CLIMATE ADAPTATION FORUM

Climate Adaptation at the Regional Scale: From Planning to Implementation

March 15, 2024

Foley Hoag LLP, Boston

and

Streaming on Zoom

EBC Environmental Business Council of New England

UMass Boston Sustainable Solutions Lab

WELCOME

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Forum Organizer

Executive Director
RPS – A Tetra Tech Company

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Conservancy


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MASS ECAN
Massachusetts Ecosystem
Climate Adaptation Network


BSA
BOSTON SOCIETY
OF ARCHITECTS/AIA


NOAH


BSLA
Boston Society of
Landscape Architects


mees
massachusetts environmental education society


Mystic River
WATERSHED ASSOCIATION


Union of
Concerned Scientists
Science for a healthy planet and safer world


CLEAN WATER ACTION | CLEAN WATER FUND

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Indrani Ghosh

Member
Climate Adaptation Forum Steering Committee

Resiliency Senior Technical Leader
Weston & Sampson

WELCOME FROM HOST

Kathleen Brill

Member, Climate Adaptation Forum Steering Committee

Partner, Foley Hoag LLP

NOMINATE – CLIMATE ADAPTATION FORUM STEERING COMMITTEE

Submit a Nomination for the Steering Committee

The Climate Adaptation Forum is seeking enthusiastic, creative, and dedicated professionals committed to volunteering their time to provide cutting-edge thought leadership through the organization and execution of quarterly forums.

All nominations are due by Sunday, March 31, 2024

PROGRAM INTRODUCTION

Melanie Gárate

Forum Co-Chair

Senior Associate, Consensus Building Institute

Climate Resilience: What do Political Boundaries Have to Do with It?

Violeta Duncan

Principal

Duncan Núñez Consulting, LLC

CLIMATE RESILIENCE: WHAT DO POLITICAL BOUNDARIES HAVE TO DO WITH IT?

DUNCAN NÚÑEZ CONSULTING

MARCH 15, 2024

CLIMATE ADAPTATION FORUM

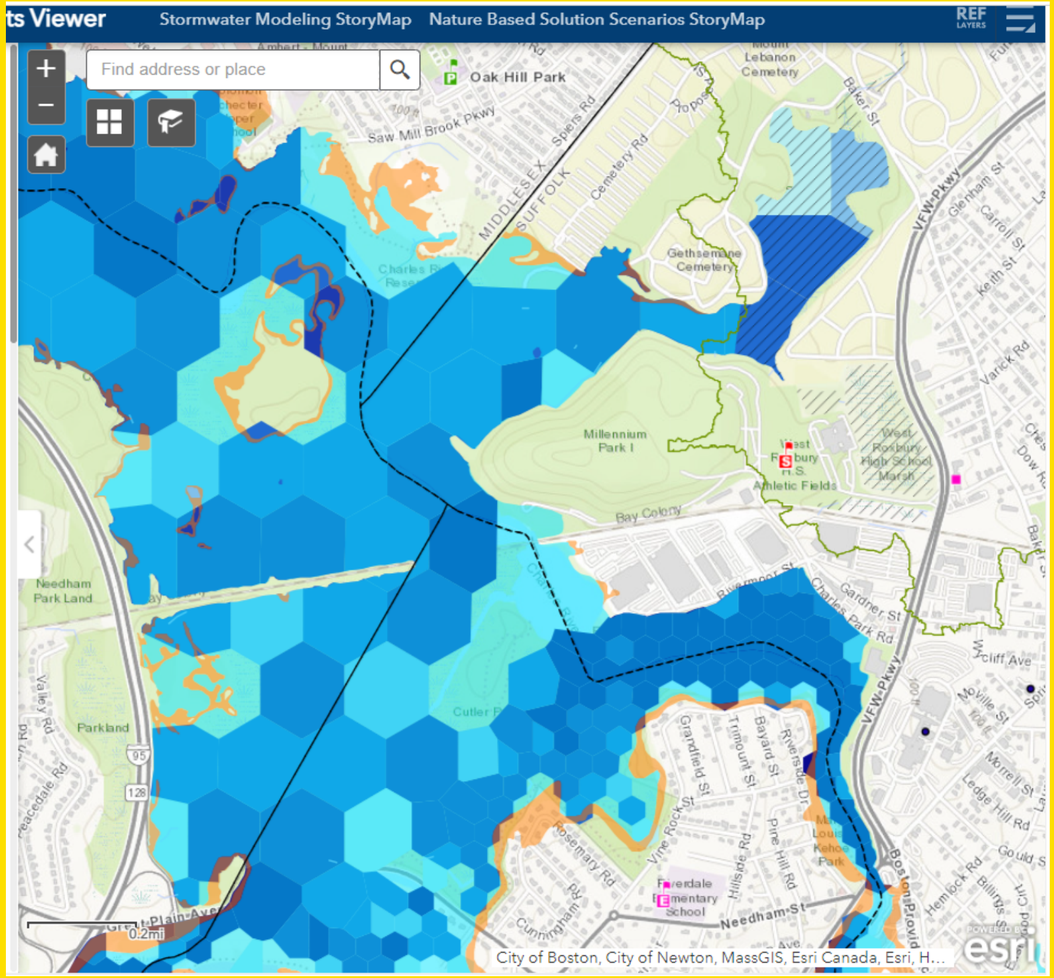


Image c/o Charles River Watershed Association

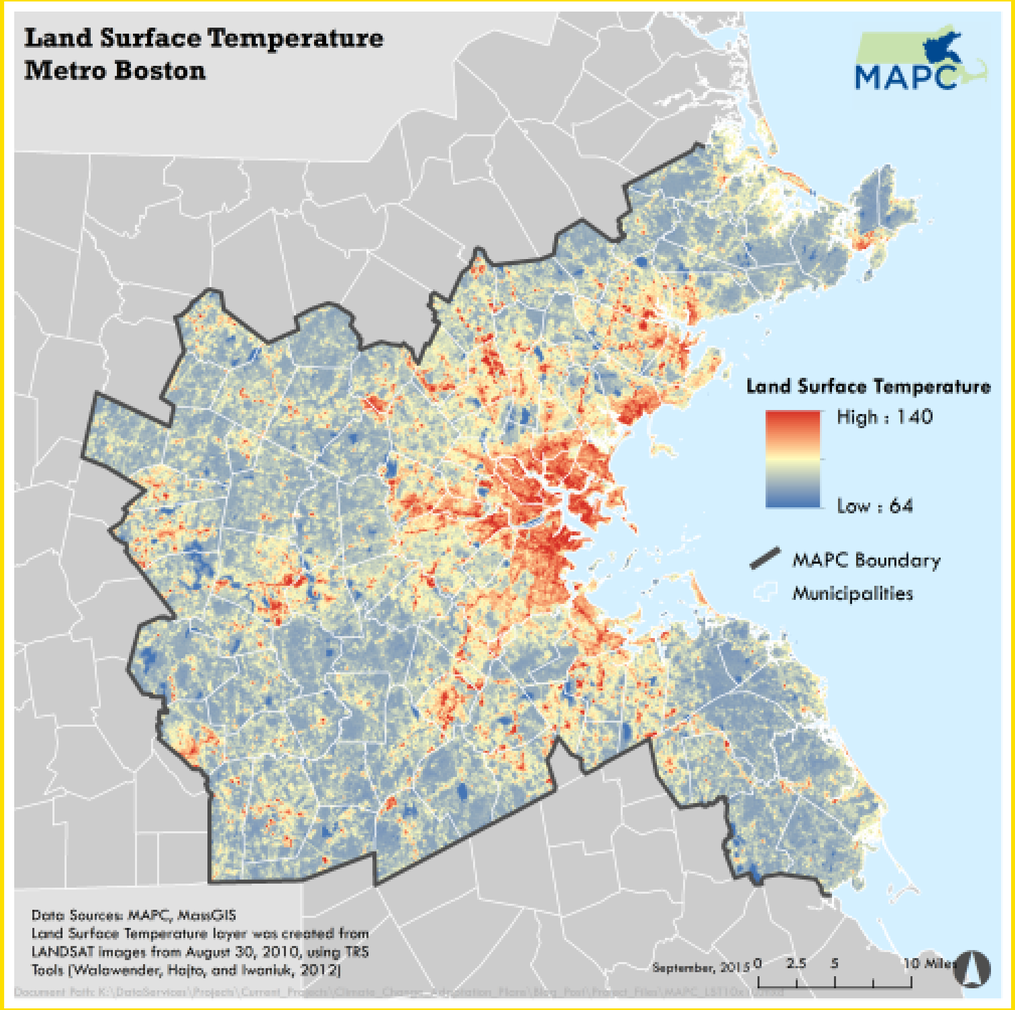


Image c/o Massachussets Area Planning Commission

COMMUNITY LEADERSHIP

PROJECT FUNDING

LAW + POLICY

INFRASTRUCTURE + ASSET MANAGEMENT

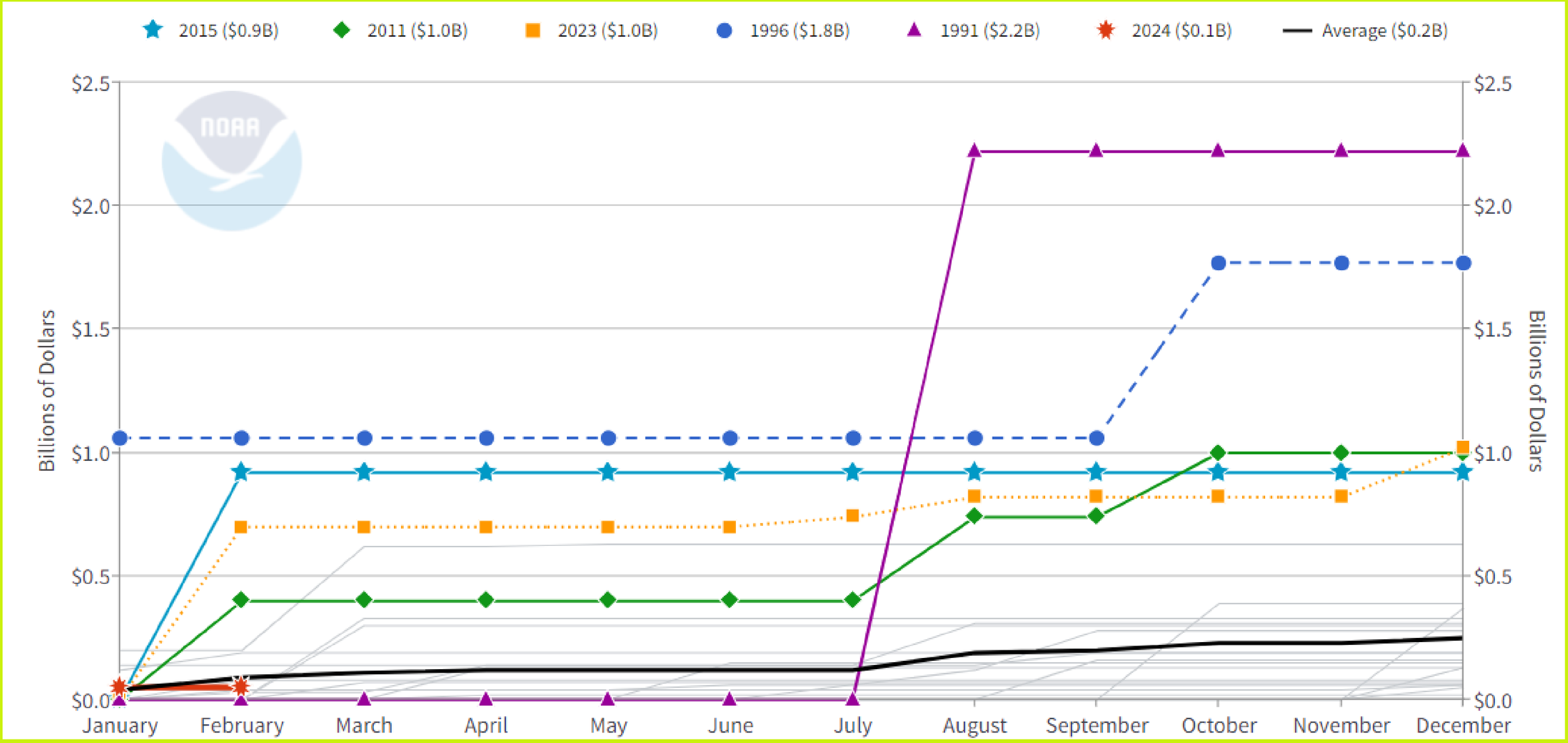
LABOR

political boundaries

1980-2024 Billion-Dollar Disaster Year-to-Date Event Count Massachussetts

NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION (NCEI) U.S. BILLION-DOLLAR WEATHER AND CLIMATE DISASTERS (2024).

DOI: 10.25921/STKW-7W73



climate adaptation at the regional scale

EQUITABLE SOLUTIONS

REDUCE COMPETITION IN FUNDUNG

SHARED SAVINGS

ACCELERATED UPTAKE OF BEST PRACTICES

SCALING UP SOLUTIONS

POLICY CHANGE

COMMUNITY OF SUPPORT

HOW CAN WE WORK ACROSS POLITICAL BOUNDARIES + BEYOND INSTITUTIONAL NORMS TO BETTER PREPARE OUR COMMUNITIES FOR CLIMATE CHANGE?

regional collaboratives for resilience

MINNESOTA WATERSHED DISTRICTS

LOUISIANA PROVISIONAL WATERSHED REGIONS

TEXAS FLOOD PLANNING REGIONS

enabling factors

AUTHORIZING REGIONAL RESILIENCE ENTITIES IN STATE LEGISLATION

CAPACITY BUILDING, TECHNICAL ASSISTANCE, AND TRAINING FOR REGIONAL RESILIENCE ENTITIES + STAKEHOLDER

OPTIMISTIC + OPPORTUNISTIC STEWARDS

FUNDING TO SUPPORT OPERATIONAL COSTS OF REGIONAL RESILIENCE ENTITIES

FUNDING AVAILABLE TO REGIONALLY-PRIORITIZED PROJECTS

EQUITABLE REPRESENTATION OF AFFECTED COMMUNITIES

MINNESOTA WATERSHED DISTRICTS

1955

FLOOD PLANNING AND MANAGEMENT

WATER AND SOIL QUALITY MANAGEMENT

WATER QUANTITY MANAGEMENT

EROSION AND SEDIMENT CONTROL

HOLISTIC WATERSHED MANAGEMENT

HYDROELECTRIC POWER GENERATION

PRESERVATION OF PUBLIC USE OF AREAS SURROUNDING RIVERS, STREAMS, + LAKES

STREAM CHANNEL IMPROVEMENT FOR NAVIGATION

KEY AUTHORITIES

ASSES TAXES

TAKE ON DEBT + BORROW FROM PUBLIC AGENCIES

PURCHASE INSURANCE TO PROTECT THE WATERSHED DISTRICT

ENTER JOINT POWERS AGREEMENTS

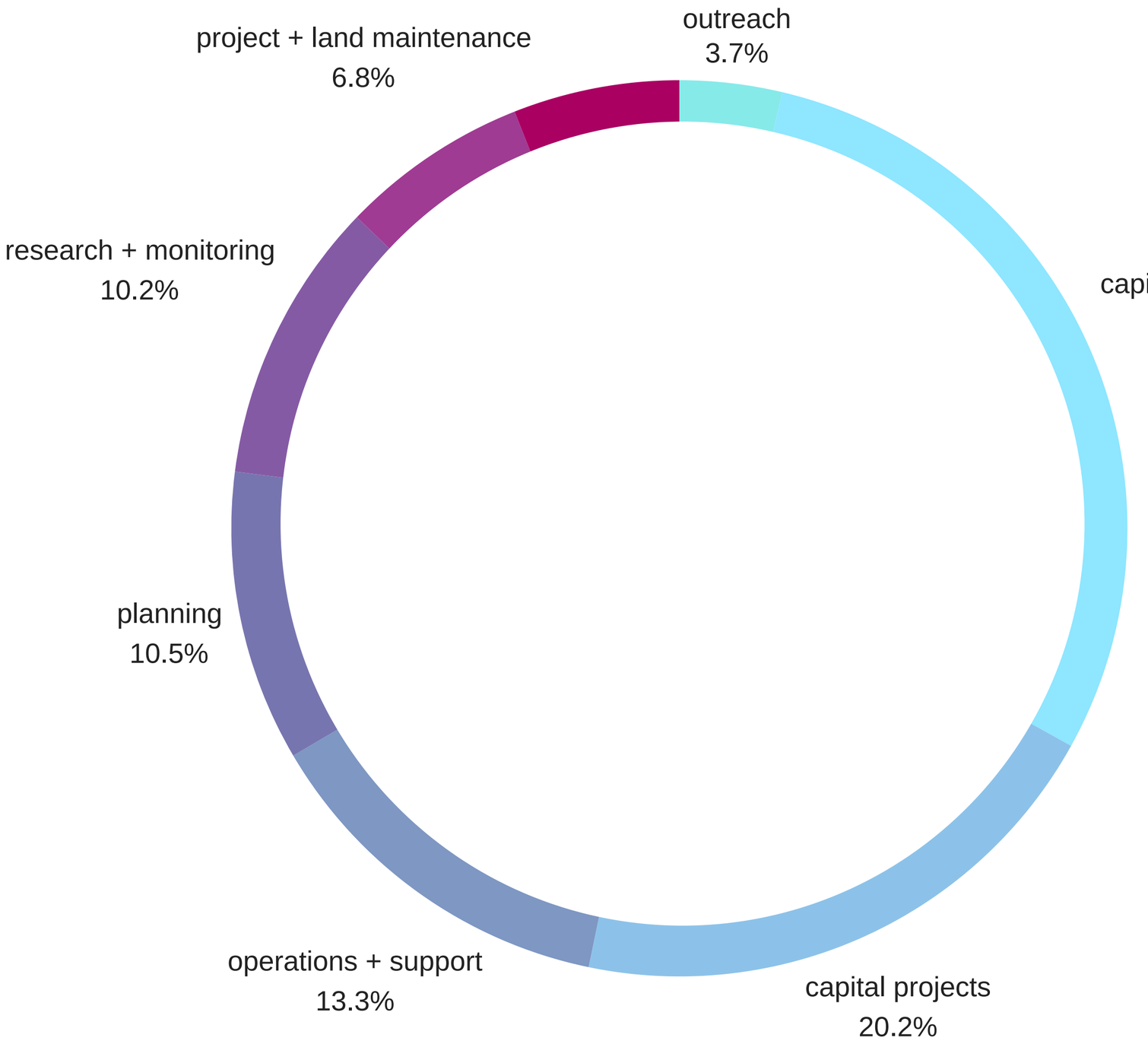
EXERCISE EMINENT DOMAIN

OWN INFRASTRUCTURE

PROCURE PROFESSIONAL SERVICES

ACCEPT STATE AND/OR FEDERAL GRANT FUNDS

SAMPLE EXPENSES



RED RIVER WATERSHED MANAGEMENT BOARD

State passed legislation to enable existing watershed districts to come together under a joint powers agreement

RRWMB given power to develop, construct, and maintain flood control projects and programs of “common benefit.”

Member watershed districts could levy up to two mills ad valorem tax (i.e., $2 tax per $1000 of assessed property value) for flood water retention projects

60
projects

$65
million

50 years

LOUISIANA WATERSHED INITIATIVE

2018

$1.2 billion CDBG-MIT grant awarded from HUD to the Louisiana Office of Community Development

REGIONAL PLANNING

FUNDRAISING FOR PROJECTS

EDUCATING ELECTED OFFICIALS

PROVIDING TECHNICAL ASSISTANCE

WATERSHED MODELING, MAPPING, AND MONITORING

EVALUATING AND RECOMMENDING PROJECTS FOR STATE FUNDING

Facilitating watershed-based floodplain management by creating watershed-bounded entities across the state.

Promoting legislative, administrative, and regulatory actions to enhance watershed and floodplain management.

Creating a path for the state, as well as its various jurisdictions and political subdivisions, to coordinate at a statewide and watershed level.

Promoting a unified effort, built on a solid foundation of scientific and engineering principles, to address flooding across the state.

COUNCIL ON WATERSHED MANAGEMENT

Office of Community Development, the Department of Transportation and Development, the Coastal Protection and Restoration Authority, the Governor's Office of Emergency Management and Homeland Security, and the Department of Wildlife and Fisheries.

$10.6 million

CAPACITY BUILDING

DEVELOP RECOMMENDATIONS FOR HOW TO ESTABLISH REGIONAL ENTITIES AND ESTABLISH LONG-TERM CAPACITY TO CONTINUE COORDINATION BEYOND THE LIFE OF THE LWI

PRIORITIZE KEY ISSUES AND CHALLENGES THAT CANNOT BE ADDRESSED AT A LOCAL OR STATE LEVEL OR THAT FACE UNIQUE HURDLES THAT REQUIRE REGIONAL SUPPORT

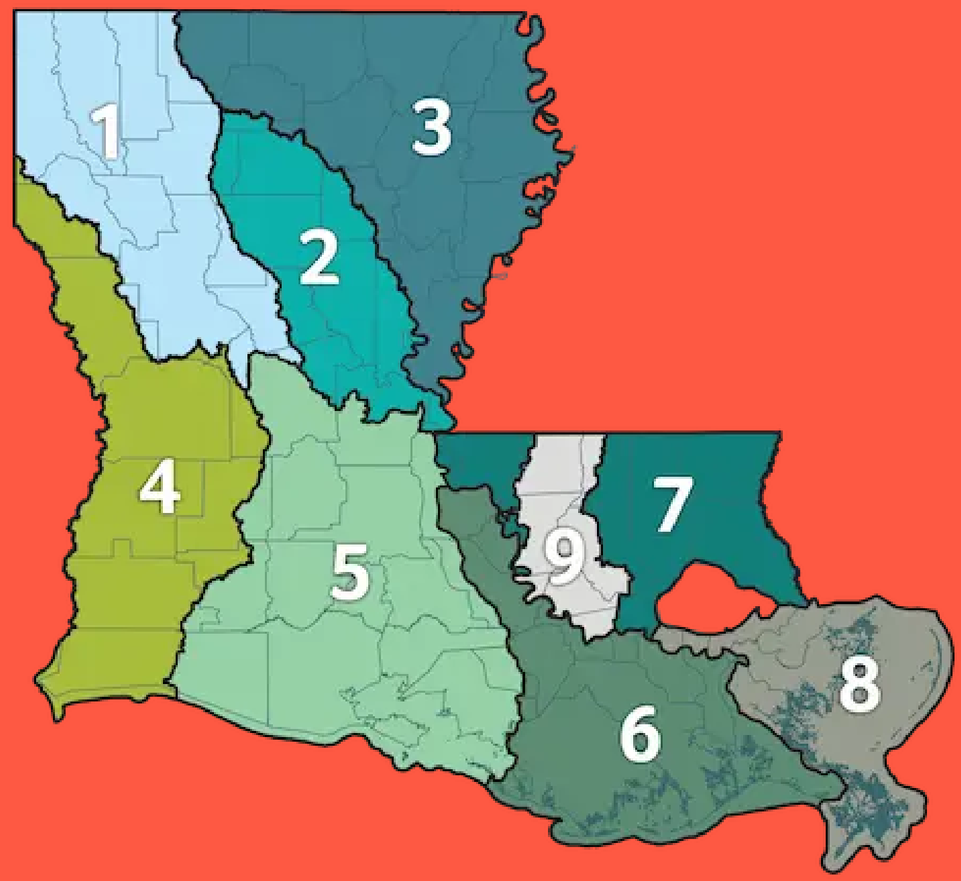
EXPLORE AND REVIEW APPROACHES USED AND ANALYSES COMPLETED THAT WEIGH THE PROS AND CONS OF REGIONAL APPROACHES TO WATERSHED MANAGEMENT

REVIEW THE EXISTING ENTITIES THAT MANAGE WATER RESOURCES, AS WELL AS POTENTIAL IMPLICATIONS FOR ANY NEW MODELS OF REGIONAL GOVERNANCE

SUPPORT HIGHER DEVELOPMENT STANDARDS ON A REGIONAL SCALE FOR FLOOD RISK REDUCTION

louisiana provisional watershed regions

15-20-person regional steering committee, including representatives from each parish in the watershed



RESTORATION, ENHANCEMENT OR PRESERVATION OF FLOODPLAINS AND WETLANDS

FLOOD MITIGATION OF CRITICAL INFRASTRUCTURE AND STORMWATER MANAGEMENT PROJECTS

BUYOUT OR ELEVATION PROJECTS FOR FLOOD-PRONE RESIDENTIAL AREAS

MAJOR CAPITAL PROJECTS THAT IMPROVE FLOOD RESILIENCE OR PROVIDE REGIONAL STORMWATER DETENTION

VOLUNTARY RELOCATION PROJECTS TO MOVE RESIDENTS OUT OF HIGH FLOOD RISK AREAS

ACQUISITION OF FLOODPLAIN EASEMENTS IN FLOOD ABATEMENT AREAS OR DEVELOPMENTS IN REPETITIVE LOSS AREAS

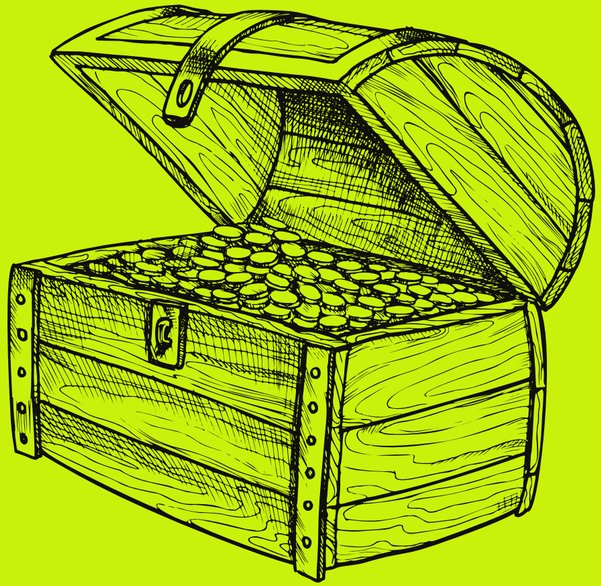
IMPLEMENTATION OF RESILIENT DEVELOPMENT STANDARDS AND FLOODPLAIN MANAGEMENT REGULATIONS

HOUSING DEVELOPMENTS USING RESILIENT CONSTRUCTION PRACTICES

$570 million

LOCAL AND REGIONAL PROJECTS

louisiana provisional watershed regions



TEXAS REGIONAL FLOOD PLANING GROUPS

2020

SUPPORT STATEWIDE FLOOD PLANNING

texas water development board + the texas flood assessment

Improve and update flood mapping and modeling

Coordinate watershed-based planning

Carry out mitigation efforts, such as policy enhancements, increased technical assistance, and financial assistance for project implementation

$793 million

FLOOD INFRASTRUCTURE FUND

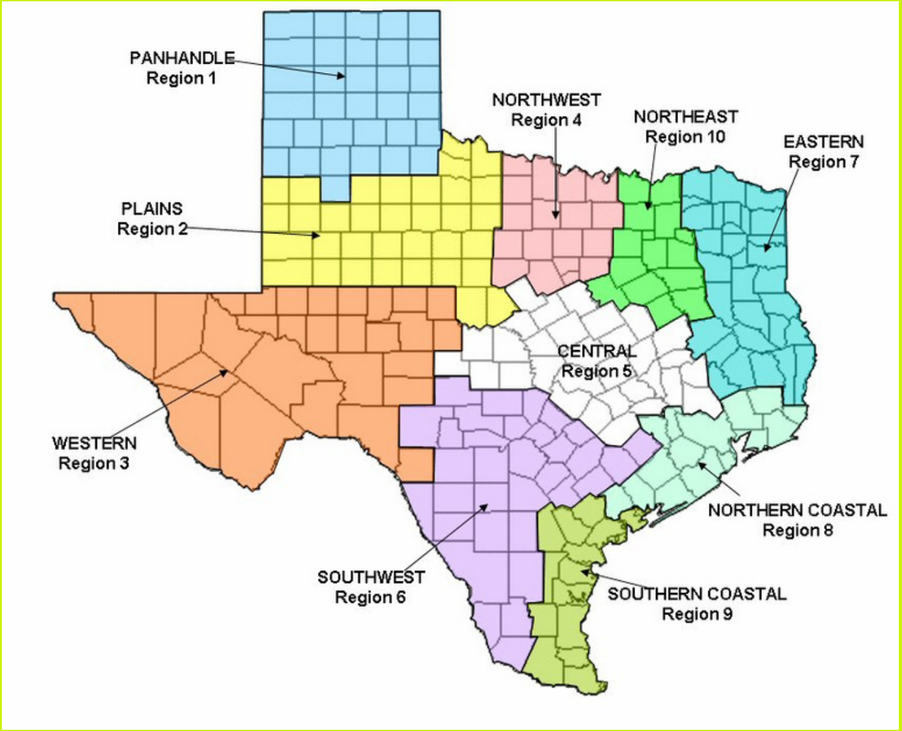
$23.7 million

FLOOD SCIENCE AND MAPPING

$30+ million

REGIONAL FLOOD PLANNING

regional flood planning groups



AGRICULTURE
COUNTIES
ELECTRIC GENERATING UTILITIES
ENVIRONMENT
FLOOD DISTRICTS
INDUSTRY
MUNICIPALITIES
SMALL BUSINESS
PUBLIC RIVER AUTHORITIES
WATER DISTRICTS
WATER UTILITIES
NONVOTING MEMBERS

REGIONAL ENGAGEMENT

Regional flood planning groups “allow entire regions with a shared hydraulic connection to plan together and address their flood risk in a way that focuses on their unique needs.”

TWDB Director of Flood Planning
Reem Zoun

flood management project considerations

METRICS ON FLOOD SEVERITY, FLOOD RISK/DAMAGE REDUCTION

ESTIMATED CAPITAL AND OPERATIONS AND MAINTENANCE COSTS

BENEFIT-COST RATIOS

ENVIRONMENTAL BENEFITS/IMPACTS

POTENTIAL FOR NATURAL FLOOD MITIGATION

IMPLEMENTATION CONSTRAINTS

WATER SUPPLY BENEFITS

NEGATIVE IMPACT ON SURROUNDING AREAS

normalizing the work

ALLOW RFPGS TO DEVELOP FUNDING STUDIES AND PROJECTS

ALLOW RFPGS TO GUIDE THE DEVELOPMENT OF COOPERATIVE AGREEMENTS IN THE BASIN AND APPLY FOR FEDERAL FUNDING

ESTABLISH A PERPETUAL SOURCE OF FUNDING FOR PROJECT RECOMMENDATIONS

INCREASE GRANT FUNDING AND ESTABLISH FAVORABLE LOAN TERMS FOR ANY LOAN SHARE IN TWDB'S FUNDING PROGRAM

BUILDING RESILIENCE FROM THE WATERSHED UP:

WATERSHED-BASED COLLABORATION AND COORDINATION FOR FLOOD PLANNING AND FLOOD MANAGEMENT

AMERICAN FLOOD COALITION

https://stateresilience.org/leadership-and-accountability/

Oregon's Approach to Watershed Restoration

Stephanie Page

Acting Director

Oregon Watershed Enhancement Board

OREGON'S APPROACH TO WATERSHED RESTORATION

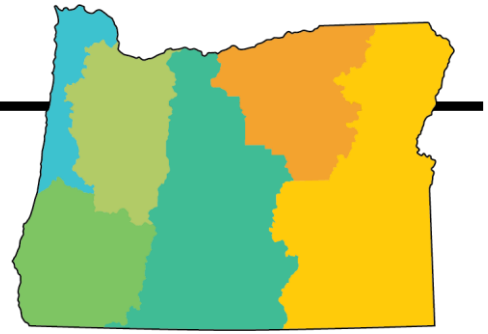
Stephanie Page
Acting Executive Director

OREGON WATERSHED ENHANCEMENT BOARD

SUMMARY

- Relies on partnerships
- Role of the State of Oregon
- Trends in Restoration

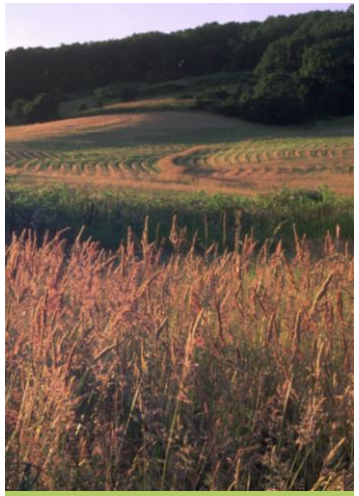
THE OREGON LANDSCAPE



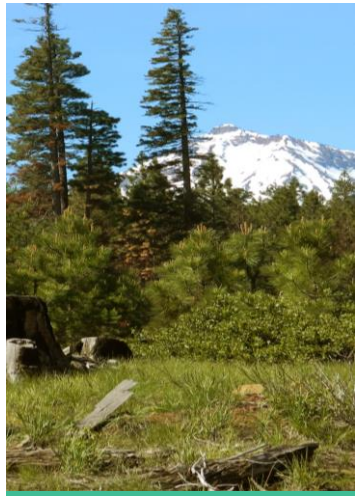
- Large Western state
- Diverse landscapes
- Significant public and private lands
- Urban and rural
- Diverse natural resource issues

North Coast

South Coast



Willamette Valley



Central

Eastern

Mid-Columbia

RESTORATION PARTNERS

- Watershed councils
- Local governments – SWCDs, irrigation districts, cities, counties
- Tribes
- Private landowners
- State/federal government
- Public landowners
- Non-profit organizations

WHAT IS A WATERSHED COUNCIL?

- Enabled by Legislature
- Voluntary, non-regulatory
- Community-based
- Lead watershed assessment, action planning, implementation
- Many have developed significant capacity

OREGON PLAN FOR SALMON AND WATERSHEDS

- Established in the 1990s
  - Environment, communities, economies
  - Integrated plan
- Grant funding

OREGON WATERSHED ENHANCEMENT BOARD




OWEB GRANT FUNDING SUPPORTS

- On-the-ground restoration
- Technical assistance
- Community engagement in specific projects
- Land and water acquisitions
- Capacity grants to SWCDs and WSCs
- Assessment and monitoring

RELYING ON GRASSROOTS PARTNERS

- They have community connections and credibility
- Knowledge of local conditions
- Capacity challenges for some groups
- Capacity funding award distribution

HOW ARE WE DOING?

- Strong public support for watershed work
- Landscape-scale grant program
  (Focused Investment Partnerships)
- Process-based restoration
- Impacts of climate change to watershed health
- Environmental outcomes of our work

OREGON WATERSHED ENHANCEMENT BOARD

WHAT'S NEXT?

- DEI & EJ
- Climate
- Urban and rural needs
- New sources of funding

THANK YOU!

Stephanie Page stephanie.page@oweb.oregon.gov

OREGON WATERSHED ENHANCEMENT BOARD

Berkshires Clean Cold Connected Partnership

Erik Reardon

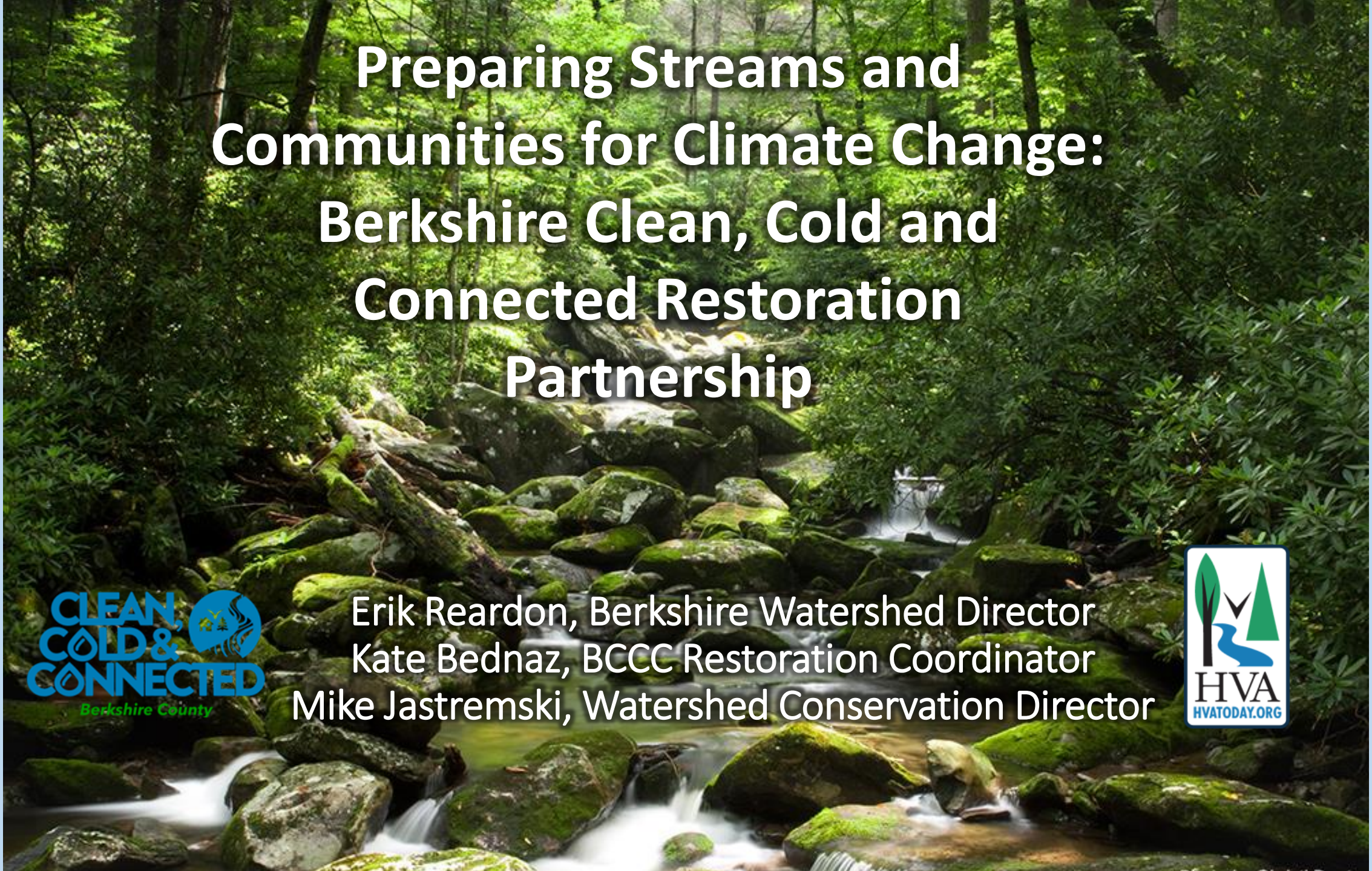
Berkshire Watershed Director
Housatonic Valley Association

Kate Bednaz

Restoration Coordinator
Berkshires Clean Cold Connected Partnership

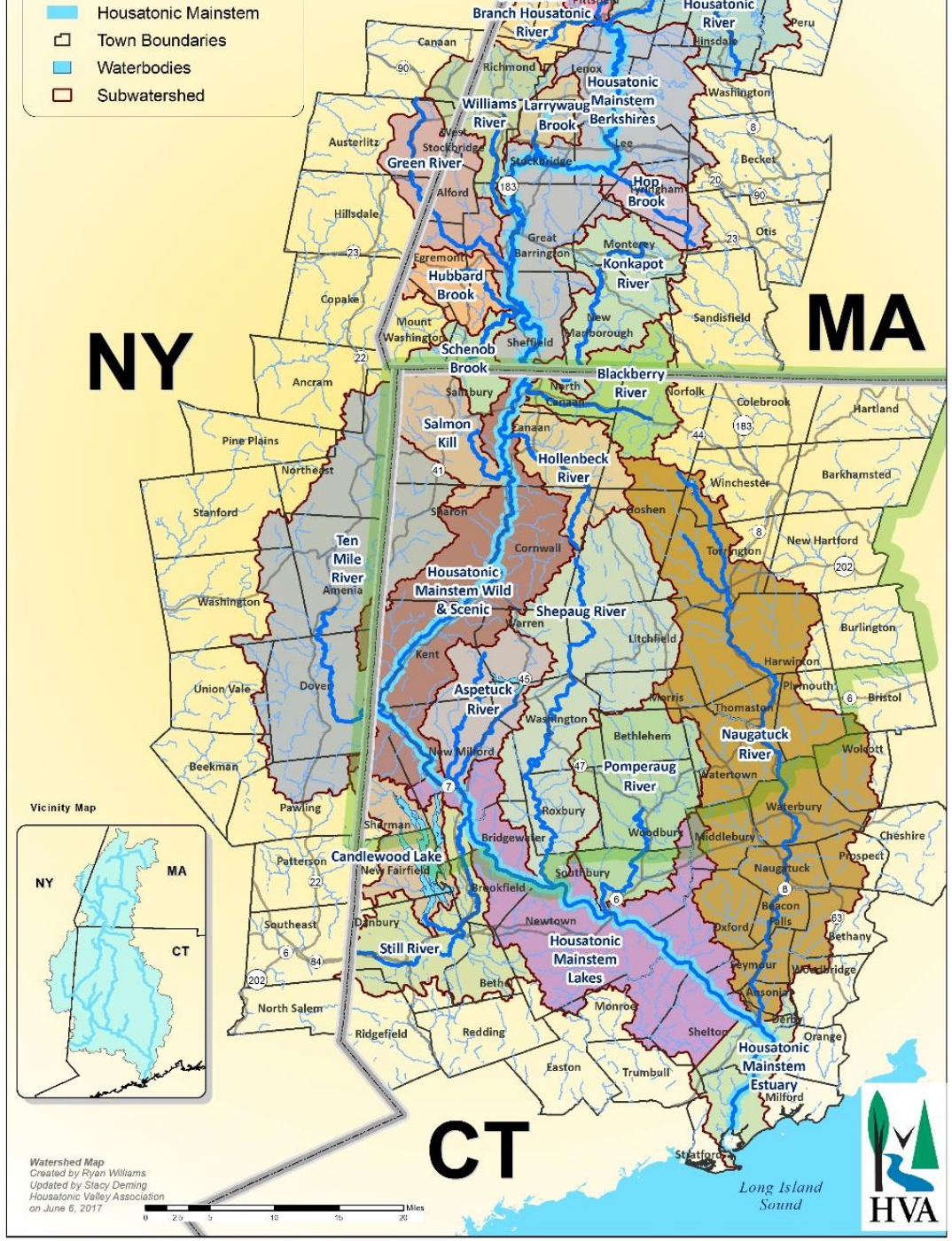
Michael Jastremski

Watershed Conservation Director
Housatonic Valley Association



Preparing Streams and Communities for Climate Change: Berkshire Clean, Cold and Connected Restoration Partnership

Erik Reardon, Berkshire Watershed Director
Kate Bednaz, BCCC Restoration Coordinator
Mike Jastremski, Watershed Conservation Director

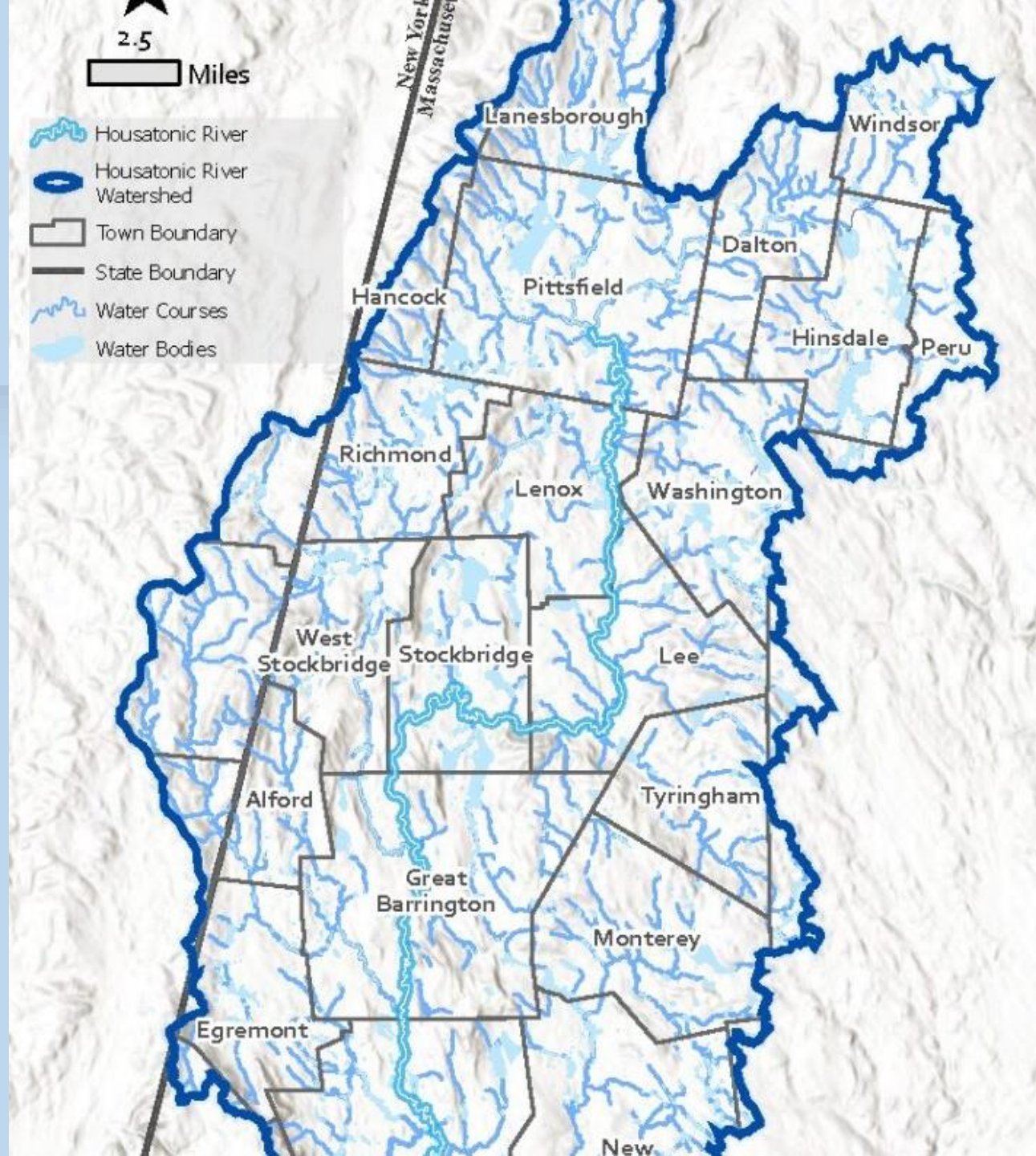


Housatonic Valley Association - Geographic Extent

- 149 main-stem miles from Berkshires to Long Island Sound
- Roughly 4,200 tributary miles in MA, NY, CT
- 100 municipalities
- Wildlands to ultra-urban

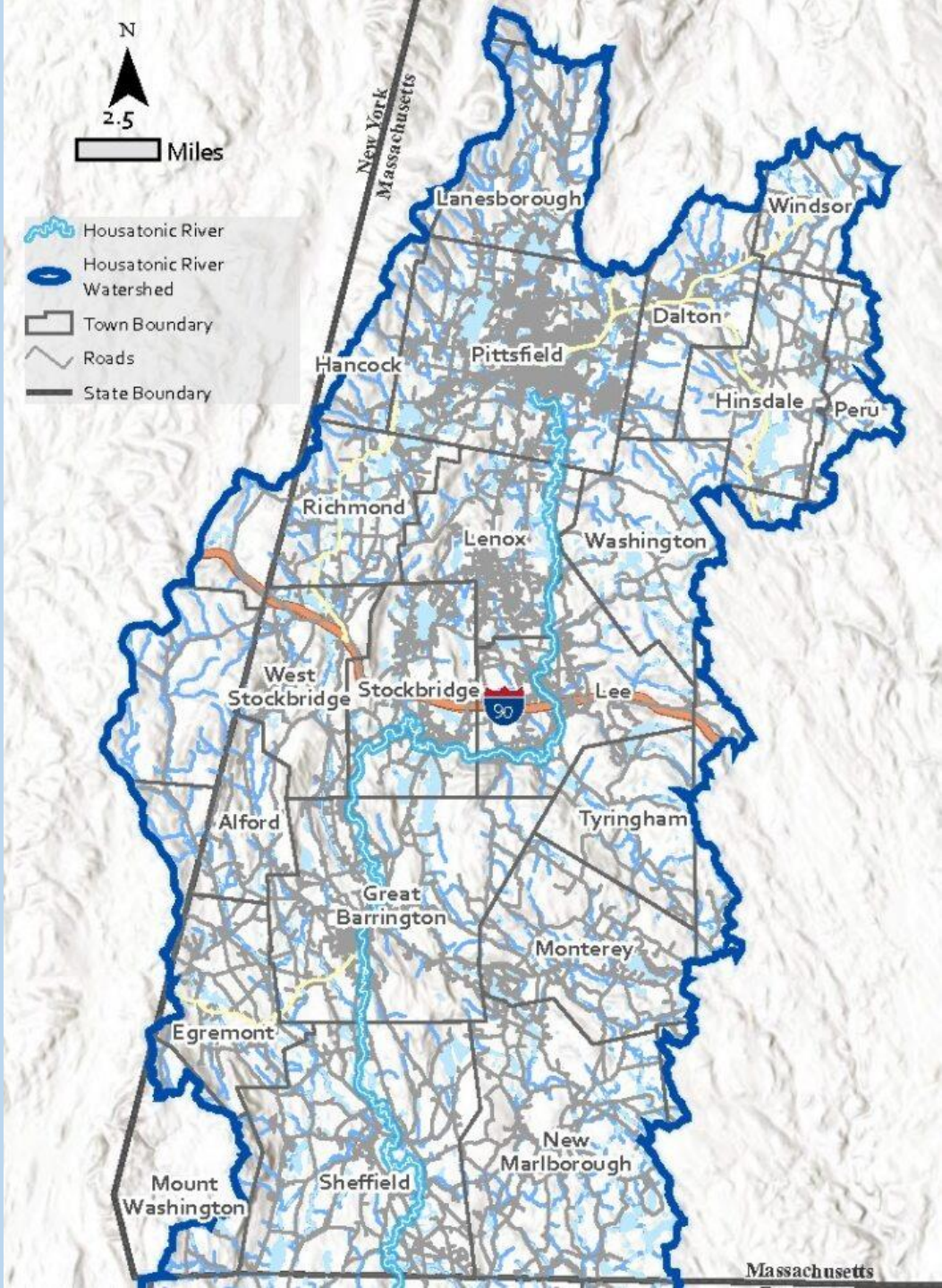
Housatonic River - Berkshire Watershed

- 605 Miles of Perennial and Intermittent Streams



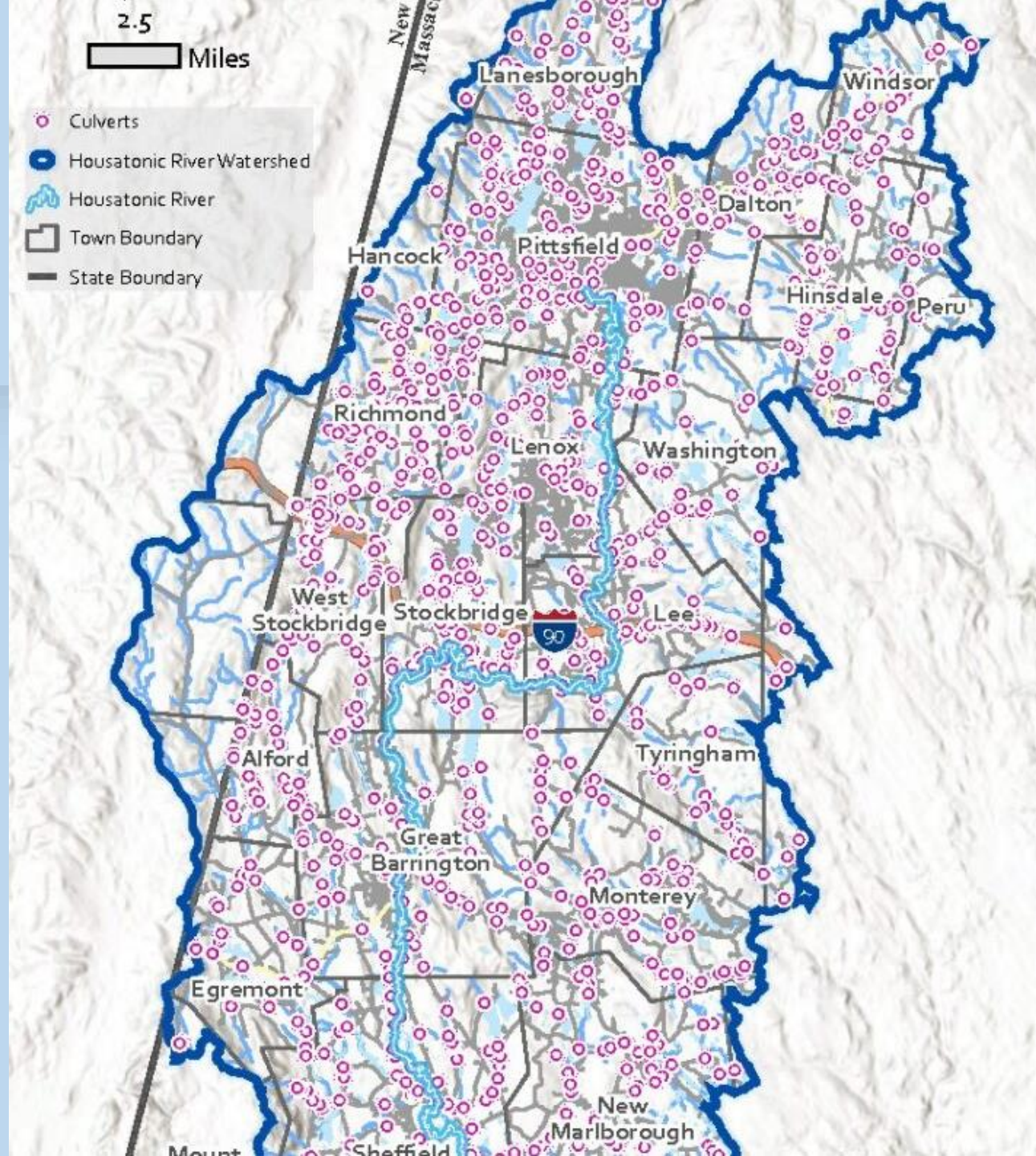
Housatonic River - Berkshire Watershed

- 1,629 Miles of Roads



Housatonic River - Berkshire Road-Stream Crossings

- 1,376 Bridges, Culverts and other Road-Stream Crossings



Berkshire Clean Cold Connected

...

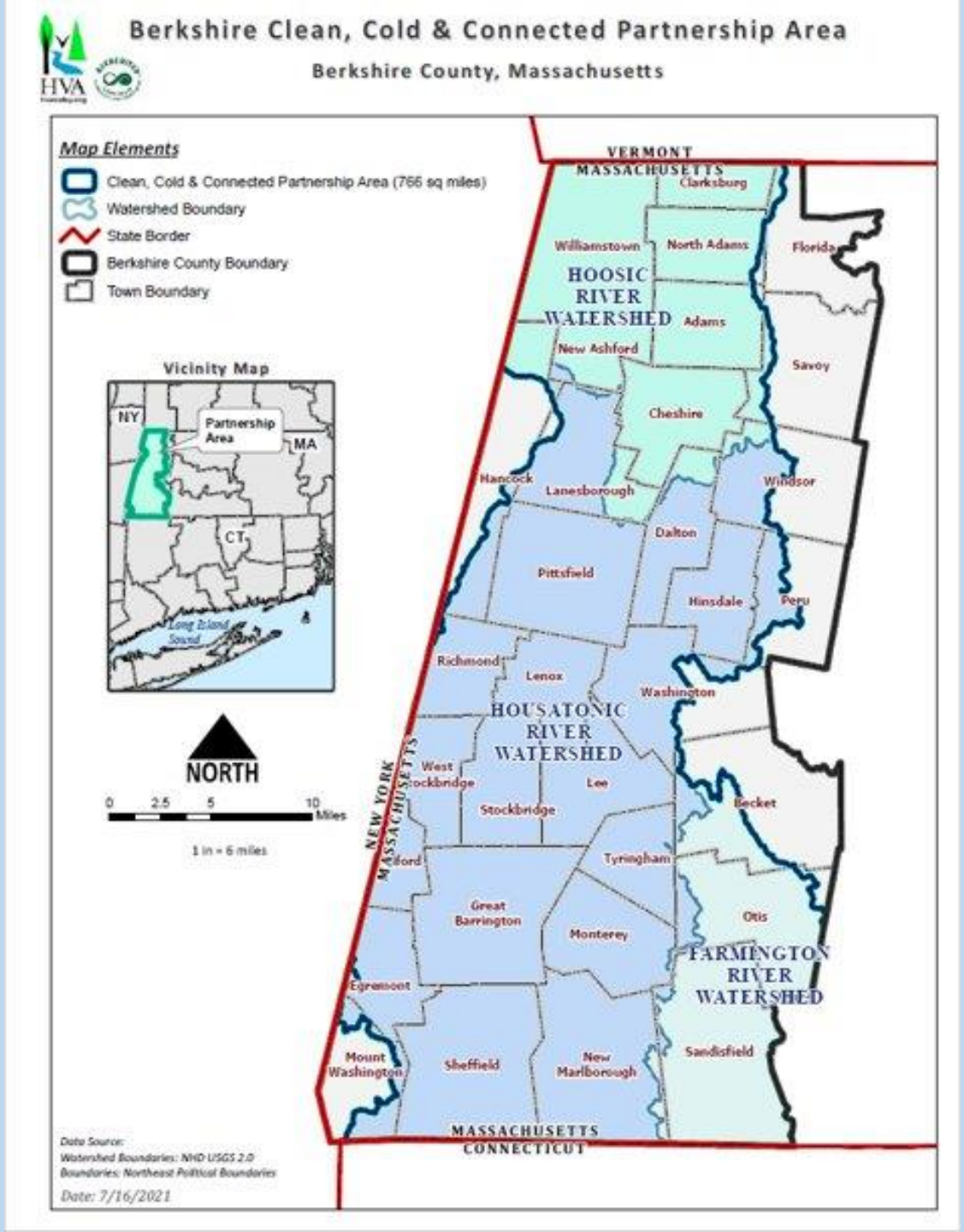
Funded by Mass DER Partnerships Program

CLEAN, COLD & CONNECTED
Berkshire County

BCCC Partnership Quick Facts

- Established April 2022
- 3-Year grant award with indications for a 5–10-year program span
- Lead Organization & 6 Core Partner Organizations
- Average Grant Budget
  - $200,000 Capitol Funds – Annual FY Award
  - $200,000 ARPA Funds – Implementation FY23-25
  - Variable Operational Capitol Surplus as Available
- Budget towards Planning and Implementation Projects/Initiatives

Clean, Cold & Connected
Berkshire County



BCCC Partnership Area

Partnership Area Regions – Hoosic, Housatonic and Farmington River Watersheds within Berkshire County

Partnership Area – 766 square miles

CLEAN, COLD & CONNECTED
Berkshire County

BCCC Partnership Vision

We envision a region that is ecologically resilient to climate change and a community that is interconnected with the health and well-being of our watersheds. We anticipate increasing the pace and scale of ecological restoration in The Berkshires by building the capacity of local municipalities and partner organizations to collaboratively restore degraded aquatic ecosystems and increase climate resiliency.

As a result of our ongoing efforts, the BCCC Partnership would ideally see:

1. restored habitat for wildlife and native species thriving;
2. eastern brook trout thriving in the Berkshires due to streams and rivers being clean, cold, and connected;
3. interconnection of the health and well-being of people and watershed;
4. clean water, safe infrastructure, and flood resilience throughout the region and specifically in environmental justice areas;
5. community and youth engagement with an emphasis on the importance of water restoration in the Berkshires;
6. support to municipalities in their efforts to build climate change resilient infrastructure.

CLEAN, COLD & CONNECTED
Berkshire County

BCCC Regional Priorities

1. Our overarching ecological priority is to reconnect clean and cold waterbodies to create a greater network of continuous streams in the region.

2. Progress ecological planning in towns in the Berkshires, priority to towns with Cold Fisheries Resources (CFRs). Supporting local bylaw revisions that include Nature Based Solutions and other resiliency strategies through the towns' formal adoption of identification and management plans like Road Stream Crossing Management Plans (RSCMP).

3. Develop a regional fundraising plan including schedule of grants to apply to from the partnership

4. Build capacity within the partnership organizations and towns to restore aquatic habitats and build climate resilience.

CLEAN, COLD & CONNECTED
Berkshire County

BCCC Project Examples

- ✓ Creation of Road Stream Crossing Management Plans for Municipalities
- ✓ Assisting Municipalities with CCC Project Identification, Funding Acquisition, and Project Management
- ✓ CCC Training, Education, and Outreach
- ✓ Stream Bank and Wetland Restoration Projects
- ✓ Dam Removal Projects
- ✓ 30+ Active BCCC Projects in the Berkshires

Town-Scale Road-Stream Crossing Management Plans

1. Comprehensive NAACC Field Assessment
2. Flood Risk Analysis
3. Create Road-Stream Crossing Inventory
4. Prioritize Inventory with Municipality
    1. Flood Modeling Results
    2. Conservation Value (fish passage barriers)
    3. Town comments on Flooding and Maintenance
    4. Structural Integrity

North Atlantic Aquatic Connectivity Collaborative
NAACC

Town-Scale Road-Stream Management Plan Benefits

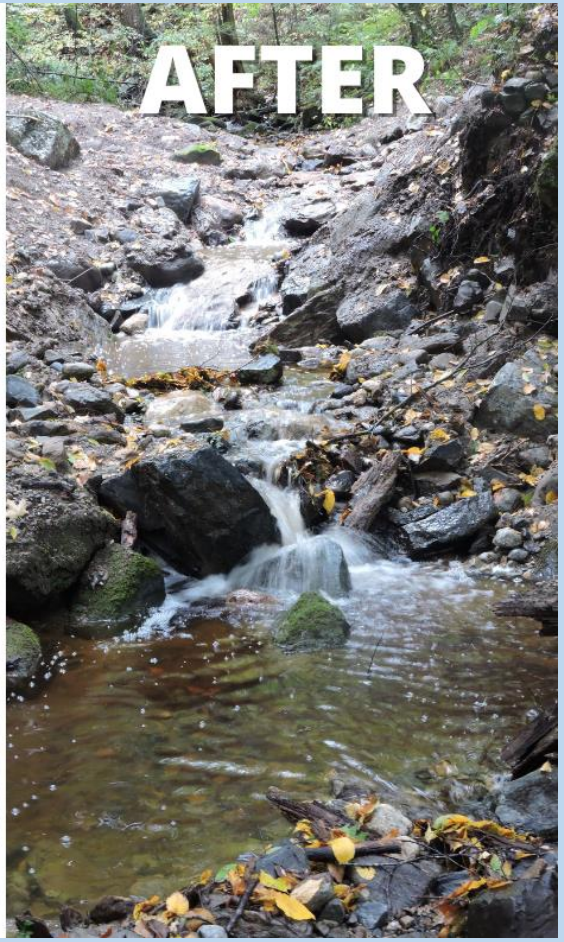
A. Strategically address climate threats:

1. combine modelling with local knowledge;
2. identify replacement projects that both reduce flood risk & reconnect important habitat
3. build local capacity to take advantage of opportunities (funding) to replace problem culverts
4. opportunities to educate highway managers and decision-makers about culvert design BMPs

Completed - 9 Berkshire Towns with RSCMPs: Alford, Egremont, Great Barrington, Lenox, New Marlborough, Pittsfield, Richmond, Stockbridge, and West Stockbridge.

In progress - 3: Becket, Otis, Sandisfield, New Marlborough.

Curtis Brook, Town of Washington
Culvert Removal



CLEAN, COLD & CONNECTED
Berkshire County

ADVANTAGES to Supported Non-Profit Partnerships

- ✓ Enhances Long-Standing Partner Relationships
- ✓ Provides Restoration Coordinator to track projects, manage BCCC grant, communicate project and grant opportunities, develop a system of long-term tracking and communication for efficiency and keep broad-based Berkshire pulse.
- ✓ Provides framework to go after larger grants, bundling projects, and sharing resources.
- ✓ Funding to build capacity.
- ✓ Technical support from partnership and DER.

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Sustaining the Vision

1. Funding – It's out there, but how do all the grants and projects get managed?
   A. Securing capacity for important functions like the following:
      - partnership coordination, connection, and management;
      - support to municipalities to manage grants and the analysis, design, and permitting process;
      - supporting municipalities to streamline, identify, and prioritize projects (RSCMP, MVP, etc.);
      - provide support staff for routine project needs to reduce costs from outside consultants.
2. Support
   A. Municipal and community outreach, education, and involvement.
   B. Federal, state, and municipal governments.

3. Continued desire for partnership participation.
   A. Delivering benefits for partner's time commitment, providing support and funding.
   B. Funding to maintain partnership communications and connections.
   C. Building and maintaining project funding sources.

CLEAN, COLD & CONNECTED
Berkshire County

For Further Information please contact…

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Opportunities and Challenges: Climate Adaptation in an Indigenous Community

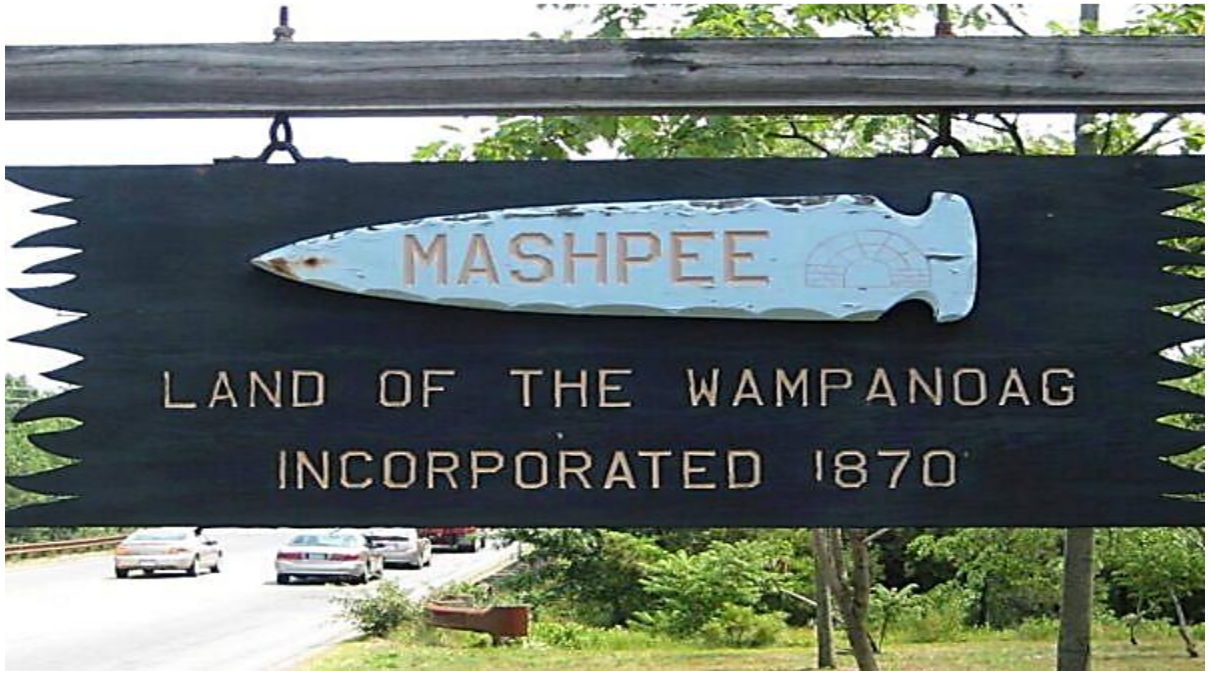
Jason Steiding

Director

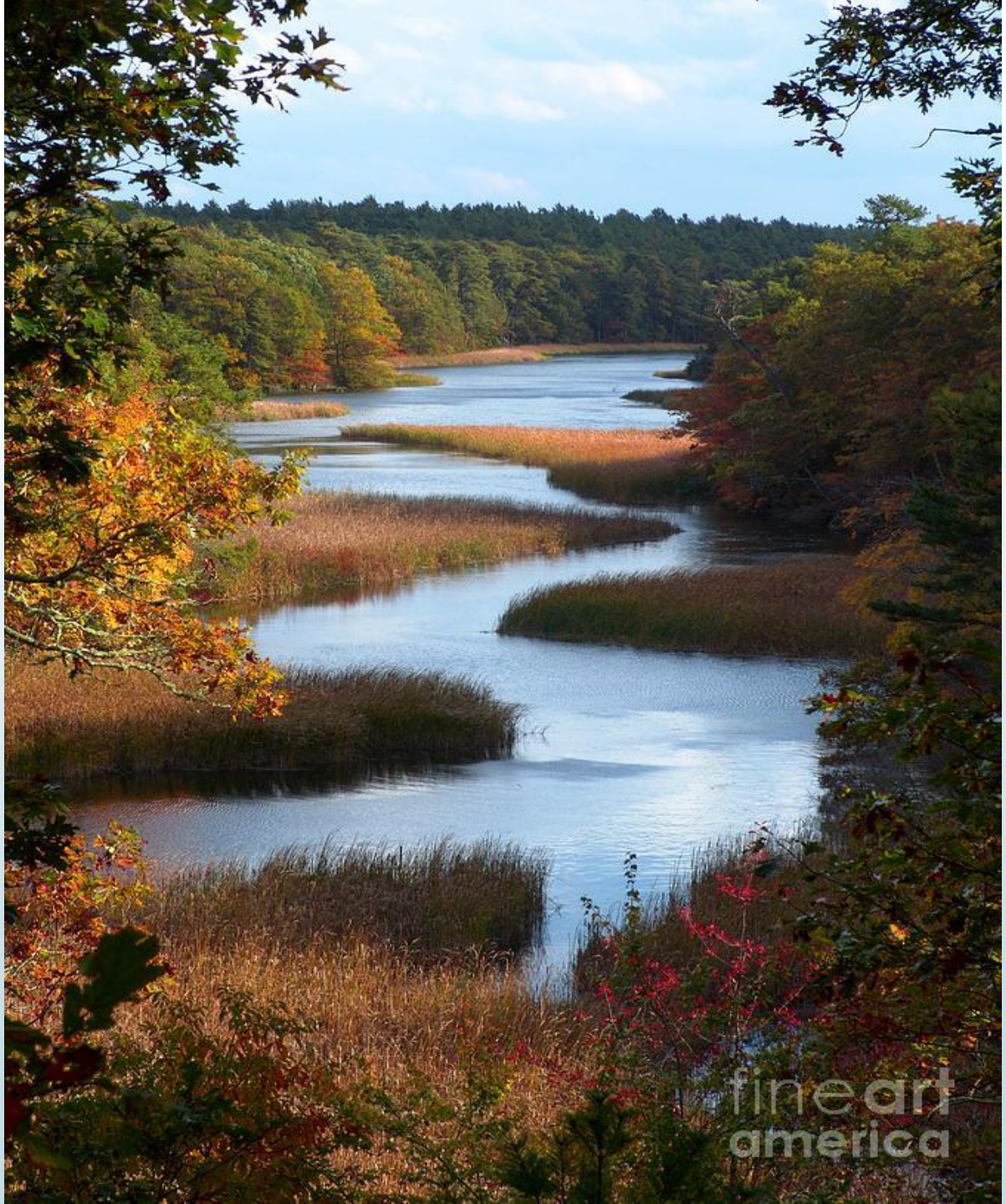
Mashpee Wampanoag Tribe

Natural Resources Department

Opportunities and Challenges: Climate Adaptation in an Indigenous Community




Historic territory of the Wampanoag Indians
Nauset Wampanoag village
(Salem) Present-day name
miles
0 10 20
Present-day shorelines shown
CANADA
ME.
VT.
N.H.
N.Y.
Gulf of Maine
Massachusetts
Area of main map
CONN.
PA.
R.I.
N.J.
ATLANTIC OCEAN
Present-day boundaries shown
Naumkeag (Salem)
Boston
Shawmut
TERRITORY OF THE WAMPANOAG
circa 1620
Mayflower landing site (Provincetown)
Meeshawm
ATLANTIC OCEAN
Patuxet
Plimoth Plantation
Cape Cod
Namasket
Cape Cod Bay
Nauset
Manomet
Pocasset
Mannamoyik
Pokanoket
Mashpee
Sakonnet
Capowak
Aquinnah
Martha's Vineyard
Nantucket Island
Nantucket


fineart
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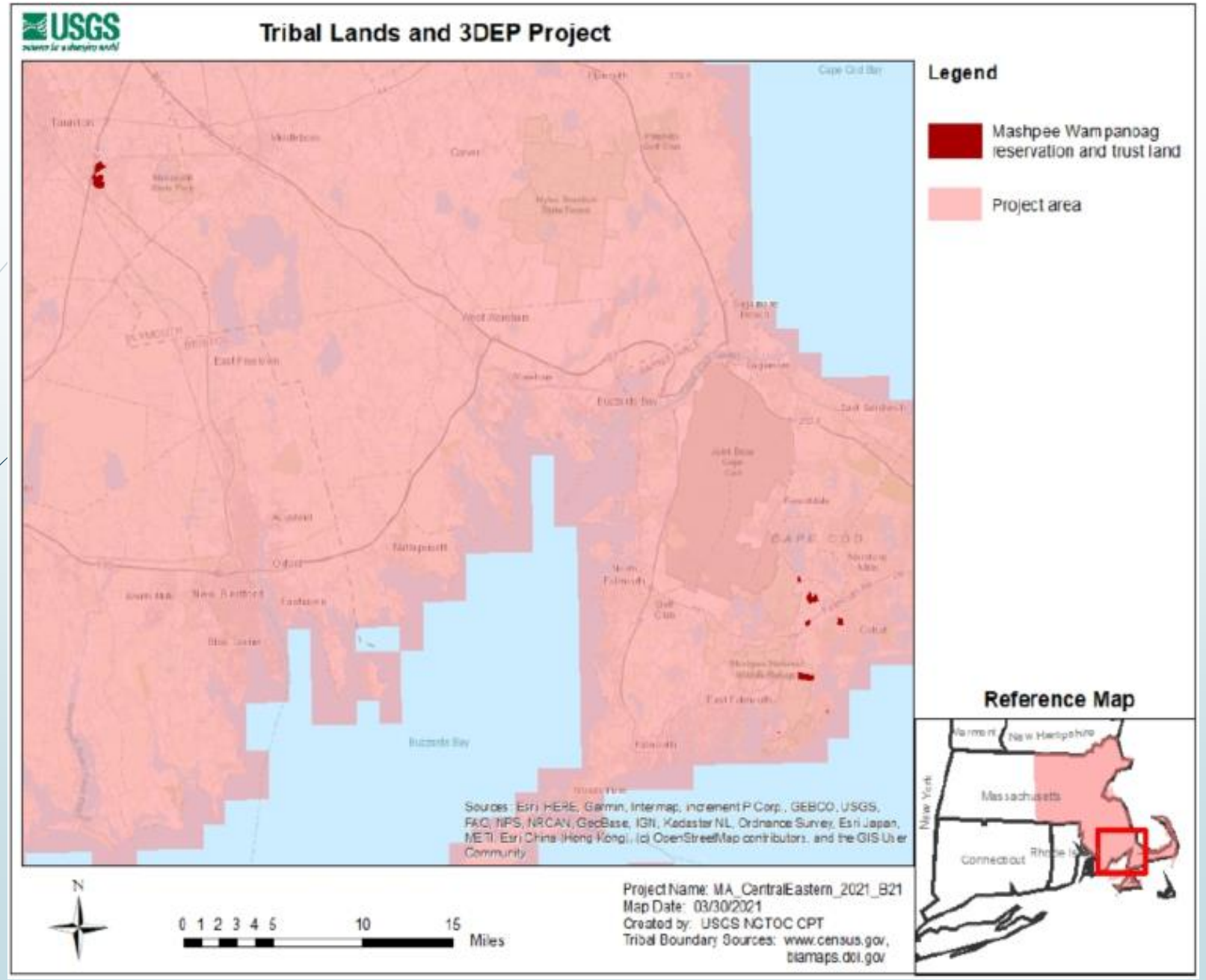

USGS
Tribal Lands and 3DEP Project
Legend
Mashpee Wampanoag reservation and trust land
Project area
Reference Map
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
N
0 1 2 3 4 5 10 15
Miles
Project Name: MA_CentralEastern_2021_B21
Map Date: 03/30/2021
Created by: USGS NCTOC CPT
Tribal Boundary Sources: www.census.gov, biamaps.doi.gov
Vermont
New Hampshire
New York
Massachusetts
Connecticut

Regional Collaboratives for Proactive Retreat, Relocation, and Restoration in New England
NOAA Coastal Resilience Regional Challenge Proposal

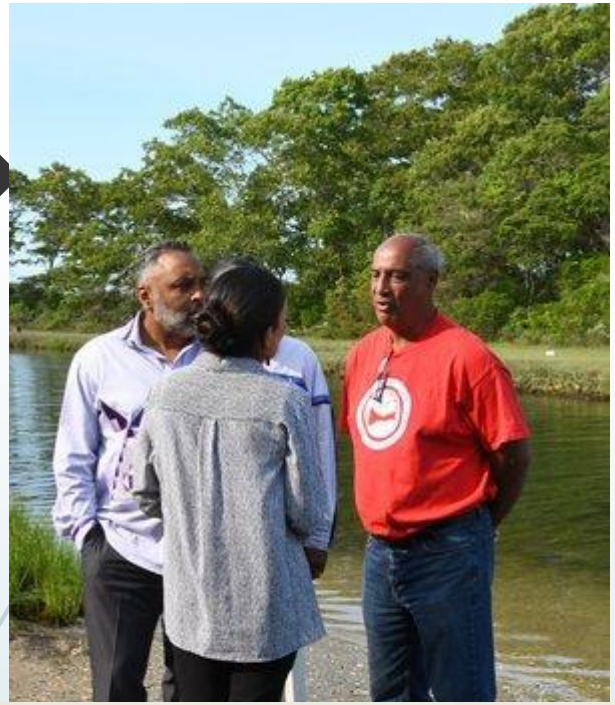
Massachusetts ResilientCoasts Regional Collaborative

Bolster collaborative, proactive, community-led planned relocation as a nature-based climate adaptation strategy

Help communities adapt to increasingly severe coastal hazards in the Northeast

Mashpee Wampanoag Tribe will bring Tribal perspectives, history, and Tribal Ecological Knowledge into the planning, resource development, and workshop programming.

Specific focus on engaging Tribal Elders, Native Environmental Youth Ambassadors and Tribal “culture keepers” who bring cultural, historical and anecdotal data to the planning process.



Community Engagement and Capacity Building

Two (2) five-year grants. Each will:

Support the efforts of the MWT NRD

Fund community engagement and outreach events

Reimburse Tribal community members for their TEK - $ 91,000 over 5 years back into the community

Pay for a Full Time NRD Field Assistant for 5 years

Santuit Pond Restoration Mashpee, MA

Jason Steiding, Mashpee Wampanoag Tribe

Dale Oakley, Mashpee Wampanoag Tribe

Ashley Fisher, Town of Mashpee

Kimberly Groff, SNEP Network

Project Partners & Contributors

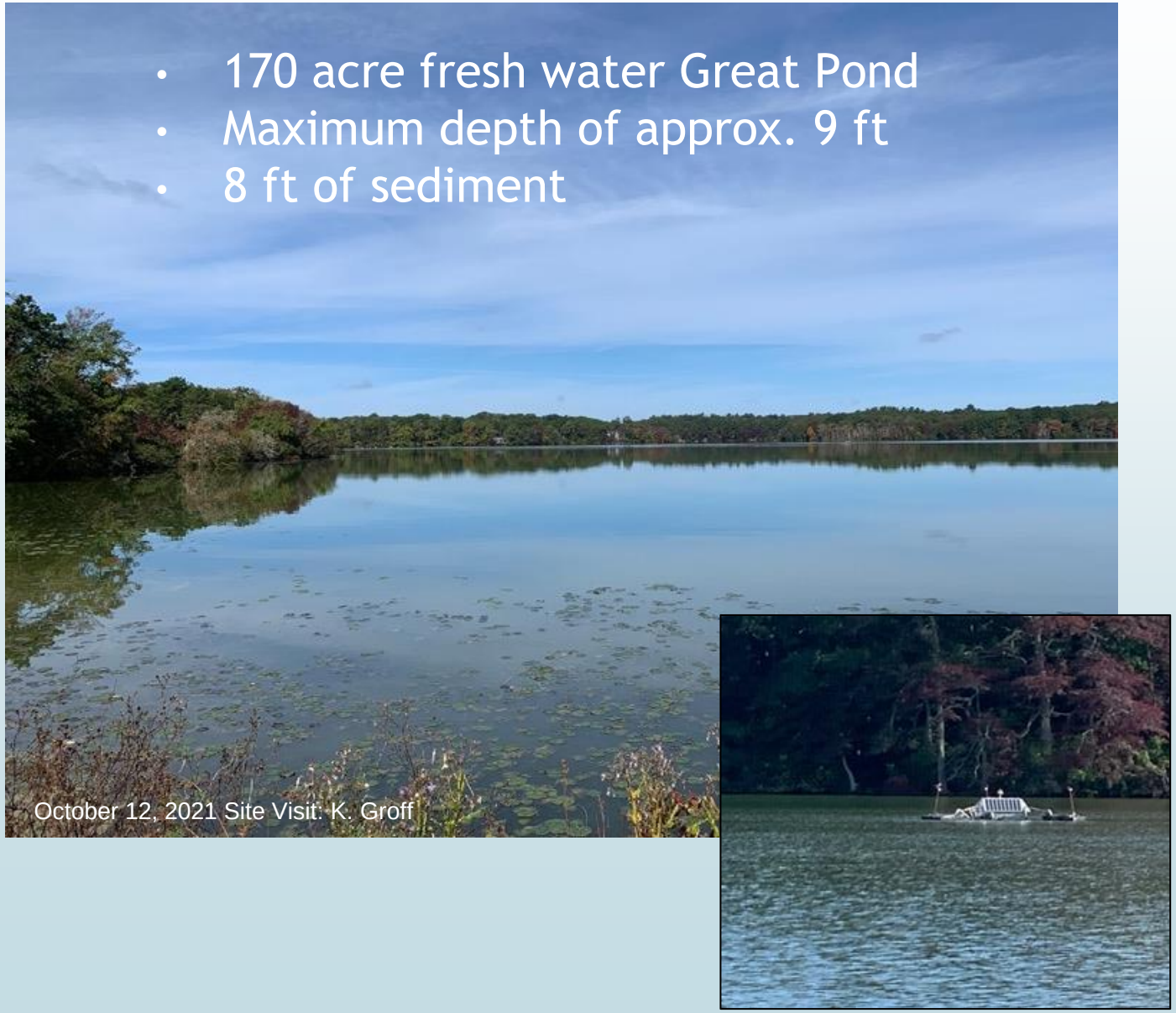
Santuit Pond Water Quality

Problems are decades in the making and have been documented for decades

The pond is listed on "Massachusetts List of Impaired Waterbodies" for fish passage, abnormal fish deformity, chlorophyll-a, nutrient eutrophic biological indicators, pH, total phosphorus, and clarity.

Total Phosphorus – 50-500 ug/L

Lake DPH swimming advisory due to HABs



SNEP Network Technical Assistance Scope

- *Training (Town and Tribe)* to develop conceptual design(s) for stormwater retrofits and green infrastructure solutions to address identified problems
- *Contractor assistance* to evaluate interim measures to address the phosphorus loading in Santuit Pond
- *Santuit Pond Watershed Based Plan* using the MassDEP WBP Tool kit

History of the Wampanoag Tribe

And the Significance of Santuit Pond

The Old Indian Meetinghouse, 1969.

The name "Santuit" comes from the Wampanoag word meaning "Place of the Sachems". Briant's Neck, the peninsula on the western shore of the pond was the original site of the Old Indian Meetinghouse. Built in 1684 and eventually moved by oxcart to its present location on Meetinghouse Rd in 1717, Old Indian Meetinghouse was the first Native American church in North America.

The Santuit Pond was a place where traditionally chiefs and tribal members alike gathered to discuss important matters and even trade goods. This is because the Santuit was a place of great sustenance and agriculture for the Wampanoag People! The soil was a loamy sand, as good as it got on the Cape. Herring, trout, and eels were in abundance in the pond. Herring were gathered for their roe and fresh meat. They were dried, salted and smoked for consumption through the winter. Herring remain a staple of the Wampanoag diet to this day, and the Wampanoag people still celebrate the arrival of the migratory fish to the Santuit River.

Trout Grave

Retold by Earl Mills Sr.

A long, long time ago there was a trout who lived in the South Sea near the shores of Cape Cod. The trout was very big, almost the size of a man. He was the chief of all trout in the area, and was called the Great Trout.

There was a maiden named Ahsoo who lived in the village of Mashpee among the Wampanoag women. She was not a very pretty woman. In fact, she was quite unusual looking and not desired by local men. Naturally Ahsoo became unhappy and very lonely. However, she had an unusual gift from the Great Spirit — her beautiful voice. She could sing as no one else could. Ahsoo sang so powerfully that the birds would fly from faraway placed just to hear her voice. Her songs were so unusual that the Mashpee River would become almost still to listen.

Every summer evening, when darkness would come and hide her lack of beauty, Ahsoo would sit near the river and sing her songs. The birds would fly closer to her. Rabbits, deer and other animals would come out of the woods, and fish would swim near the bank of the river. The Great Trout heard her, too, but he had to satisfied listening from a distance, as he was too big to swim in the shallow waters near the place wear Ahsoo was singing. He would wait every evening to hear her sing, and every evening he became more fond of her voice. He loved her voice so much that he could not imagine that she was not beautiful or kind of heart. In fact, he was so sure of it that he fell deeply in love with her and dreamed of taking her for his wife.

It was not long before all the animals of the woods learned about the love of the Great Trout, and so did Ahsoo, the Maiden of Mashpee. She had never been loved before and quickly fell in love with the Great Trout as well. She even invited him to visit her wigwam, which was a sure sign that she wanted to be his wife. Her songs became even more beautiful and were filled with longing for her lover.

After a while the situation became unbearable for the Great Trout. He decided to visit the Indian Chief, who lived near the marshes of Popponesset Bay, to ask for his words of wisdom .

"I can see sorrow in your heart, Great Trout," spoke the Wampanoag Chief, "and I think I know the reason."

"Oh," cried the Great Trout, "Ahsoo and I are in love and we long for each other so much that it is unbearable. But we are doomed, as neither of us can live where the other lives. What shall we do?"

The Wampanoag chief was silent for a while. "I feel sorry for you both, as I believe that such a great love as yours should have the chance to be fulfilled," he spoke. "So today I give you my promise of help. Go in peace, Great Trout, to your fish people and wait for my decision." And so the Great Trout went back with hope in his heart.

A few days later the Wampanoag chief changed Ahsoo into a fish and placed her in the waters of Santuit Pond. Then, knowing how powerful the Great Trout was, the chief told the Great Trout to dig his way from the South Sea to Santuit Pond and join Ahsoo there.

"I wish you good luck, Great Trout, but be aware that power is blinding and use your strength wisely." Such were the last words of the Indian chief for the Great Trout.

The Great Trout was very happy in anticipation of uniting with Ahsoo, and he started to dig the sand with the greatest power he could muster. He dug and he dug and he dug without any rest. And when he felt that Santuit Pond was near, he dug the sand with even greater vigor, forgetting the warning of the Indian Chief. And when he finally reached his destination, the Great Trout was so exhausted that he died from the effort before ever having a chance to glance at his love.

Poor Ahsoo was so devastated by his death she died the same day of a broken heart.

The Mashpee Wampanoags found the dead bodies of the unfulfilled lovers and buried them side by side so they could be together in spirit forever. The mound where Ahsoo and the Great Trout were buried is known as the Trout Grave and can be found on the hillock overlooking Santuit Pond and the Santuit River.

Former Wampanoag Leader and author of the "*Trout Grave*", Earl 'Flying Eagle' Mills Sr., Chief.

Yellow perch caught on the sandy shores of Santuit Pond in 1950s. *Picture courtesy of Emma Jo Mills Brennan.*

Fishing off a dock in Santuit pond, 1950s. Wildlife was abundant and diverse. *Picture courtesy of Emma Jo Mills Brennan.*

To learn more about the significance of Santuit Pond to the Wampanoag Tribe, please scan the QR code to watch a public service announcement to hear directly from tribal members.

This project was funded by the Municipal Vulnerability Preparedness Program in accordance with the State of Massachusetts with help from partners Mashpee Natural Resources, Mashpee Wampanoag Natural Resources, Fuss and O'Neil, Mashpee TV, and Mashpee Middle High School.

SNEP Network Technical Assistance

Empowering communities to achieve healthy watersheds, sustainable financing and long-term climate resilience through management of stormwater and restoration projects.


October 12, 2021 Site Visit: K. Groff

- Meet communities where they are at
- Engagement to find solutions
- Overcome barriers to implementation
- Build local capacity
- Advance implementation

ResilientCoasts Strategy

Managing Impacts of Sea Level Rise and Coastal Storms Across the Massachusetts Coast

Julia Knisel

Coastal Shoreline and Floodplain Manager

Massachusetts Office of Coastal Zone Management (CZM)

ResilientCoasts Strategy

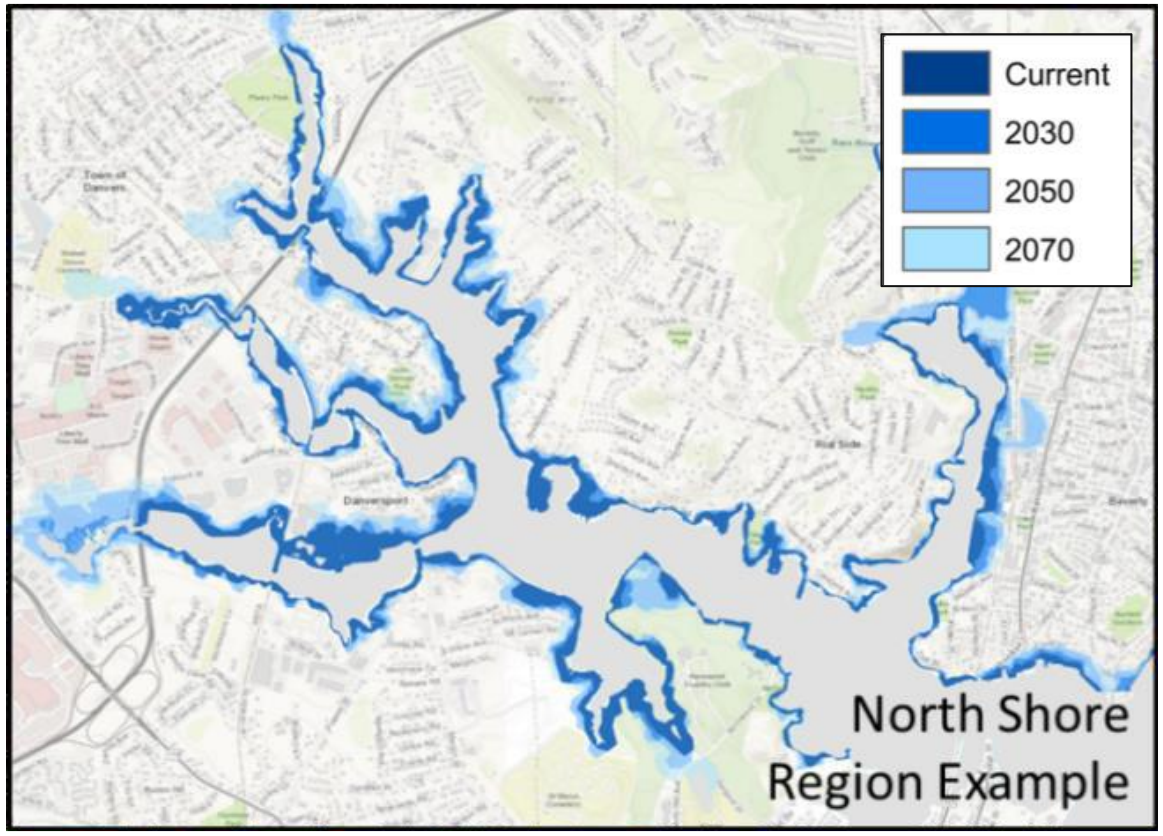
Managing impacts of sea level rise & coastal storms across the Massachusetts coast

CZM

ResilientCoasts

Julia Knisel
March 15, 2024

MA CLIMATE CHANGE ASSESSMENT (DEC 2022)



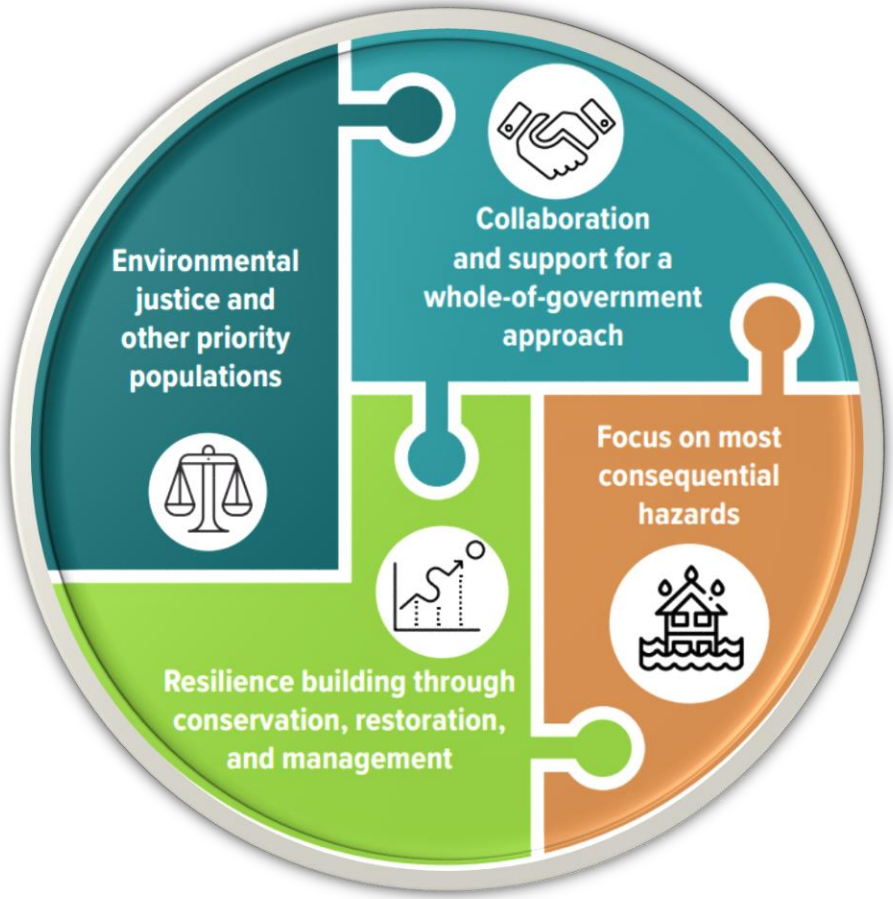
EXCERPT OF FIGURE 12. AREA EXTENT OF 1% ANNUAL CHANCE (100-YEAR) FLOOD

KEY FINDINGS ABOUT OUR COAST

- Coastal impacts on people & ecosystems are increasing due to sea level rise & changing coastal storms
- During extreme storms, road flooding causes delays in emergency response, potentially leading to loss of life
- Storm surge & coastal erosion cause property & infrastructure damages
- Sea level rise leads to coastal habitat shifts & loss of salt marshes & beaches

www.mass.gov/info-details/massachusetts-climate-change-assessment

RESILIENTMASS PLAN (SEP 2023)



RECOMMENDED ACTION LED TO RESILIENTCOASTS

- Plan identifies actions state agencies will take to address risks to human health & safety, communities, critical assets & infrastructure, natural resources, governance & economy
- Develop a coordinated, equitable & effective coastal resilience strategy in partnership with coastal municipalities & other coastal stakeholders

www.mass.gov/info-details/2023-resilientmass-plan

COORDINATION OPPORTUNITY

RESILIENTMASS ACTION TEAM (RMAT)

- State interagency working group responsible for implementation, monitoring & maintenance of ResilientMass Plan
- Led by Executive Office of Energy & Environmental Affairs & MA Emergency Management Agency
- Representatives & staff from each Secretariat including economic development, health, housing & transportation
- Provide outreach, technical assistance & stakeholder engagement
- Coordinate collaborative partnerships
- Support incorporation of plan into other state plans & programs

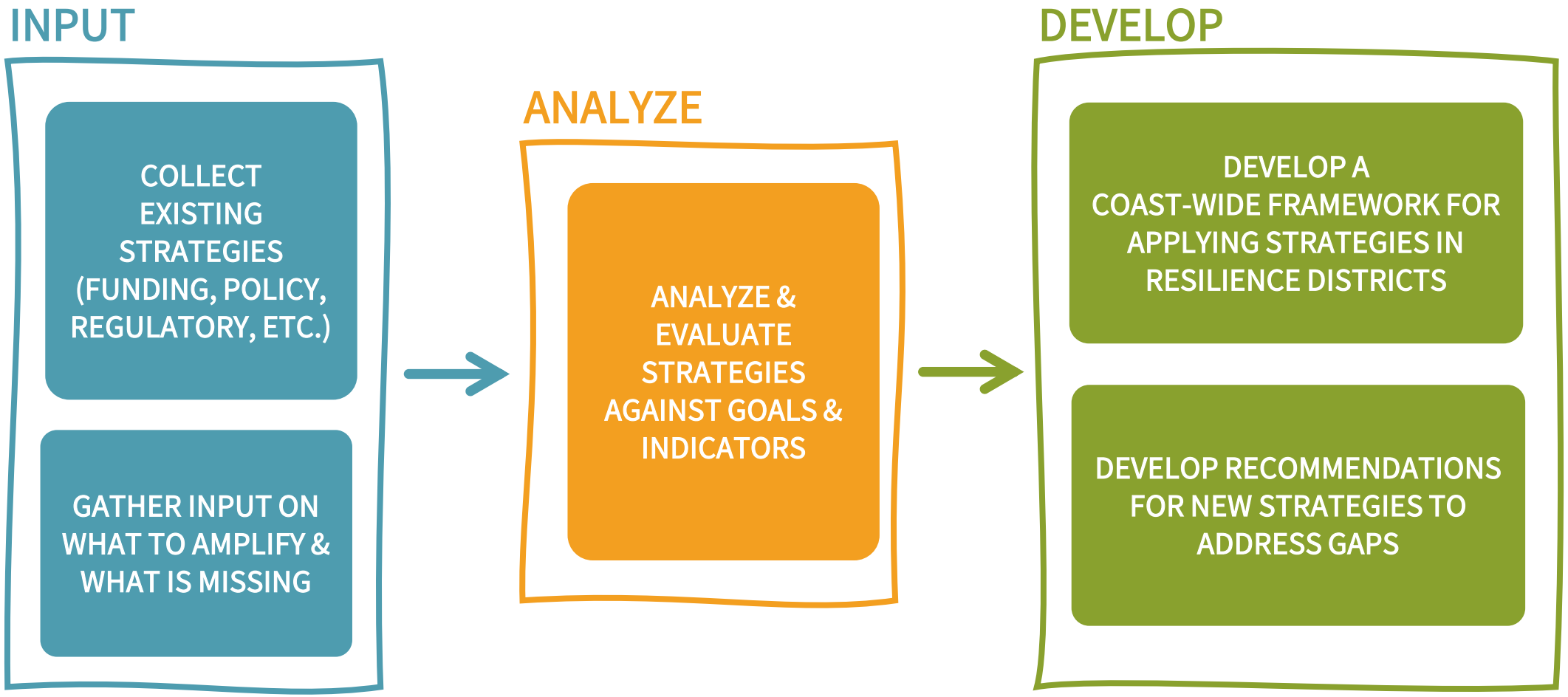
RESILIENTCOASTS PLAN (LAUNCHED NOV 2023)

- **State lead:** EEA - Executive Office of Energy & Environmental Affairs & CZM - Office of Coastal Zone Management
- **Purpose:** guide state & local coastal resilience policy & management actions
- **Process:**
  - ***Describe a vision/goals*** & metrics for a resilient coast
  - ***Map geographic zones*** of climate vulnerability or "coastal resilience districts"
  - ***Evaluate current & new strategies*** & how they could be applied to different districts
  - ***Develop recommendations*** to guide management of vulnerable areas at state & local level

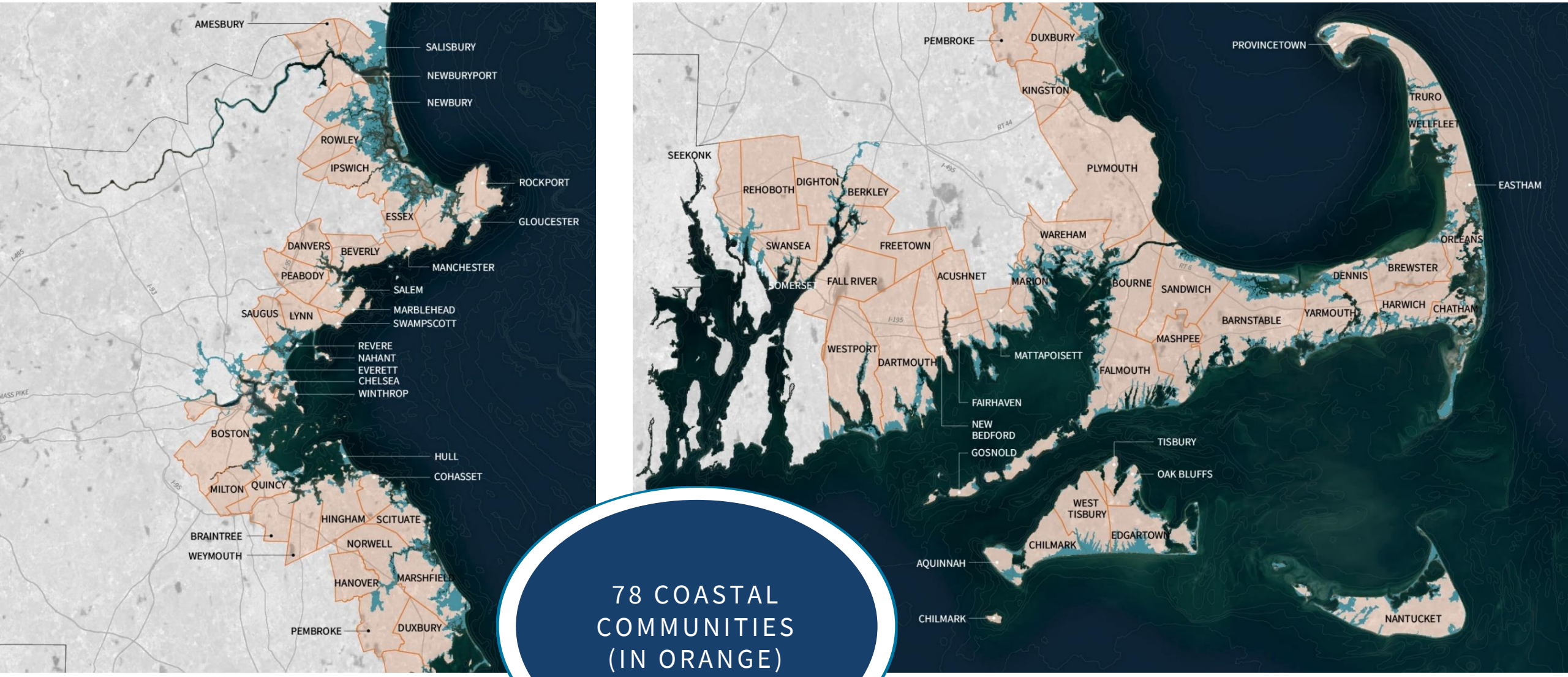
STAKEHOLDER ENGAGEMENT

- Internal Agency Working Group
- External Task Force: academic, business, environmental, environmental justice, insurance, legislative, municipal, philanthropy, real estate & regional planning
- Community Liaisons
- Public meetings & surveys
- Focus groups & interviews

PLANNING APPROACH



PLANNING REGION BASED ON 2030 COASTAL FLOOD RISK



78 COASTAL COMMUNITIES (IN ORANGE)

2070 COASTAL FLOOD RISK EXPANDS REGION

78 COASTAL COMMUNITIES + 20 ALONG RIVERS

Extent of Coastal Resilience Districts in blue

GOALS FOR A RESILIENT COAST

GOAL 1: Improve **human health and safety**

GOAL 2: Protect and enhance the value of **natural and cultural resources**

GOAL 3: Increase resiliency of **built infrastructure functions**

GOAL 4: Strengthen the **coastal economy**

GOAL 5: Advance **equity** and **environmental justice**

GOAL 6: Support the **capacity of coastal communities**

INDICATORS TO EVALUATE PROGRESS TOWARDS GOALS

EXAMPLES

- **Health & safety:** accessible evacuation routes & reliable emergency response during coastal storm events
- **Natural resources:** reduced long-term erosion of beaches, dunes & coastal banks
- **Infrastructure:** reduced damages to coastal infrastructure & buildings
- **Economy:** commercial & industrial areas & activities maintain operations during king tides & minor coastal storms
- **Environmental justice:** new affordable housing isn't exposed to coastal flooding & erosion
- **Community capacity:** coastal communities have received technical & financial support on coastal resiliency issues

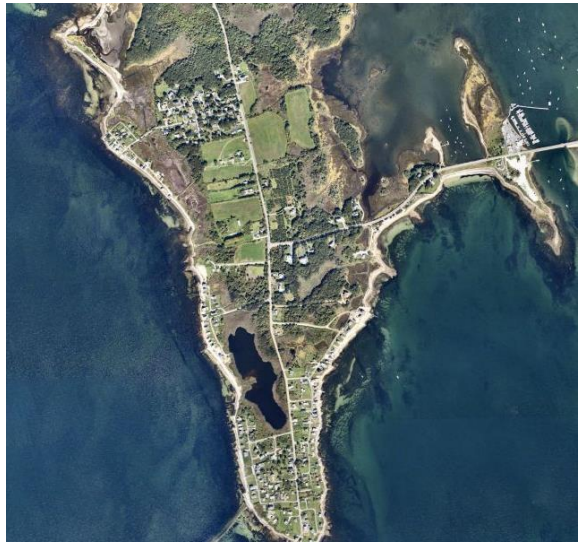
WHAT ARE COASTAL RESILIENCE DISTRICTS?

Neighborhoods & natural systems that have different landscape characteristics & face different climate hazards

THE POINT/EL PUNTO
SALEM

Retrofit of coastal structures to protect environmental justice neighborhood

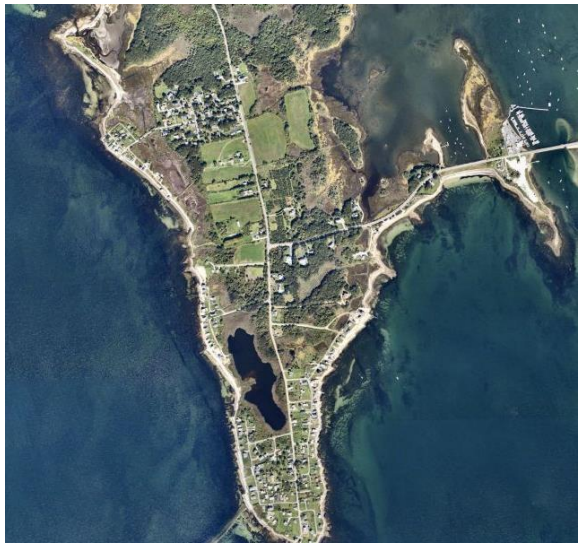
SCONTICUT NECK
FAIRHAVEN



Land acquisition for public access & marsh migration in rural area

SANDY NECK BEACH
BARNSTABLE

Shoreline restoration with infrastructure relocation for recreation on a barrier beach

	THE POINT/EL PUNTO	SCONTICUT NECK	SANDY NECK BEACH
			
NATURAL RESOURCES	Low	Medium	High
LAND USE & ECONOMY	High density	Medium density	Low density
COASTAL EROSION	Stable	Eroding	Eroding
COASTAL FLOODING	Moderate	High	Moderate
ENVIROMENTAL JUSTICE	Yes	No	No
HISTORIC & CULTURAL RESOURCES	Yes	Yes	Yes

DATA SUPPORTING CREATION OF DISTRICTS

PRIMARY

NATURAL RESOURCES

- Existing coastal wetlands
- Potential future coastal wetlands

COASTAL EROSION

- Shoreline change
- Coastal bank loss
- Seawalls & other coastal structures

LAND USE & ECONOMY

- Density of development

COASTAL FLOODING

- Near-term (2030)
- Long-term (2070)

SECONDARY

ENVIRONMENTAL JUSTICE

- Low income & minority populations with language barriers

HISTORIC & CULTURAL RESOURCES

- Archaeological sites, historic buildings & cultural landforms

FINANCING ACTION

RESILIENTMASS FINANCE STRATEGY IN DEVELOPMENT

- Research & recommendations for new funding & finance mechanisms for resilience action
  - Mechanisms for funding resilience action in Coastal Resilience Districts
  - Resilience funding options for water-dependent industrial infrastructure in Designated Port Areas
  - Blue carbon credits for restoration of salt marshes
  - Environmental impact bonds
  - Loan options for homeowners to access federal assistance for floodproofing & elevating
- Impact analysis of recommended options
- Implementation roadmap

NEXT STEPS

- Indicators are being refined based on input from public meetings & survey
- Possible strategies for a resilient coast will be discussed at a public meeting this spring
- For more info: www.mass.gov/info-details/resilientcoasts-initiative

MODERATED DISCUSSION

Panel Moderator: Beth Lambert, Forum Co-Chair
Director, Division of Ecological Restoration, Department of Fish and Game
Commonwealth of Massachusetts

Panelists:

- **Kate Bednaz**, Berkshires Clean Cold Connected Partnership
- **Violeta Duncan**, Duncan Núñez Consulting, LLC
- **Michael Jastremski**, Housatonic Valley Association
- **Julia Knisel**, CZM
- **Stephanie Page**, Oregon Watershed Enhancement Board
- **Erik Reardon**, Housatonic Valley Association
- **Jason Steiding**, Mashpee Wampanoag Tribe Natural Resources Department