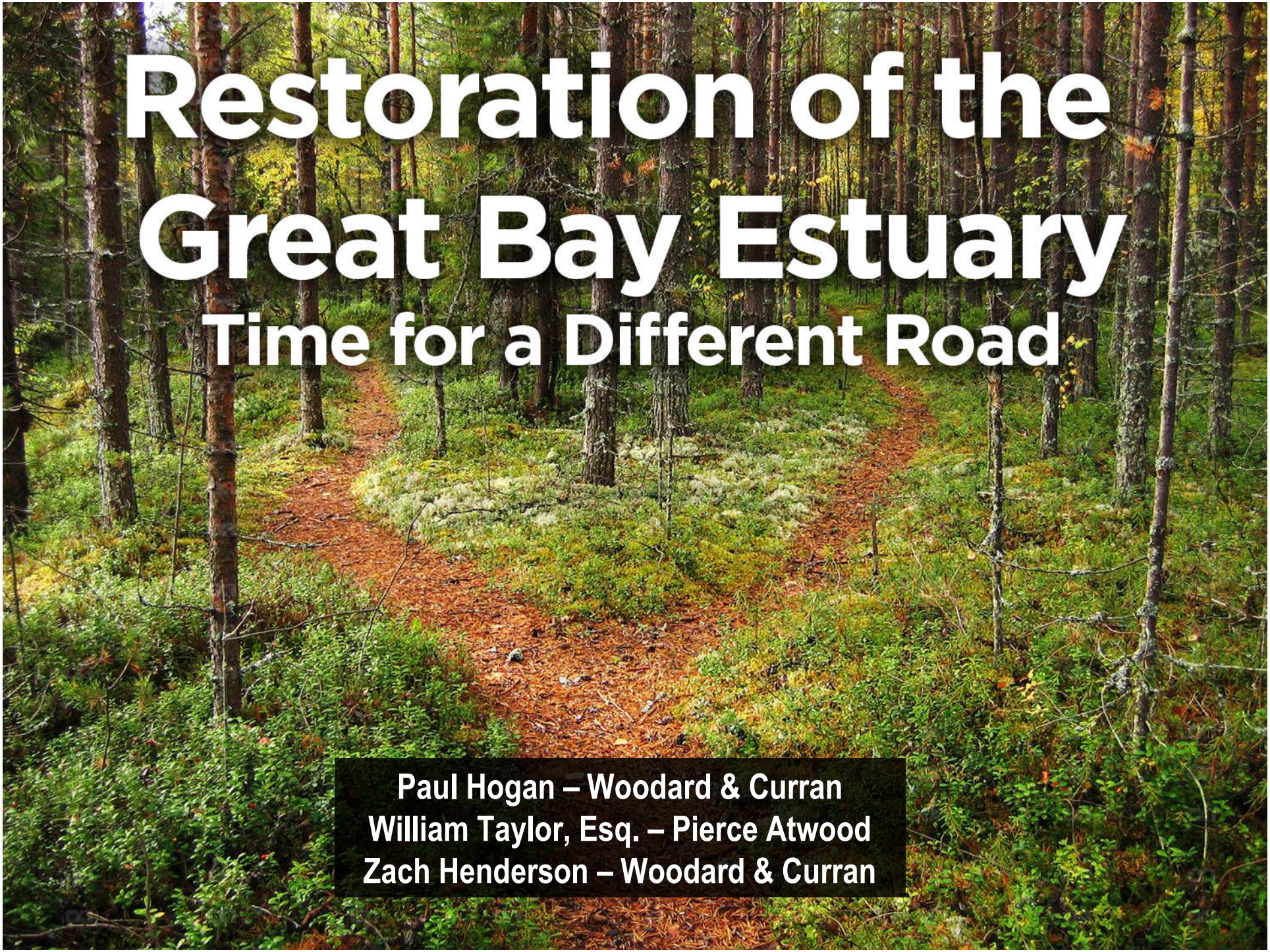
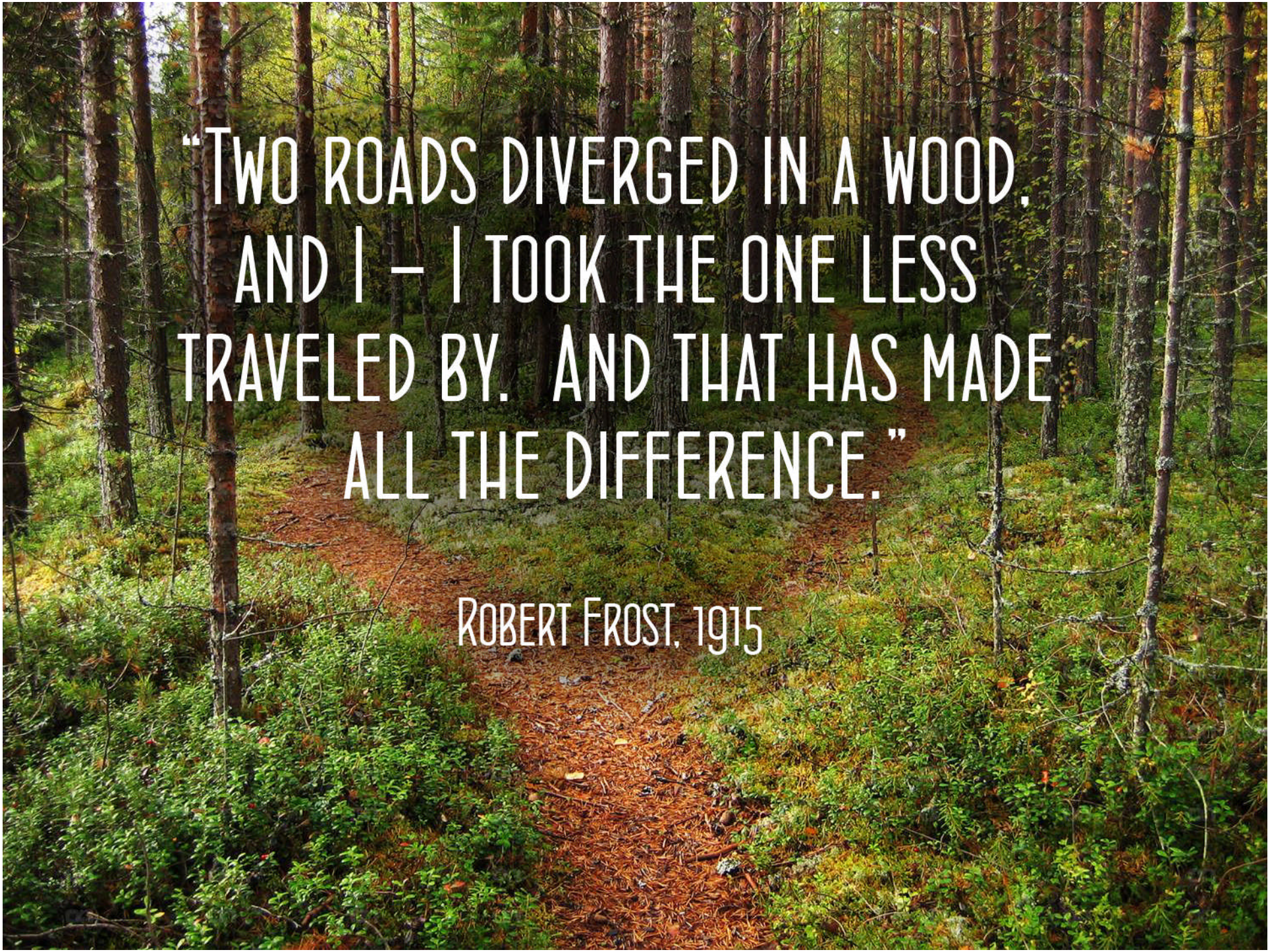

Restoration of the Great Bay Estuary
Time for a Different Road
Paul Hogan – Woodard & Curran
William Taylor, Esq. – Pierce Atwood
Zach Henderson – Woodard & Curran


"Two roads diverged in a wood.
and I – I took the one less
traveled by. And that has made
all the difference."
Robert Frost, 1915

Our Perspective….

- Great progress had been made in water quality improvements in past 40 years
- Great Bay is a “classic” watershed problem in today’s water quality dynamic
- Restoration - being the ultimate goal - will be difficult

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Algae Bloom in Chesapeake Bay, MD

Hot Stock Profiles


Amidst a backdrop of ongoing ecological change,
there is one constant – a strong commitment
to protect Great Bay and ensure that it remains a
natural treasure that can be enjoyed
by generations yet to come.
Great Bay National Estuarine Research Reserve, 2009 Anniversary Report
© RACHEL STEVENS PHOTO

What Have We Lost ?

- Eelgrass cover in the Great Bay itself has declined by 37% between 1990 and 2008 and has completely disappeared from the tidal rivers, Little Bay, and the Piscataqua River.

  - 2009 State of the Estuary – Environmental Indicators Summary

What Have We Lost ?

"In the 1970s, Great Bay was home to 1,000 acres of oyster reef…..

The coverage has dwindled to just 50 acres."

Conservation New Hampshire,
"Bringing a Reef Back to Great Bay,"
- June 2010

Photo: Oyster Harvesting, 1976

The Issues

- Loss of sufficient dissolved oxygen
- Significant loss of shellfish population
- Eelgrass loss
- Non attainment of designated use
- New WWTF Permits
- Potentially very costly solutions

Introduction to Great Bay, University of Vermont

The Regulatory Focal Point

- Excessive Nitrogen
  - Above proposed criteria of 0.45 mg/l & **0.30 mg/l**
  - Diverse sources:
    - Surface runoff ("non-point sources")
    - Groundwater
    - Atmospheric
    - Wastewater Treatment Facility (WWTFs) effluents
- WWTFs represent **27%** of loading

Source: NHDES, 2010

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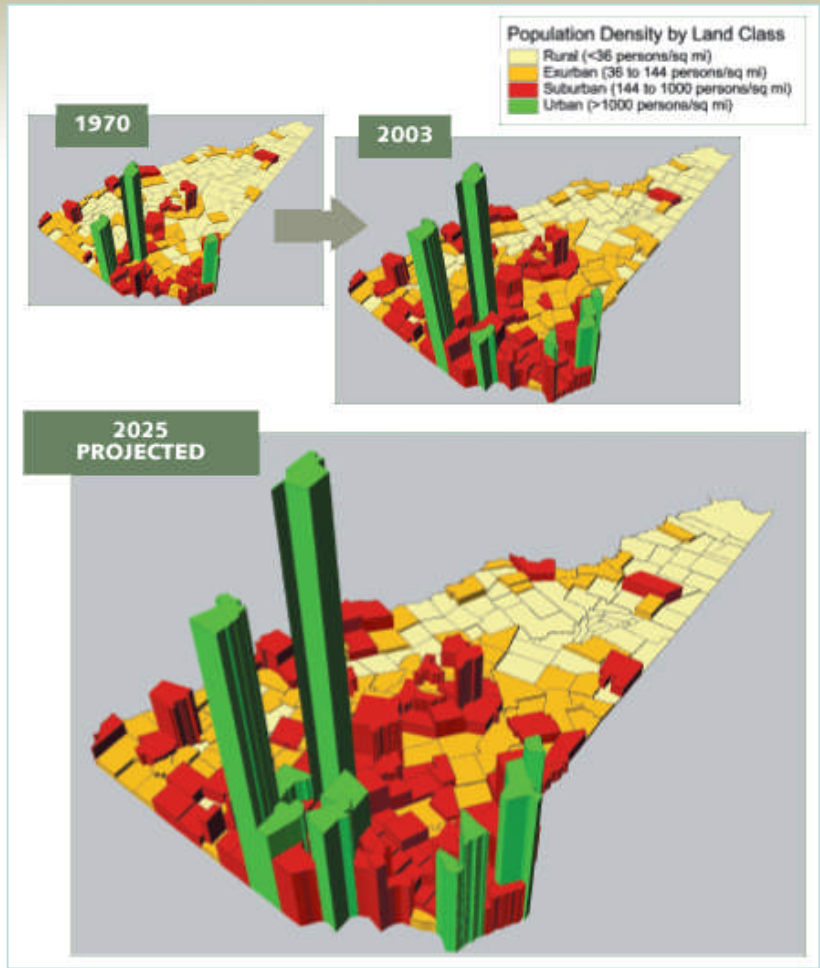
Past, Present and Future

Population Density in New Hampshire 1970 - 2025

Subsequently, this impacts watershed and landscape



Woods Hole Research Center

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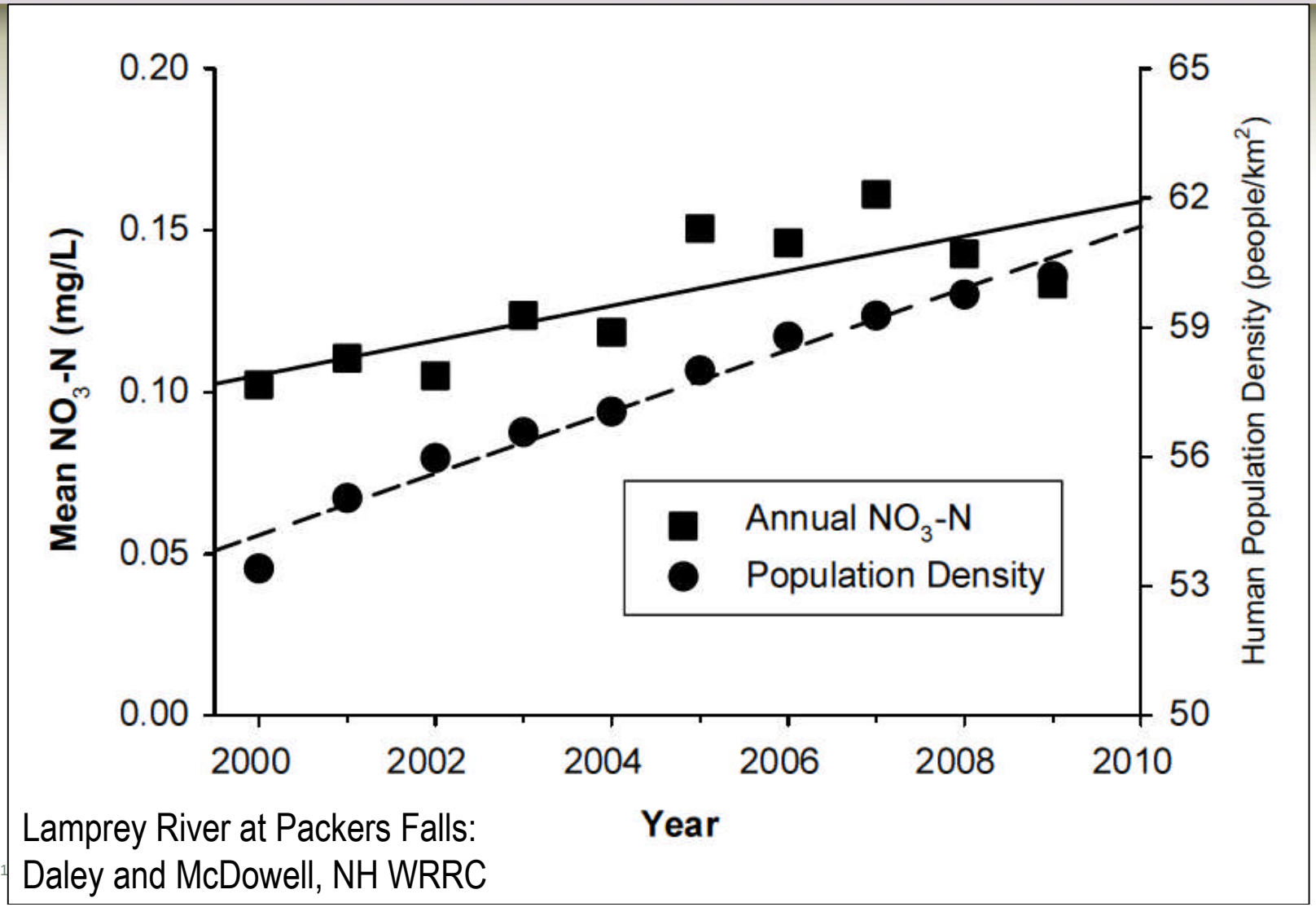
Past, Present and Future



Lamprey River at Packers Falls:
Daley and McDowell, NH WRRC

The Challenges in Front of Us

- Continued development in watershed
- Identification of contributors to impairment
- Nitrogen only a part of the issue?
- Many pollution sources are difficult to regulate or unregulated - these sources are increasing
- Challenge of multi-jurisdictional, multi-state management approach

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Traditional "Road" for Great Bay ?

- EPA and the state set stringent permit limits for single pollutant at wastewater treatment plants
  - Exeter, NH draft permit limit = 3 mg/l TN
- EPA, NHDES, MDEP establish limited controls through the municipal (MS4) storm water permit program
  - Greater than 40% of communities are not MS4s
- Limited control of the diffuse, non-point inputs

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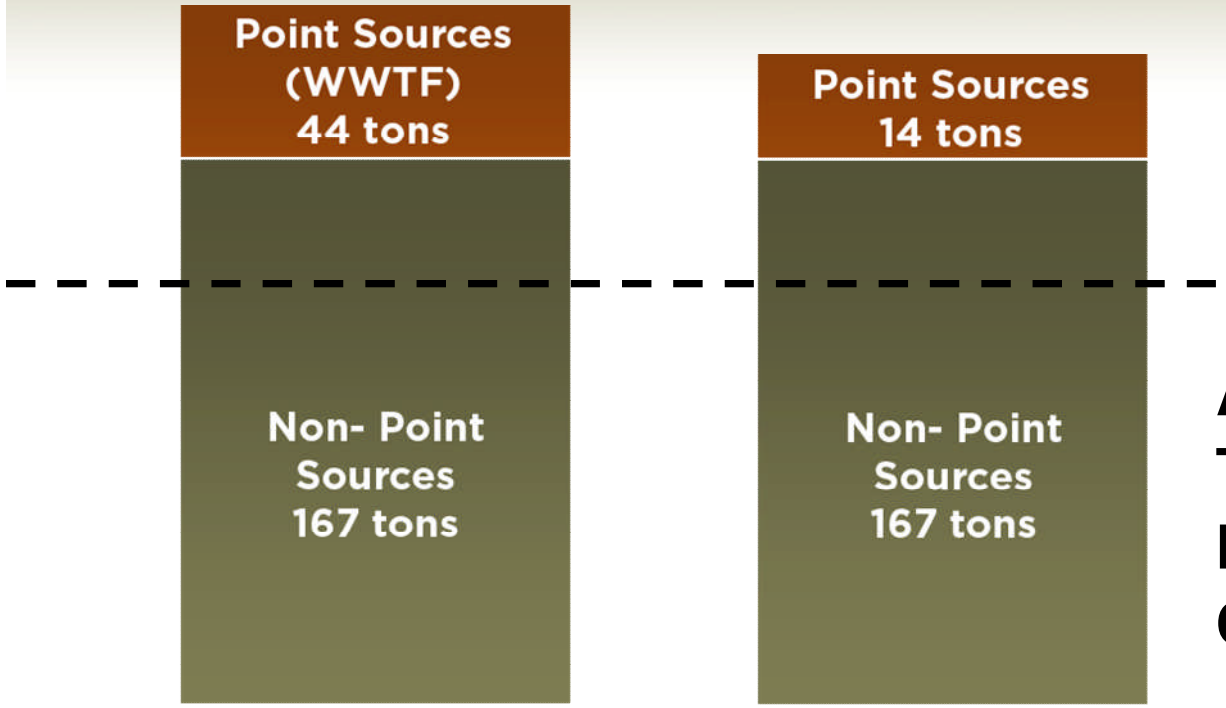
Traditional "Road" Results ?

Exeter-Squamscott River
Annual Loads
(NHDES, 2010)



140 tons

Annual Nitrogen Load Target to meet Dissolved Oxygen Criteria

Current Annual Nitrogen Load = 211 tons

After WWTF Upgrade to 3mg/l = 181 tons

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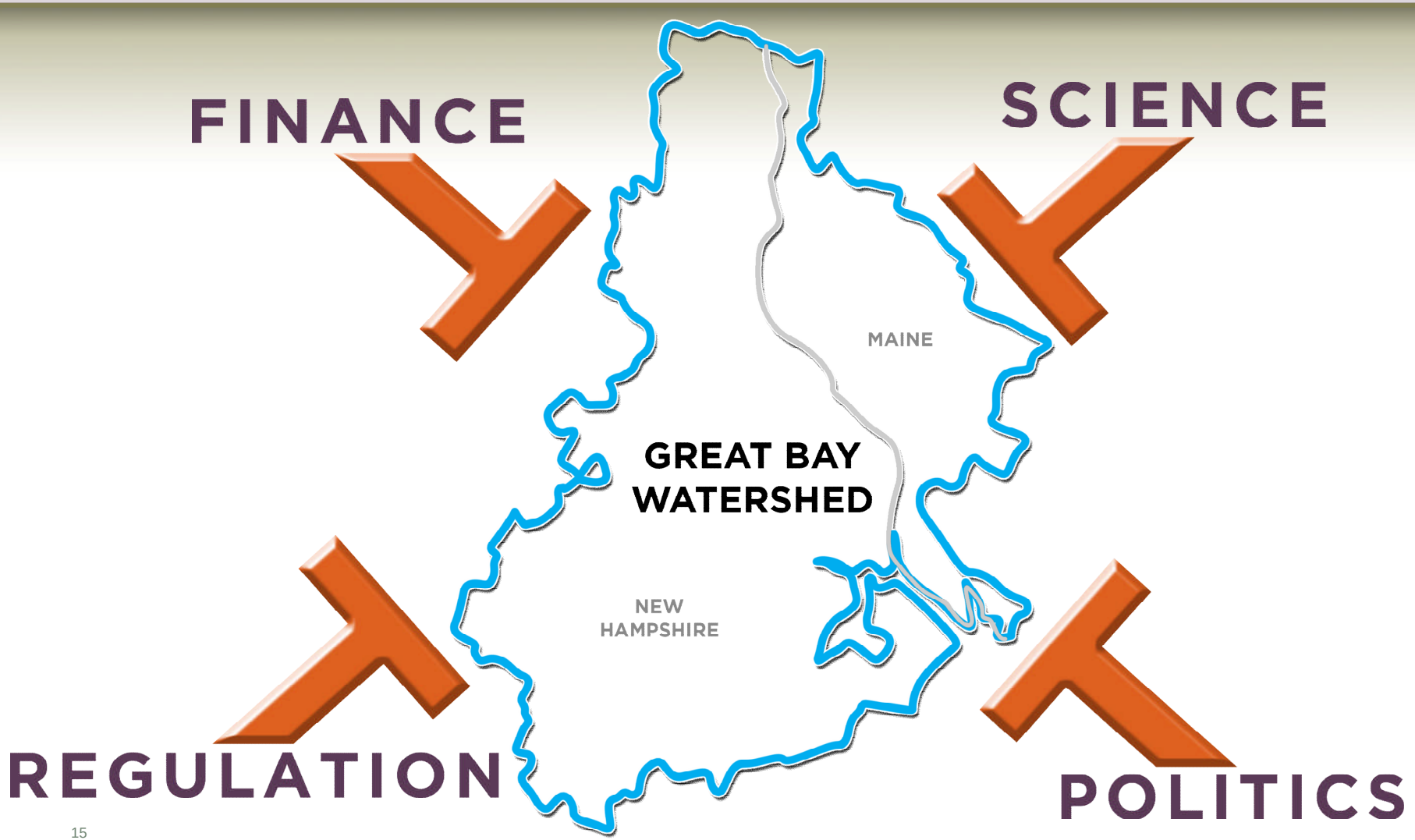
What We Know of Watersheds…
Four Influential and Competing Elements



Long Creek as a Model?

FINANCE

SCIENCE

"…breakthrough collaboration at the regional level driven by a diverse community of business, government and environmental interests coming together to find a practical, cost effective and environmentally superior solution to a persistent ecological problem in a way that transcends the command and control paradigm."

- Chris Hall, government liaison, Greater Portland Chamber of Commerce

REGULATION

POLITICS

A NEW Road?

Key stakeholders engage in dialogue on all four influential elements….

In order to develop the best, fastest environmental solution at the least cost.

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Why Should We Be Thinking This Way ?

"…radical changes to EPA's program are needed to reverse degradation of water resources and ensure progress toward the Clean Water Act's goal of "fishable and swimmable" waters….

To provide meaningful regulation, all stormwater and other wastewater discharge permits should be based on watershed boundaries instead of political boundaries."

~National Research Council Report 2008

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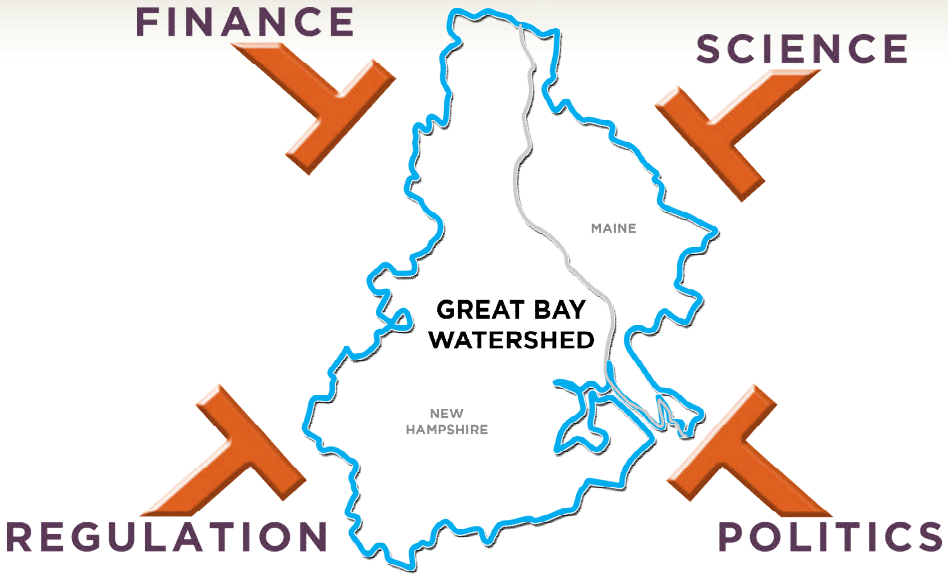
Why Might the NEW Road Work in Great Bay?

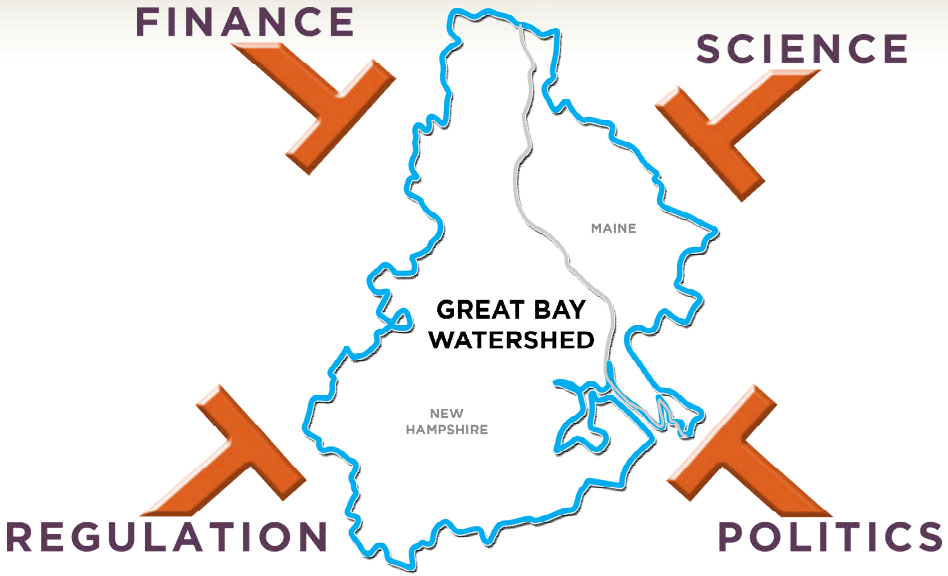
- Science
  - Dedicated NHDES
  - Excellent on-going and local research
- Regulation
  - EPA issued Exeter Permit
- Finance
  - Legal, Regional Management Framework Exists
- Politics



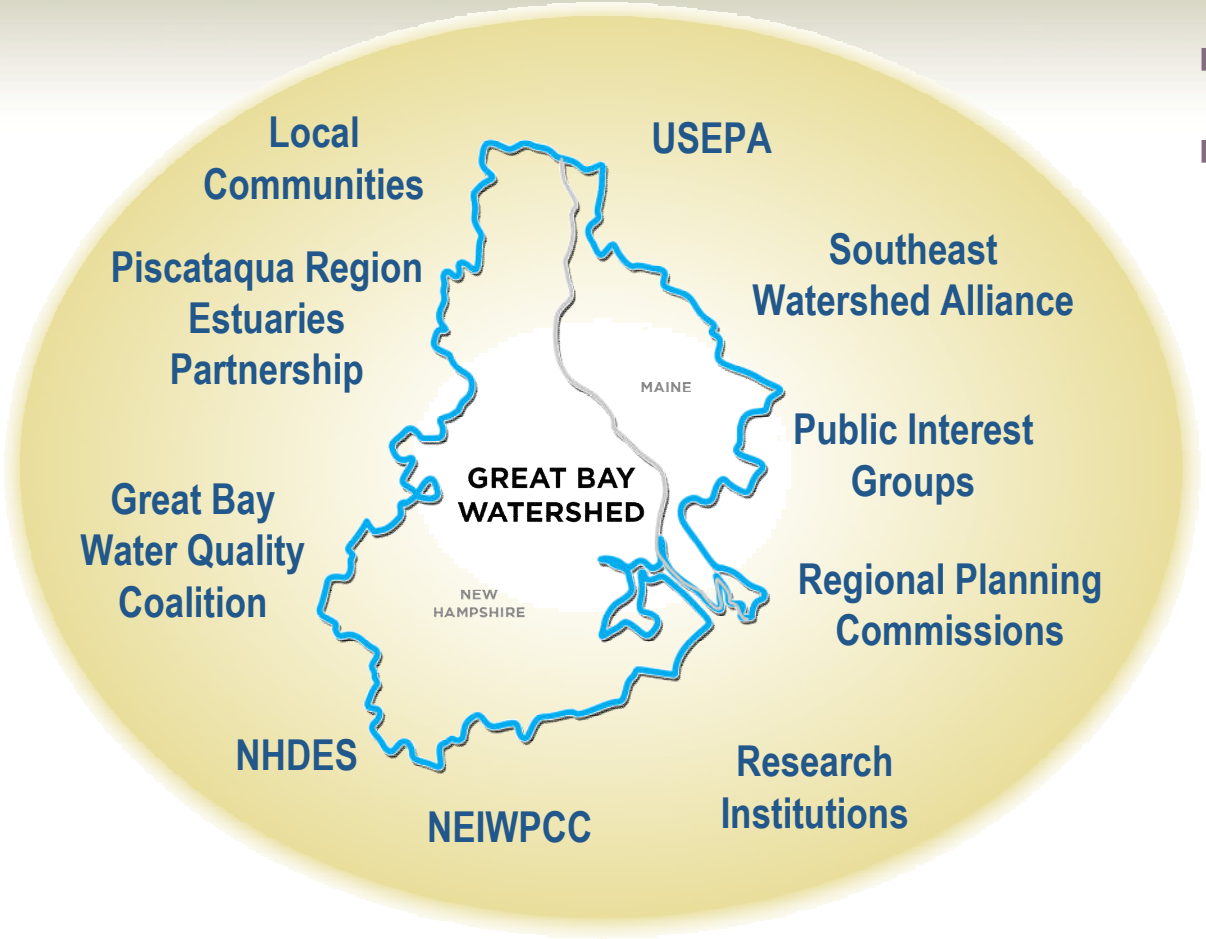
Why Might the NEW Road Work in Great Bay?

"Rep. Guinta introduces Great Bay Community Protection Act: Bill requires EPA to review Great Bay Study; Imposes 5-year ban on agency action"

- US House of Representatives
April 14, 2011



Critical Next Steps as Basis for Plan: Start from the Ground Up!



- Collaboration is key
- Evaluate administrative and institutional capacity

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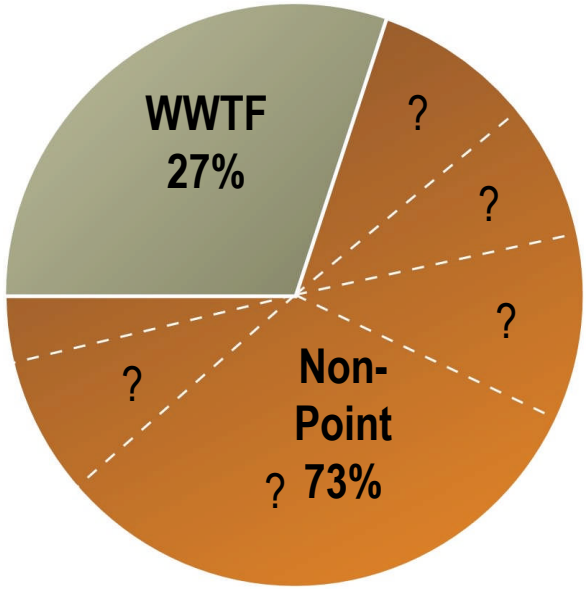
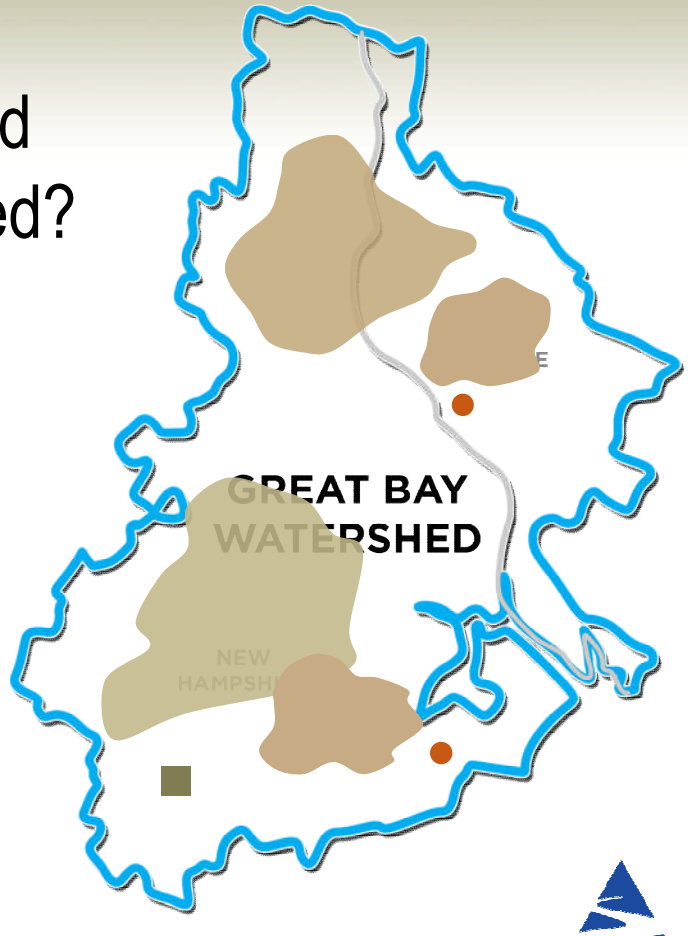
Critical Next Steps as Basis for Plan – Understand the Watershed

- What and where are the best point and nonpoint loads to address in watershed?





Critical Next Steps as Basis for Plan: Financial Planning

- Projected overall cost for WWTFs is $354,000,000 at 3 mg/l
- 4 WWTFs account for 80% of WWTF load
- “Best Bang for the Buck” ?

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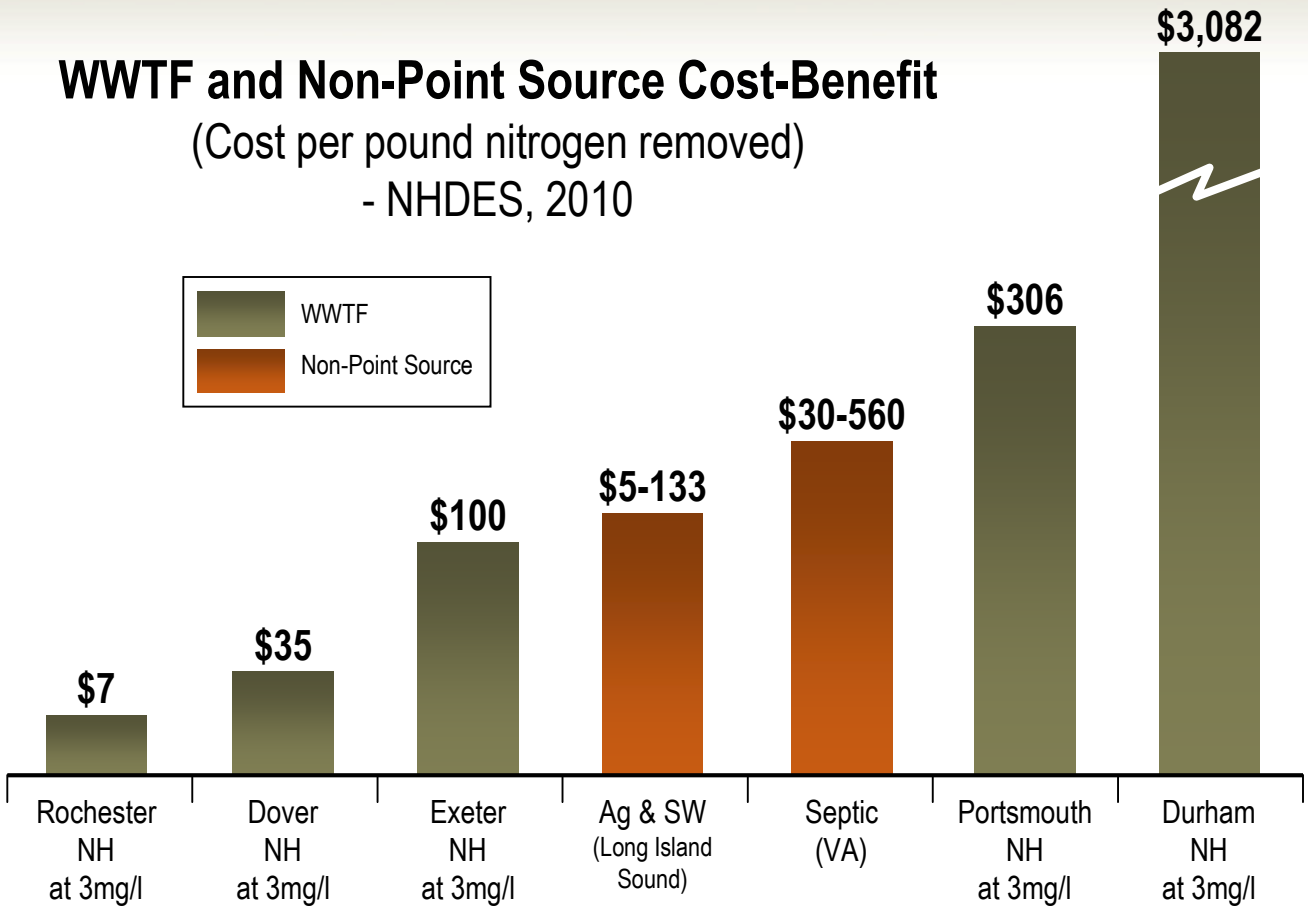
Critical Next Steps as Basis for Plan: Financial Planning



Possible Outcomes of Effective Plan

- Design upgrades at significant and cost-effective WWTFs
- Bioharvesting start-up initiatives
- Fertilizer re-formulation advocacy
- Establish realistic long-term watershed planning policies
- Implement targeted septage/septic management programs


Little Bay, N.H. 2011

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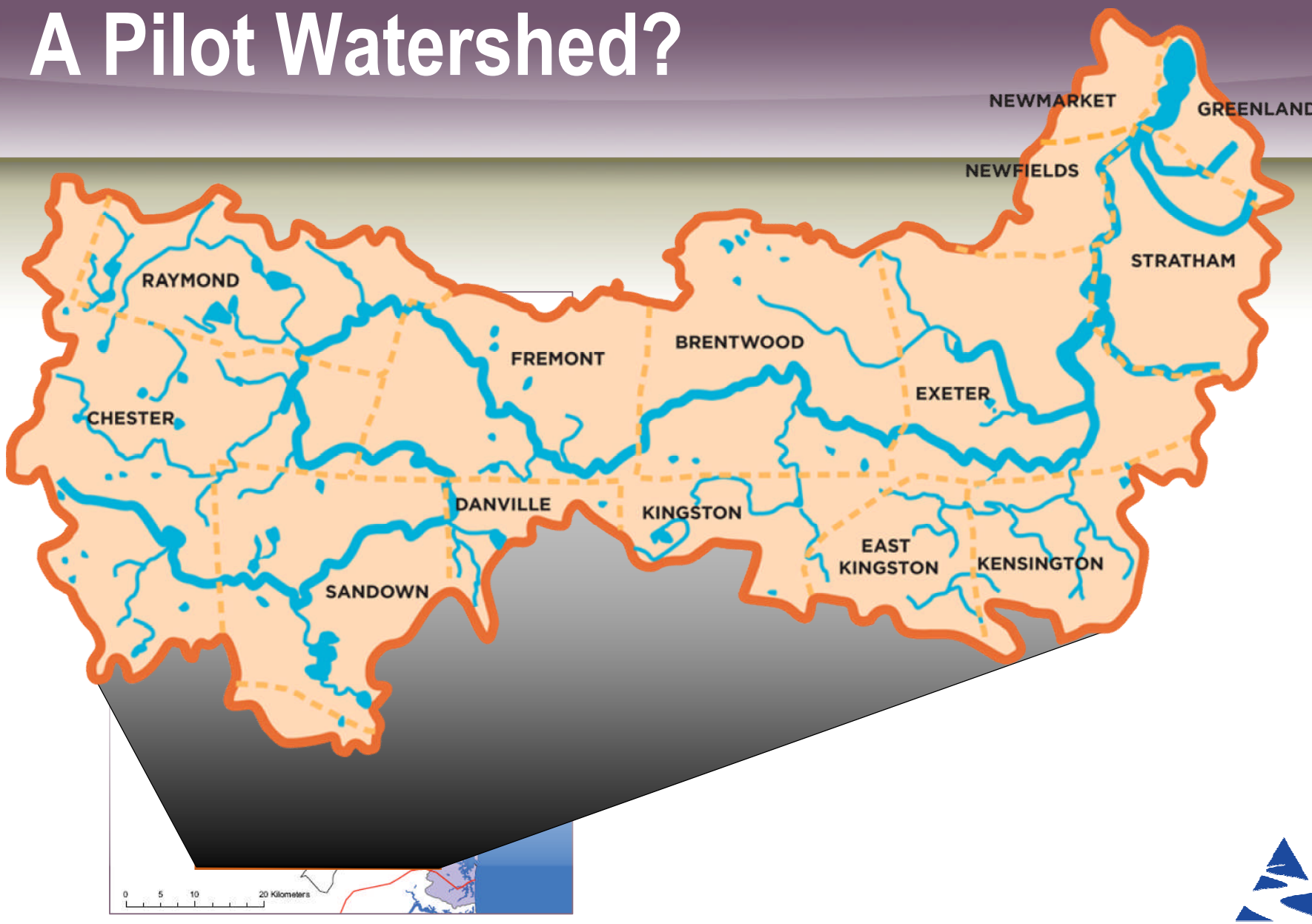
A Pilot Watershed?



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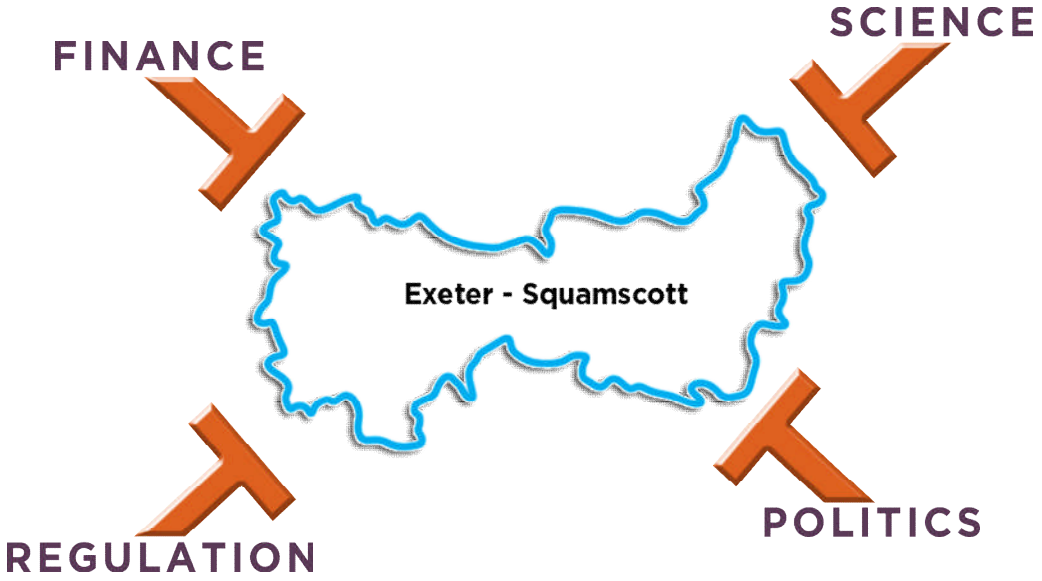
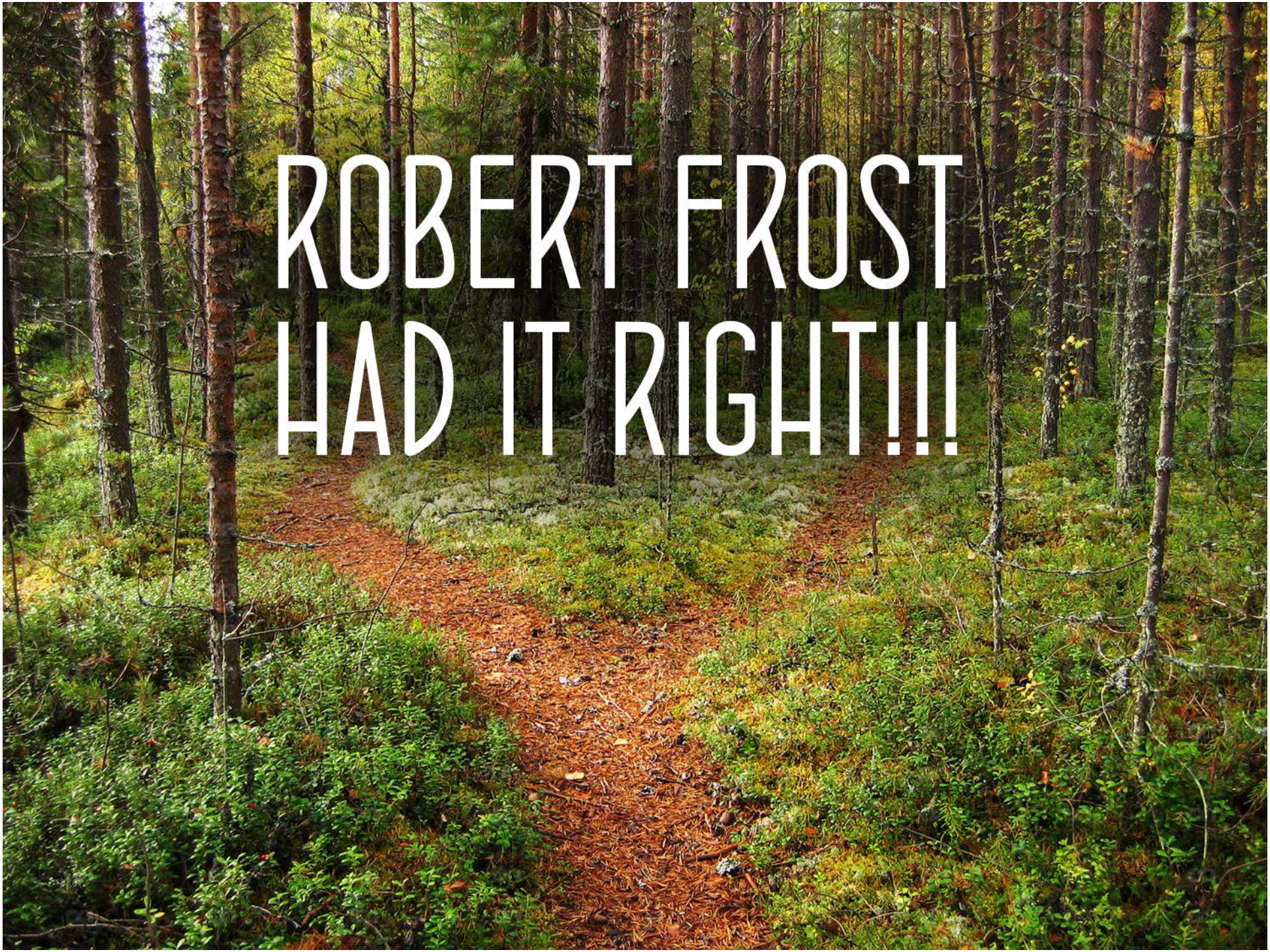
Our Closing Thoughts…

- Traditional permitting doesn't fit today's need
- Define subwatershed management and collective permitting approach (science, political, financial)




ROBERT FROST
HAD IT RIGHT!!!