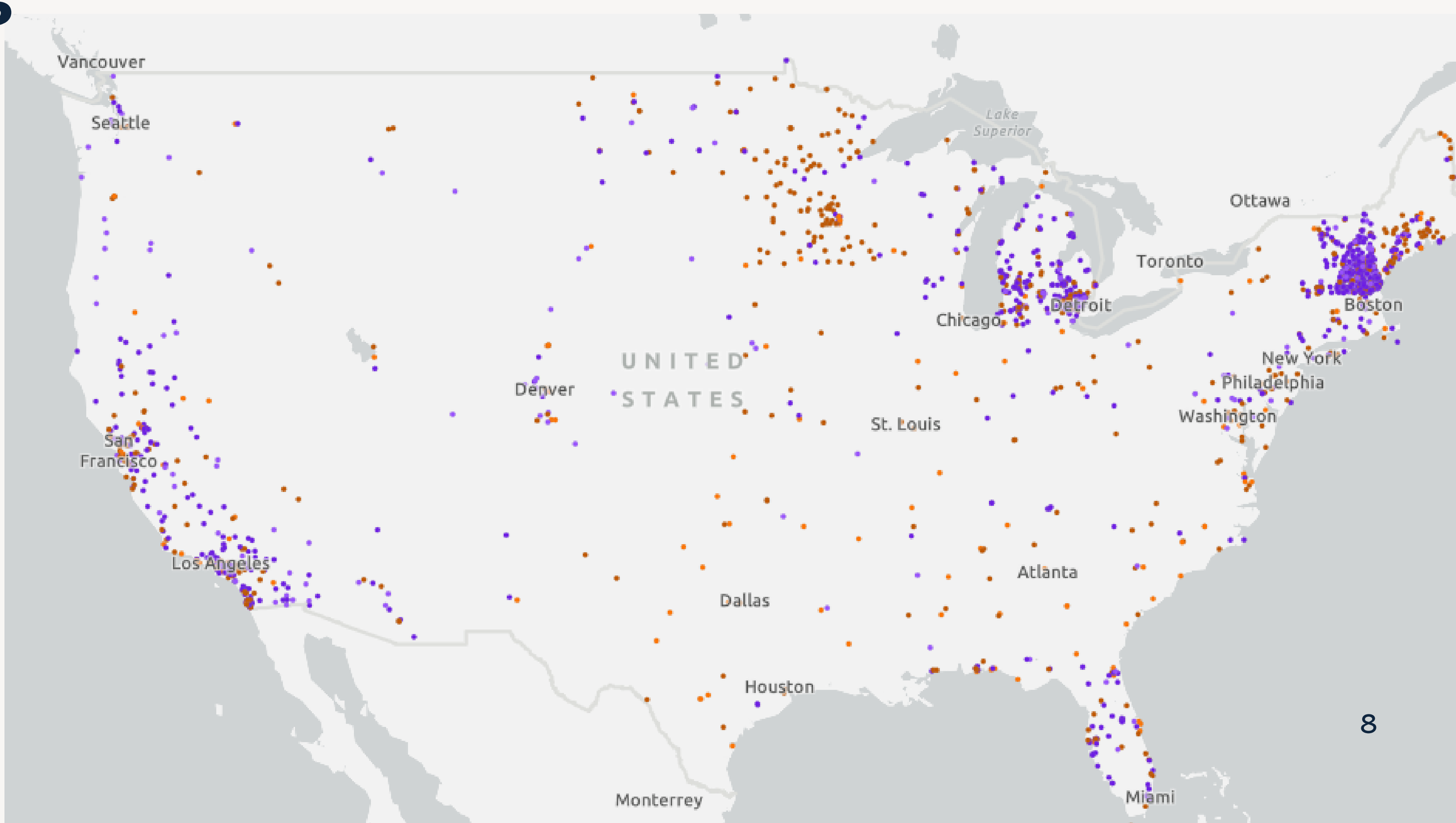




PFAS



- New EPA standards
- BIL, SRF, emerging contaminates funding
- Soil/sludge standards
- Private well rebate program
- AFFF take back program



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PFAS Private Well Sampling

- 12,500 wells statewide
  - 3,500 > NHMCL
  - 7,100 > EPAMCL
- 3,200 wells within NRPC Communities
  - 1,200 > NHMCL
  - 2,100 > EPAMCL

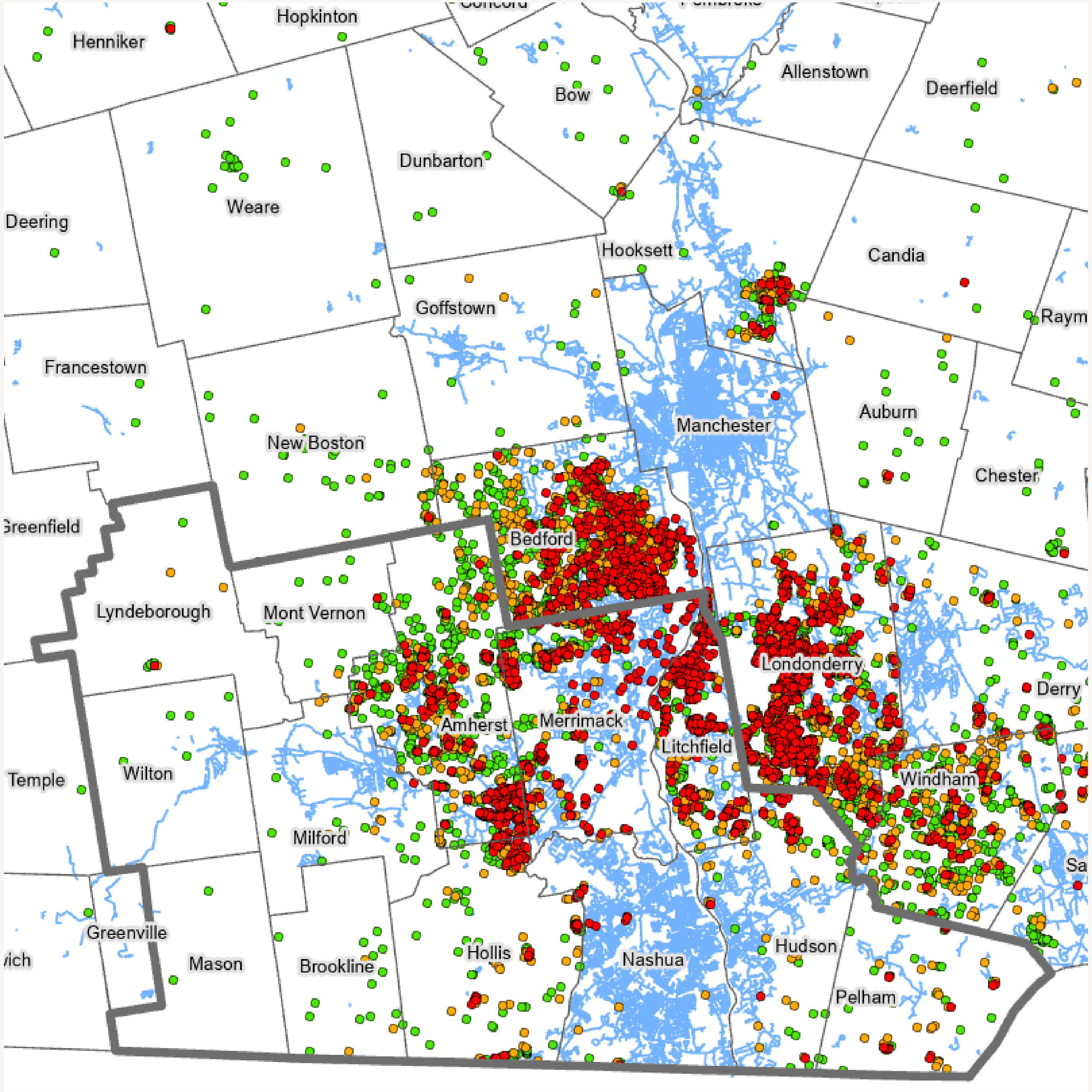
> NH MCL

< NHMCL and > EPA MCL

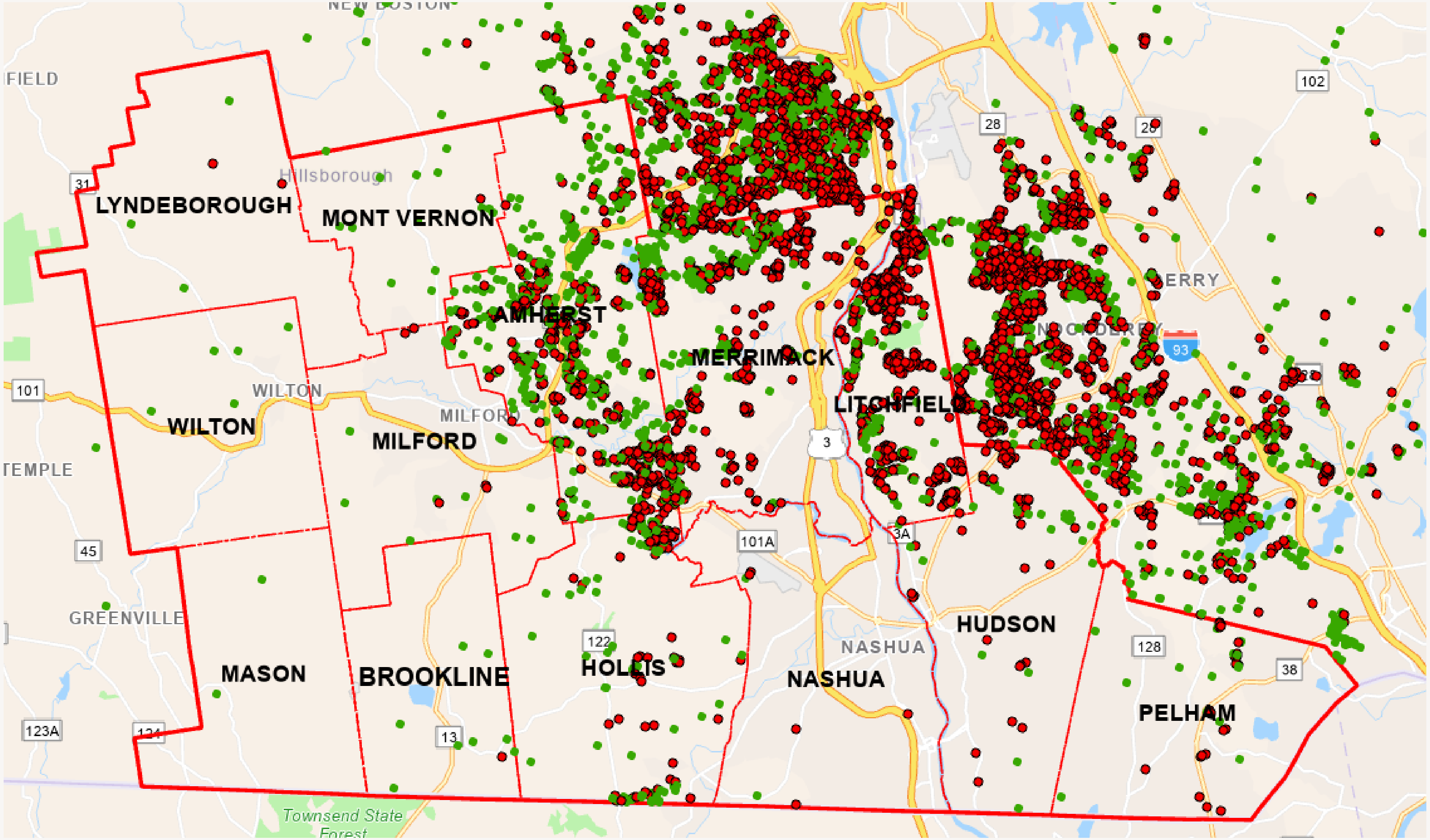
< EPA MCL

Public Water Distribution

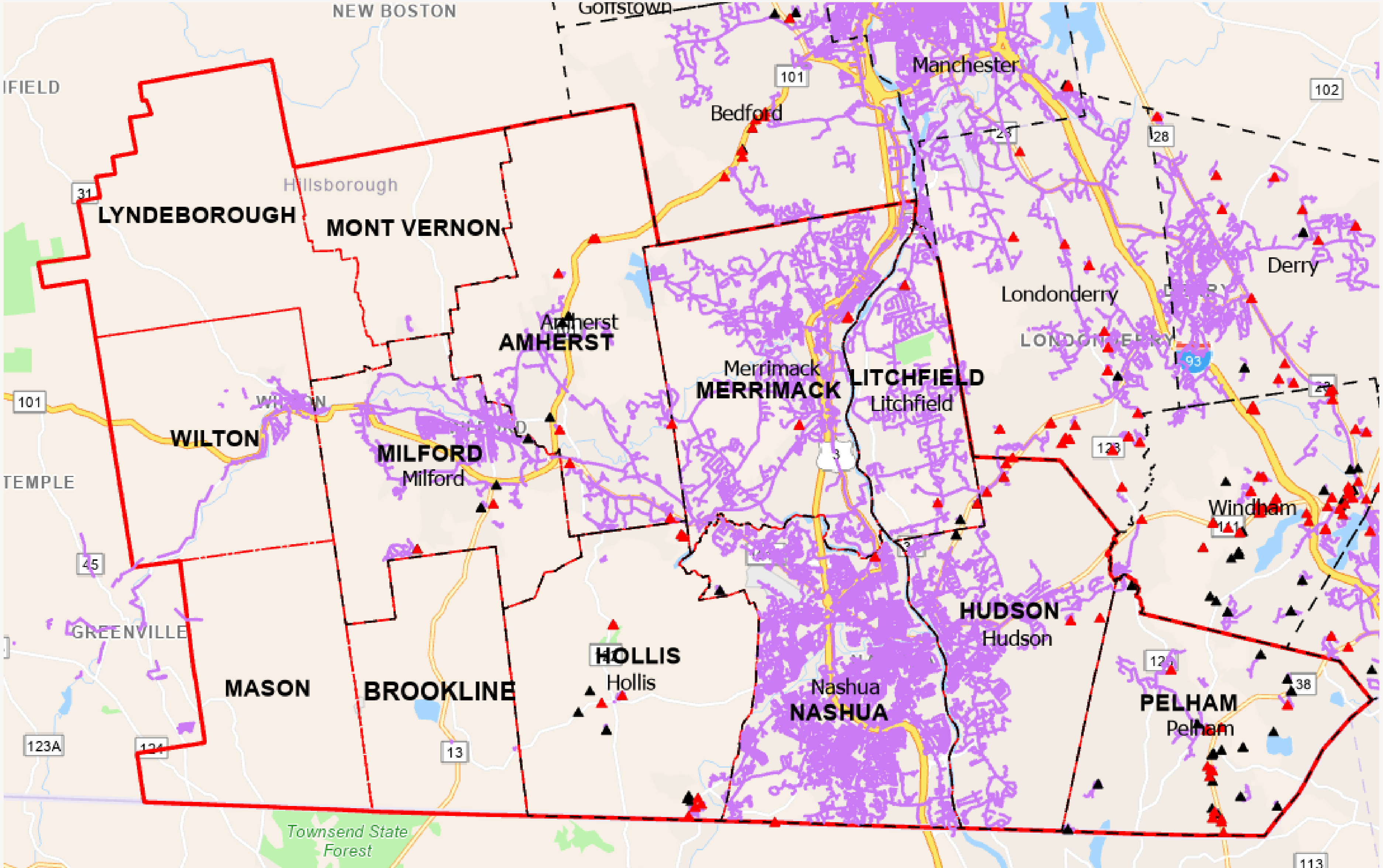
NRPC Region



Private Wells Exceeding USEPA's New MCL for PFOA (4 ppt)



Community Water Systems Exceeding USEPA's New MCL for PFOA of 4 Parts-Per-Trillion



PFAS > 4 ppt

PFAS < 4 ppt

Southern NH Regional Interconnection Study 2024-2025

- Holistically assess PFAS contamination for small standalone decentralized community water systems and assess the viability of extending water from a large system to mitigate PFAS contamination

- Millions of dollars are about to be spent to address PFAS contamination and public water systems.

- Funds can be invested inefficiently in a piecemeal form to install 100+ isolated treatment systems that are costly and complex to sample, maintain and repair for decades to come.

OR

- Develop a vision for its water supply infrastructure needs and address PFAS contamination while at the same time leveraging these funds to develop reliable and sustainable infrastructure to meet the needs of the residents today and benefit the community for the future.

- **Have a vision now so there are no regrets later.**

PFAS Removal Private Well Rebate Program

A one-time rebate of up to **$5,000** for the installation of PFAS treatment;
or up to **$10,000** for a service connection to a public water system.

- ~$13M in available funding
- Merrimack has their own program

Other Challenges for Drinking Water

- Anthropogenic contamination
  - Chlorides/road salt
- Naturally occurring
  - Arsenic
  - Manganese
- Cyanobacteria
- Drought

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Environmental Services

Local planning – Common Challenges

- Lack of planning for infrastructure maintenance needs
- Development desires not matching infrastructure
- Many not prepared to take advantage of ARPA, BIL, IRA funding

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Questions?

NEW HAMPSHIRE DEPARTMENT OF
Environmental Services

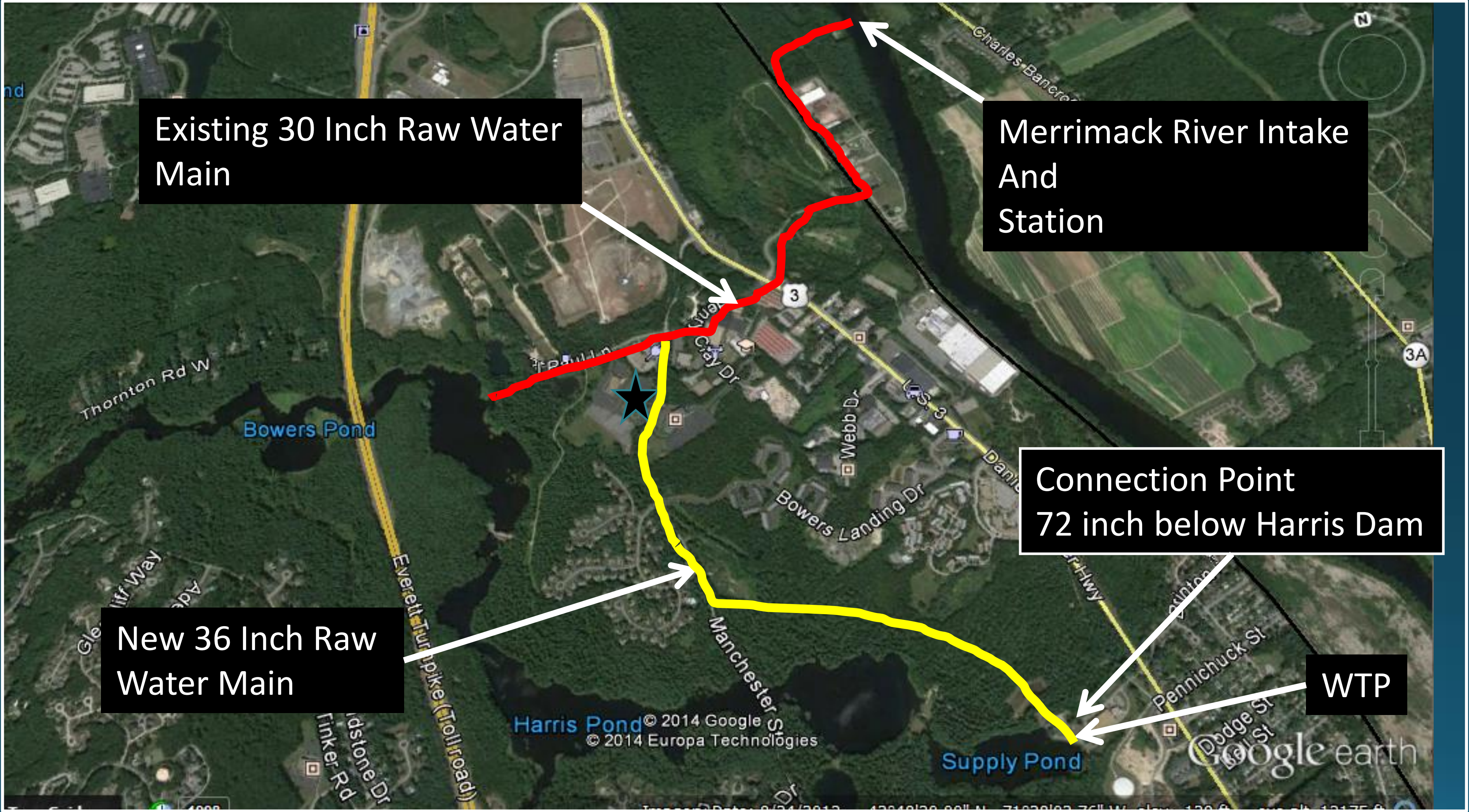
John J. Boisvert, P.E.
CEO/Chief Engineer
Pennichuck Water

NRPC 39th Annual Forum

Outline

- Supply: Source Risk and Risk Mitigation
- Merrimack River Source
- Source Water Monitoring
- Regional PFAS Response
- Climate Change and Water Quality

Merrimack River Intake & Raw Water Pipeline

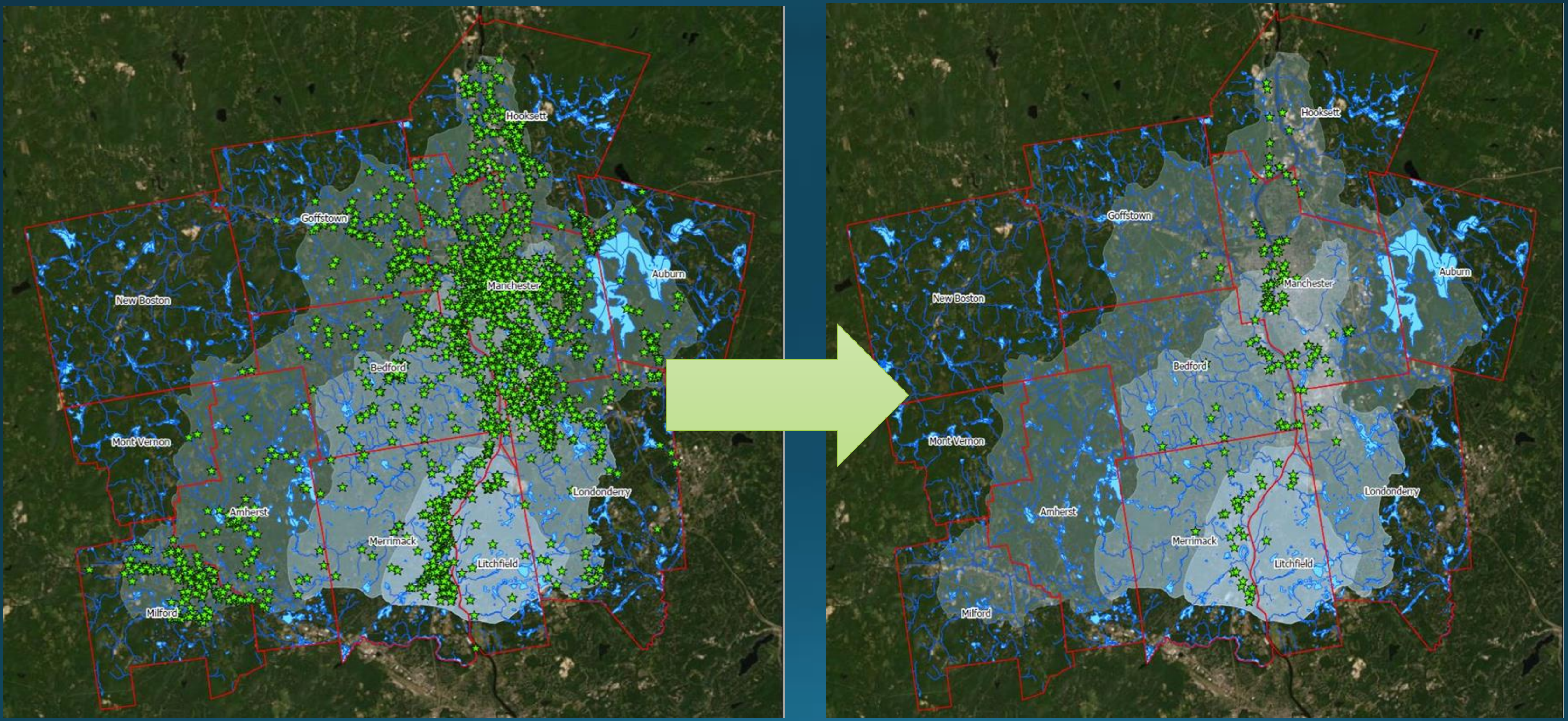


Merrimack River Intake

Transition to a New Supply: 2020-Present

- Merrimack River Deep Water Intake was completed in 2020, and activated in spring of 2021
- Brook v. River: Two different water qualities
  - River is flashier with higher turbidites and NOM
  - More susceptible to changing weather events

Potential Risks v. Risks of Interest

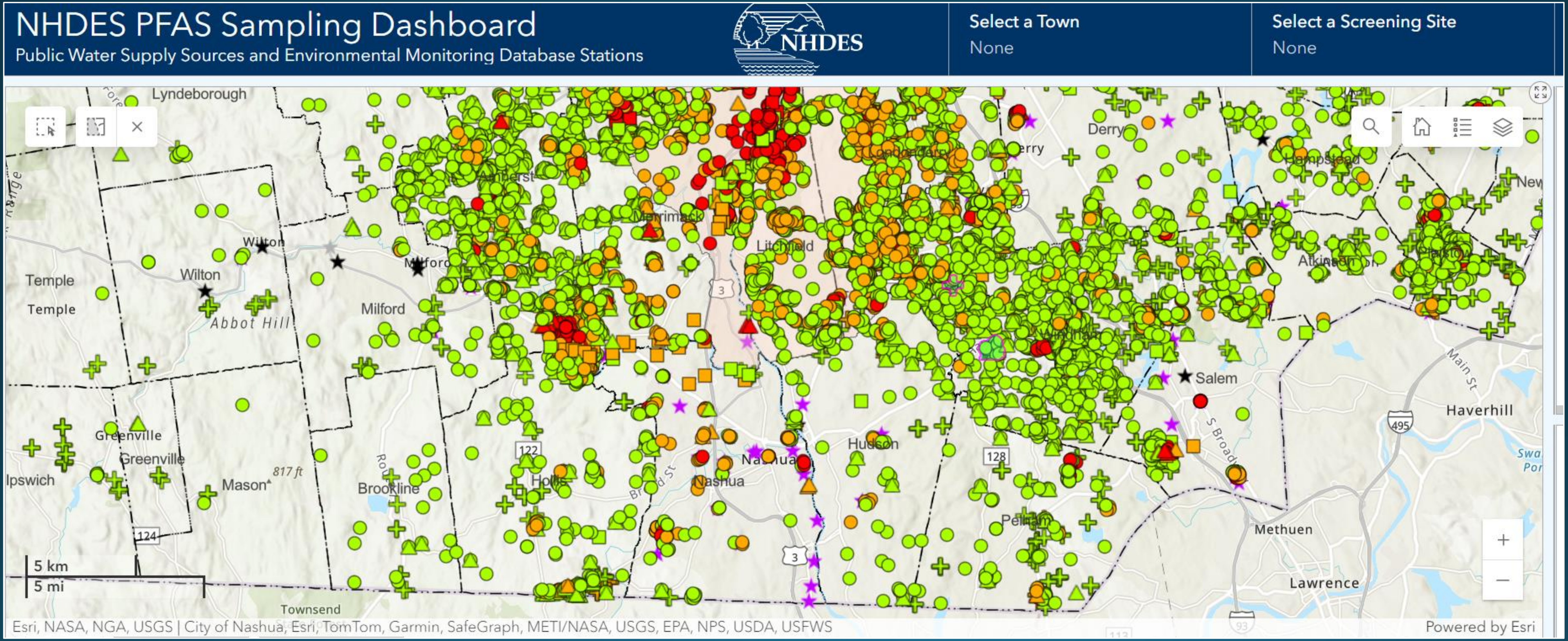


PFAS – EPA 2024 "Far right of the decimal" 0.000000000010

PFAS	MCL (ng/L or ppt*)	Significant Figure Requirement	Rounding for Reporting Example
PFOA	4.0	2	Running annual average value (RAA) of 4.04 ng/L = round to 4.0 ng/L = **Compliance** RAA of 4.05 ng/L = round to 4.1 ng/L = **Exceedance**
PFOS	4.0		
PFNA	10	1	RAA of 14.9 ng/L = round to 10 ng/L = **Compliance** RAA of 15.0 ng/L = round to 20 ng/L = **Exceedance**
PFHxS	10		
GenX	10		
PFNA, PFHxS, GenX, and PFBS (Mixture)	HI Value of 1 (Unitless)	1	RAA of 1.49 = round to 1 = **Compliance** RAA of 1.50 = round to 2 = **Exceedance**

**Maximum Contaminant Level (nanograms per liter or parts per trillion)*

Perfluoroalkyl Substances (PFAS) in South/Central NH



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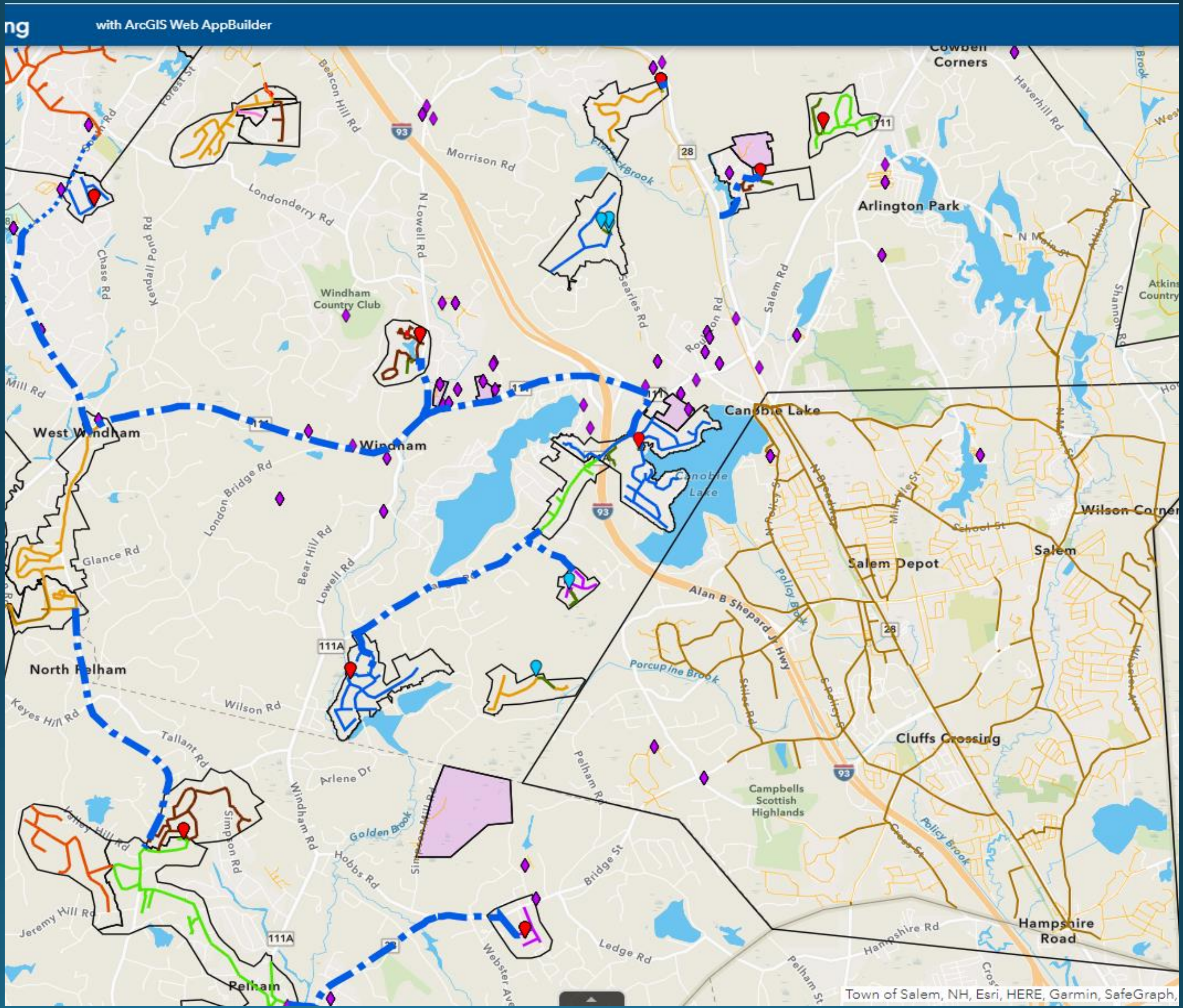
Addressing PFAS's Impact

- 2023 Evaluation of the new rule impact
- Identified 23 Pennichuck systems that would need treatment or interconnections
- 75 (=/-) more community water systems impacted.



Climate Change and Water Quality

Changes in weather…

More intense storms, severe droughts, less consistency in weather pattern

Lead to changes in water quality…

Higher turbidities, more natural organic matter, all of this “stuff” in the water

Lead to changes in operation…

We need to use more coagulant to remove the “stuff”

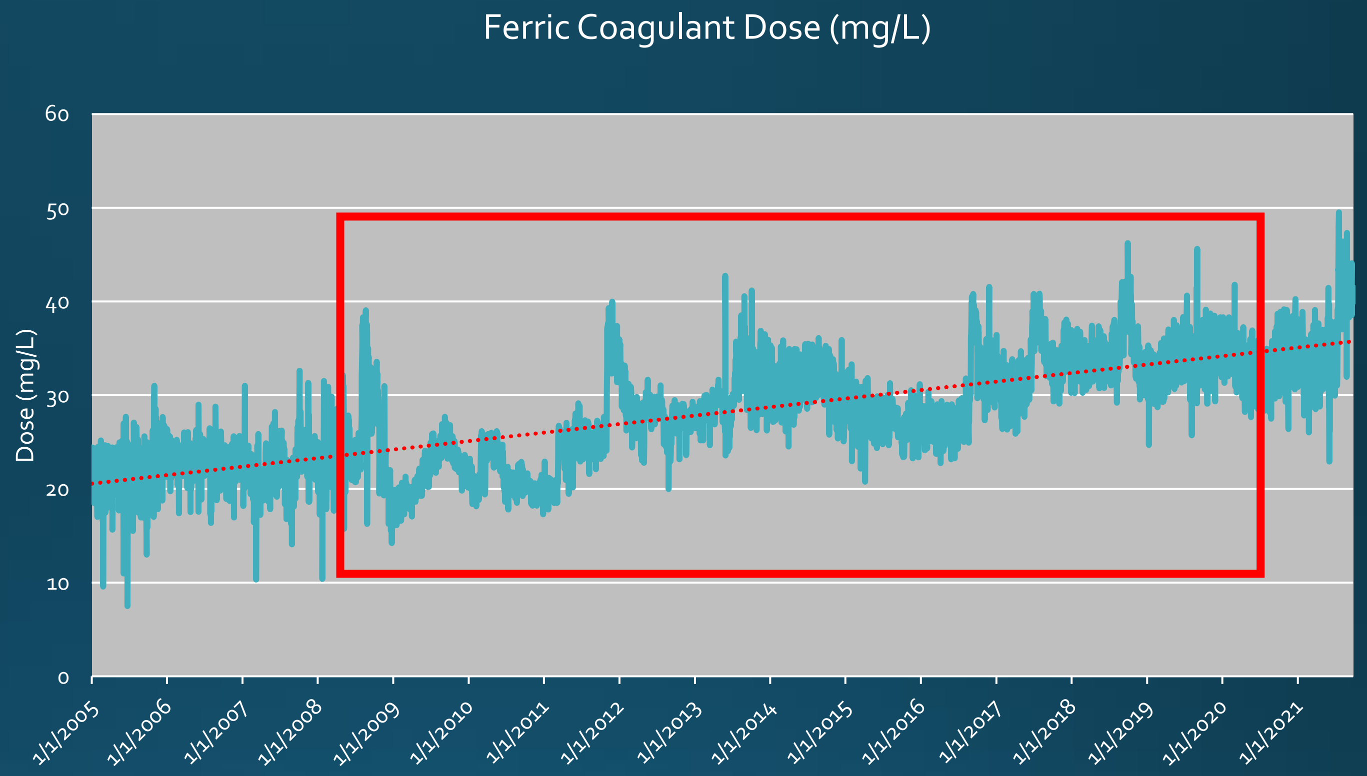
The results…

The need for an increase in chemical storage capacity

2005

to the

Present



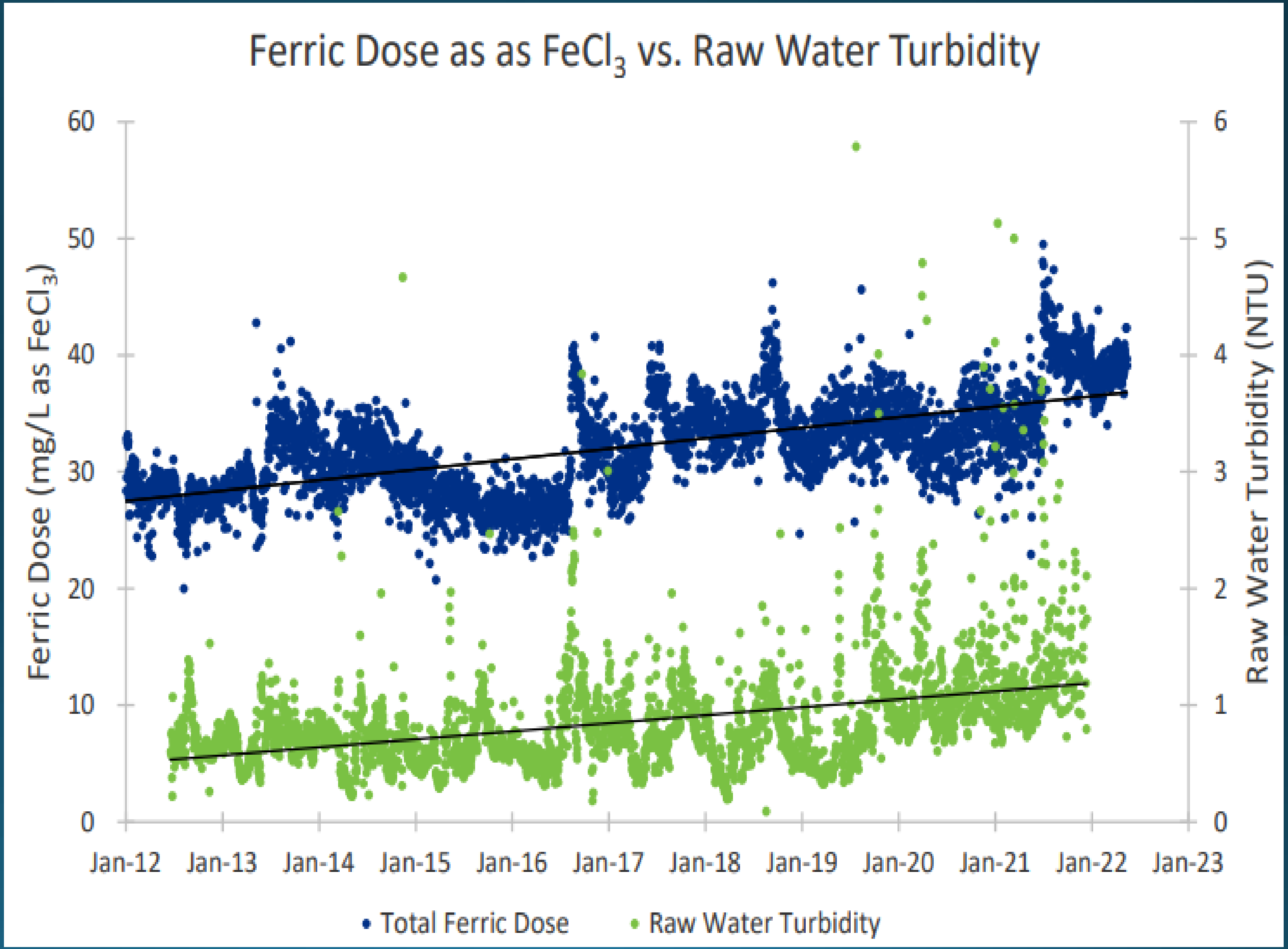
Relative stability after the initial learning curve, but things begin to change

More extreme weather, droughts, floods, more sediment entering out pond system

Higher turbidities, and increasing coagulant doses are a result

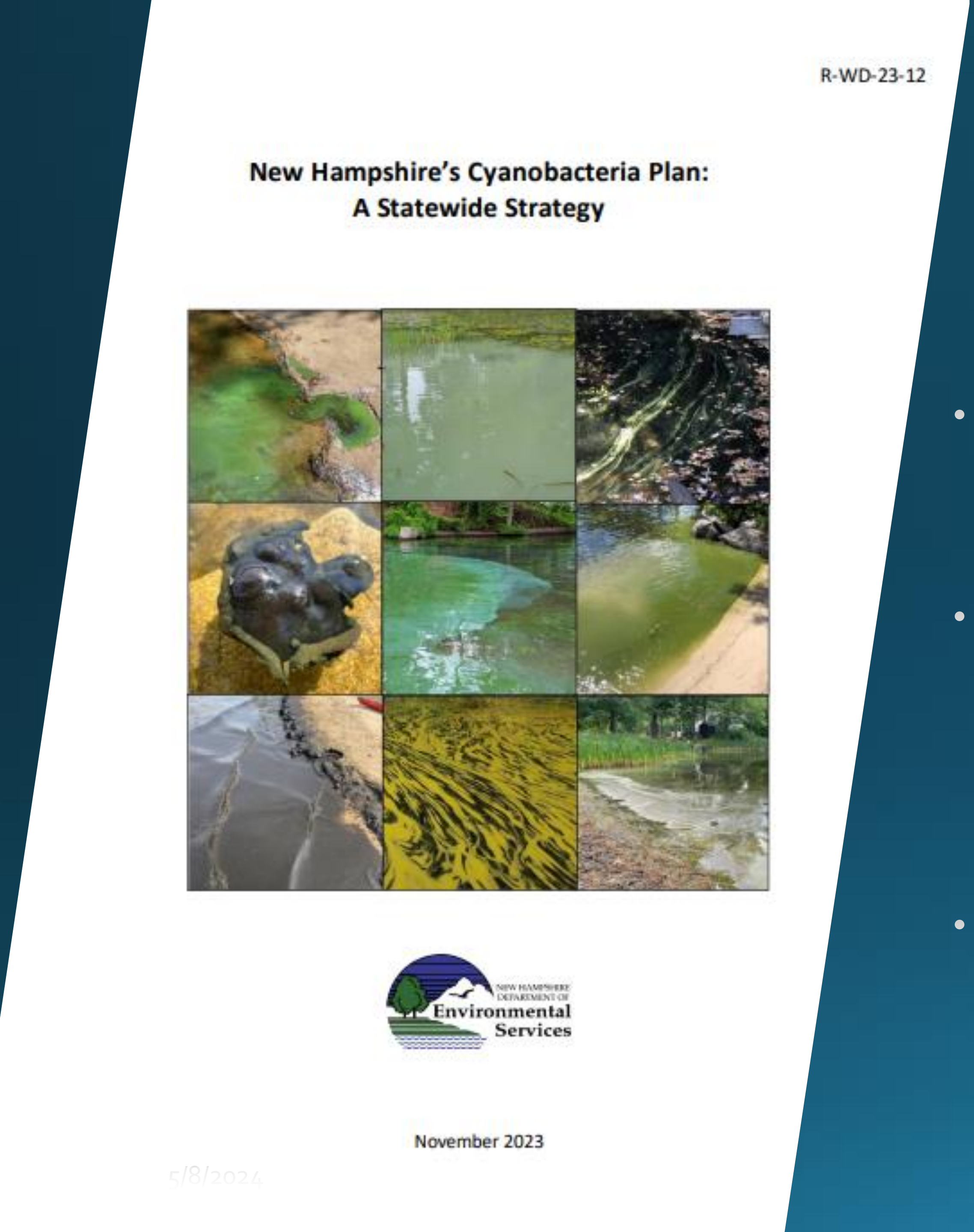
Ferric Dose and Turbidity

Focus on the last two years, large spike in turbidity = large spike in chemical usage



Cyanobacteria

- What is it?
  - Single cell micro-organism, "Bluegreen algae"
  - Produces a variety of toxins: neurotoxin, hepatoxin
  - Some of the first organisms on Earth, but recently increasing in number due to climate change and human impacts



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New Hampshire's Cyanobacteria Plan:
A Statewide Strategy

November 2023

Cyanobacteria: The State's Push Towards Regulation

- PWW staff have been working closely with NHDES:
  - New plans for existing systems, Locke Lake and WTP
- Locke Lake is monitored consistently throughout production season (October-June)
  - Routine sampling
  - Constant monitoring using a sonde
  - Visual inspections
- 2023 document outlining the NHDES plan for regulation
  - Push back; wait and see

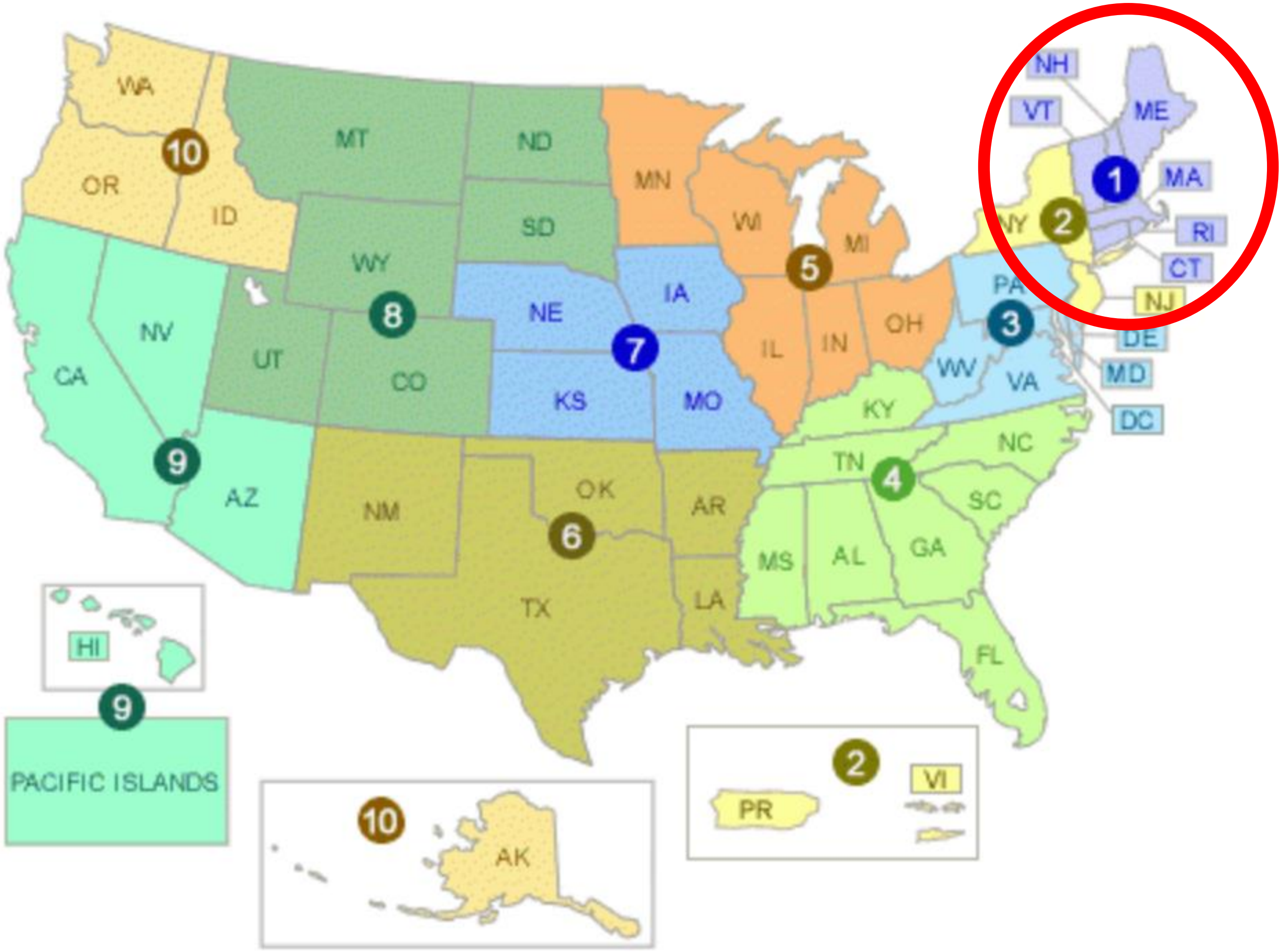
James Houle
UNH Stormwater Center

Planning to Implementation

- TMDLs, while legal and binding have a mixed track record
- There is changing and ever improving science
- Much of the old pollutant loading has changed.
- Rainfall hydrology is dynamic and shifting as well.

EPA Region 1 Context

- New England is HIGHLY developed – we’re seeing primarily re-development and managing new IC is NOT doing enough to improve water quality – also need to do retrofits



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Regulatory Drivers of Water Quality in New England

- Multiple permits, ordinances, regulatory documents guiding water quality in Region 1
  - MS4 Permits
  - TS4 Permits
  - Consent Decrees
  - TMDLs
- **EPA can use its "residual designation" authority under 40 CFR 122.26(a)(9)(i)(C) and (D) (PDF) to require NPDES permits for other stormwater discharges or category of discharges on a case-by-case basis**

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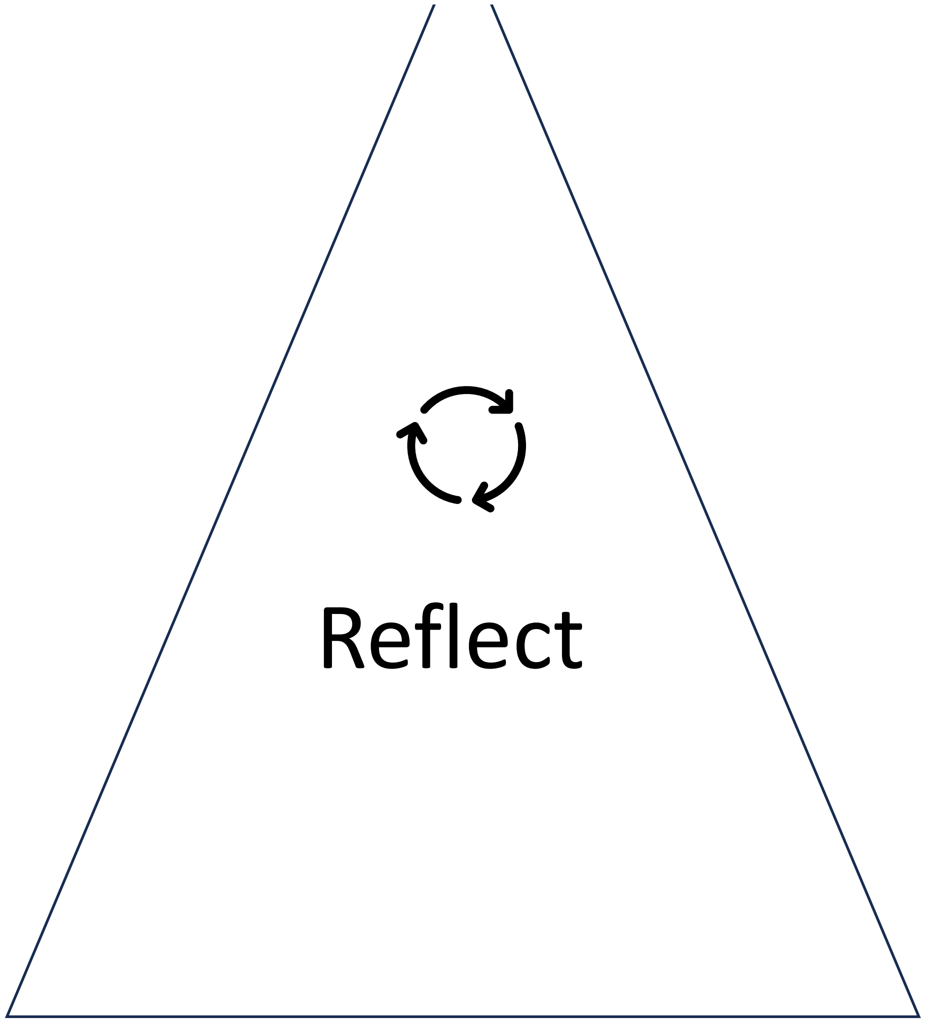
Traditional Approach?

To 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)

Build: Millions have been committed over the next 5 years to implementation



Adapt: New credits and load reduction methods are currently being investigated

Measure: Millions been committed to research, tracking and accounting

NH MS4 Coalitions/Municipal Alliance for Adaptive Management (MAAM) partners

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PREP™
Piscataqua Region Estuaries Partnership

NEW HAMPSHIRE
DEPARTMENT OF
Environmental
Services

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

clf
Conservation
Law Foundation

Over the Rainbow

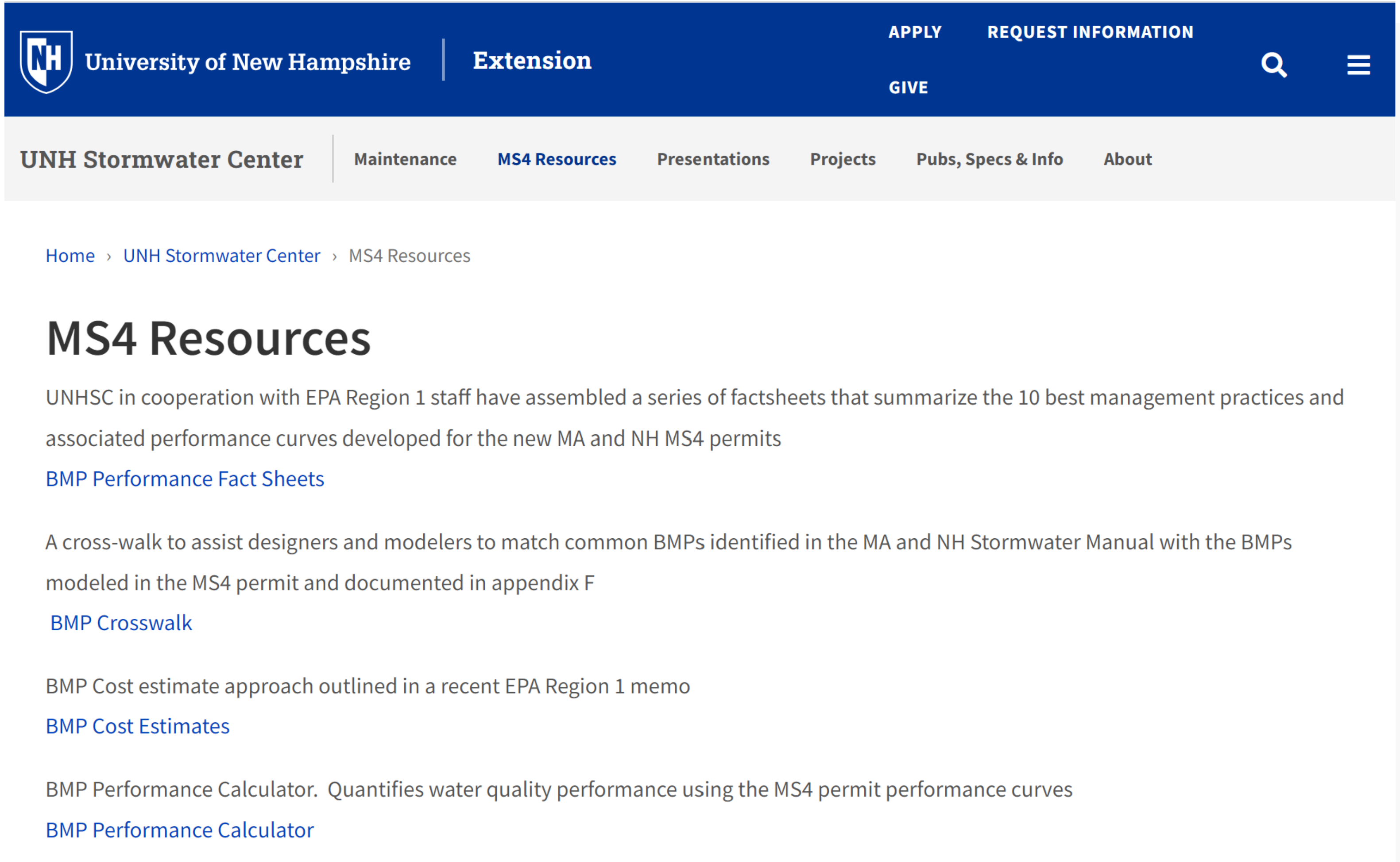
- There are numerous accounting and tracking efforts underway in the east
- Chesapeake Bay Nutrient TMDLs
- VT DEM - Lake Champlain Phosphorus Controls
- Long Island Sound Nitrogen TMDL
- Pollutant Tracking and Accounting Project (PTAP)
- Charles River Phosphorus Control Plans
- Part of updated MS4 permits (Appendix H and F)

PTAP

- UNHSC and UNH Computing Services has developed an online Tracking and Accounting tool for use toward permit compliance:
- https://ptapp.unh.edu/

Helpful Resources

- https://extension.unh.edu/stormwater-center/ms4-resources



University of New Hampshire | Extension

APPLY REQUEST INFORMATION

GIVE

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Home › UNH Stormwater Center › MS4 Resources

MS4 Resources

UNHSC in cooperation with EPA Region 1 staff have assembled a series of factsheets that summarize the 10 best management practices and associated performance curves developed for the new MA and NH MS4 permits

BMP Performance Fact Sheets

A cross-walk to assist designers and modelers to match common BMPs identified in the MA and NH Stormwater Manual with the BMPs modeled in the MS4 permit and documented in appendix F

BMP Crosswalk

BMP Cost estimate approach outlined in a recent EPA Region 1 memo

BMP Cost Estimates

BMP Performance Calculator. Quantifies water quality performance using the MS4 permit performance curves

BMP Performance Calculator

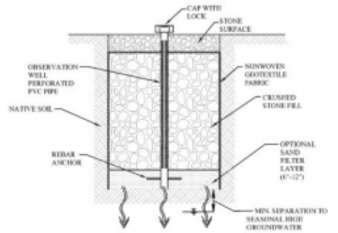
Nomographs

Infiltration Trench Factsheet

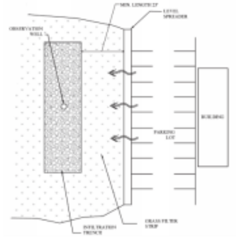
Infiltration Trench is a practice that provides temporary storage of runoff using the void spaces within the soil/sand/gravel mixture that is used to backfill the trench for subsequent infiltration into the surrounding sub-soils. Performance results for the infiltration trench can be used for all subsurface infiltration practices including systems that include pipes and/or chambers that provide temporary storage. Also, the results for this BMP type can be used for bio-retention systems that rely on infiltration when the majority of the temporary storage capacity is provided in the void spaces of the soil filter media and porous pavements that allow infiltration to occur. General design specifications for infiltration trench systems are provided in the most recent version of *The New Hampshire Stormwater Manual, Volume 2: Post-Construction Best Management Practices Selection and Design*.

Sample Design

Cross Section



Plan View



Examples images from the *New Hampshire Stormwater Manual, Volume 2*, p. 86

Pollutant Export Rate by Land Use[1]

Source Category by Land Use	Land Surface Cover	P Load Export Rate[1] (lbs./acre/year)	N Load Export Rate[2] (lbs./acre/year)
Commercial (COM) and Industrial (IND)	Directly connected impervious	1.78	15
Multi-Family (MFR) and High-Density Residential (HDR)	Directly connected impervious	2.32	14.1
Medium-Density Residential (MDR)	Directly connected impervious	1.96	14.1
Low-Density Residential (LDR) - "Rural"	Directly connected impervious	1.52	14.1

[1] From NH Small MS4 General Permit, Appendix F

General Equations

Physical Storage Capacity: Depth of Runoff * Drainage Area
Cost: Physical Storage Capacity * Cost Index * Adjustment Factor[1]
Yearly Pollutant Removal: Pollutant Load Export Rate * Drainage Area * Efficiency

Cost

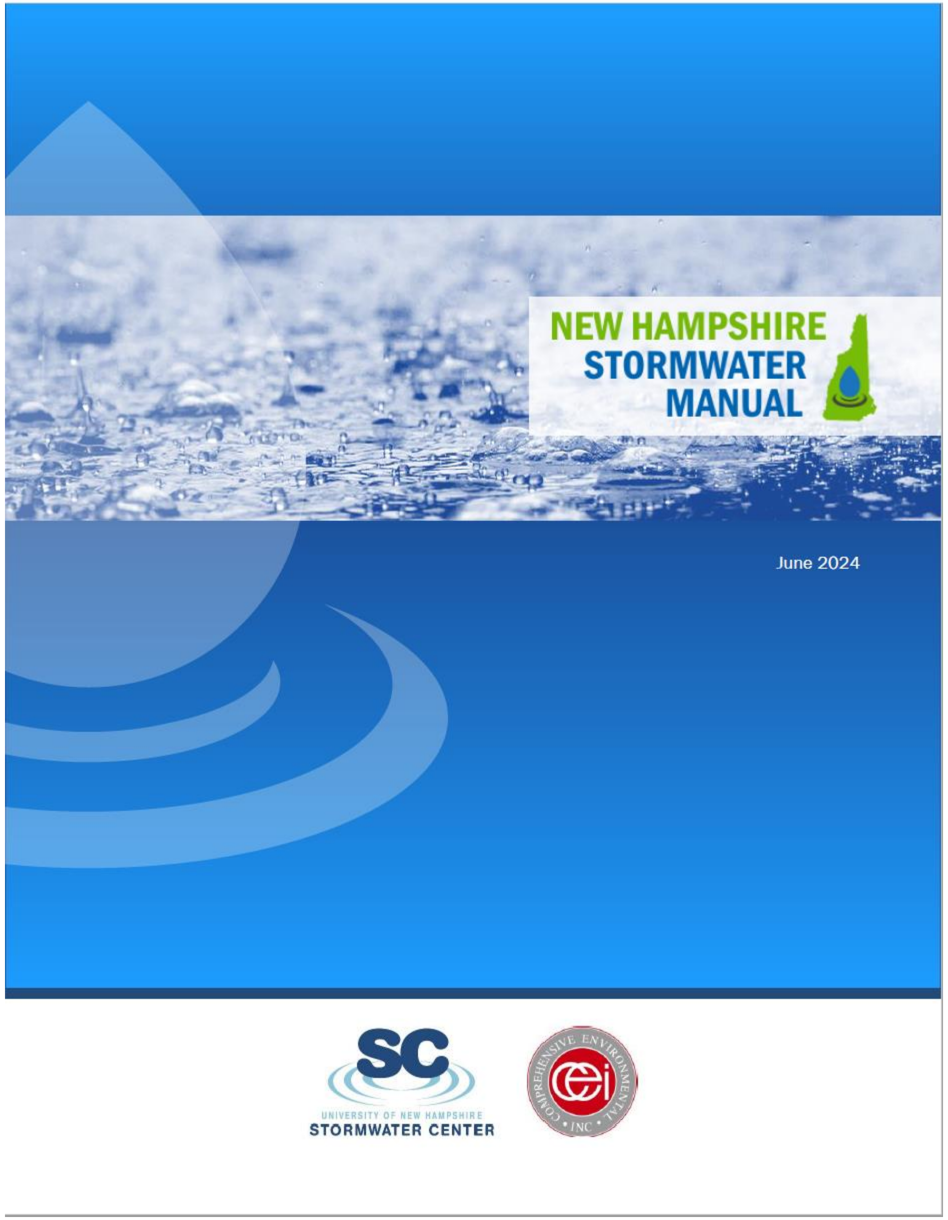
- https://scholars.unh.edu/stormwater/119/

A New Manual for NH

- A New Stormwater Manual for NH is currently in the final stages of development.
- It is set to come out this Fall
- It will represent the state of the practice based on the best available science

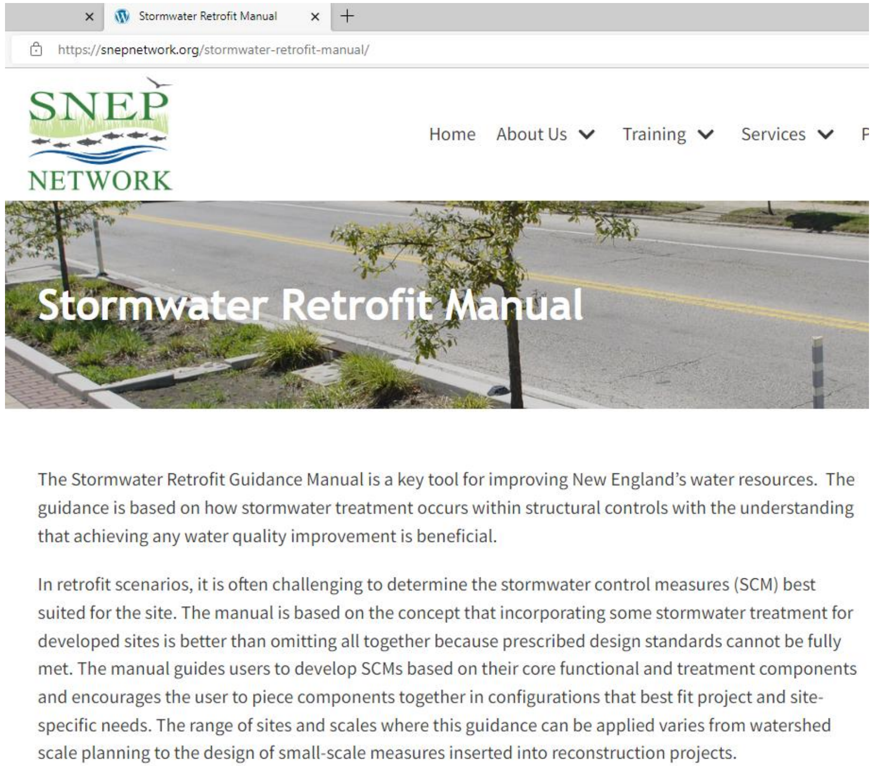
As the science and available technologies for stormwater management are constantly evolving, the state-of-the-practice may in some cases be "a step ahead" or differ from regulatory requirements and related design criteria which are only updated periodically. **Chapters 4 and 5 and the SCM Fact Sheets (Appendix A)** of this Manual describe stormwater management design criteria calculations and site planning and design with state-of-the-practice in mind while relating these criteria to specific AoT requirements, where appropriate.

Designers, property owners, and local jurisdictions are encouraged to manage stormwater based on the state-of-the-practice whenever possible. **The "plus" icon above is provided to aide users of this Manual in identifying where recommended design criteria may exceed or differ from state permitting requirements.** *Contact applicable regulatory programs (as described in this chapter) for the most up-to-date rules and regulations.*



Why A Stormwater Retrofit Manual

- Provide **research-based guidance** on planning, siting, and designing retrofit stormwater control measures (SCMs)
- Present an approach for **crediting pollutant and runoff volume reductions** associated with SCMs
- Help **overcome prescriptive design criteria** in constrained scenarios



Access the manual and supplemental resources here or use the QR Code:
https://snepnetwork.org/stormwater-retrofit-manual/

New England neefc Environmental Finance Center
SNEP Southeast New England Program
SC University of New Hampshire Stormwater Center
vhb