From Vision to Action—Applying Future Scenarios to Inform Local Initiatives

2018 RCP Network Gathering
UMass Amherst

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Mass Audubon
Shaping the Future of Your Community

Overview

Jonathan Thompson, Harvard Forest

Intro - New England Landscape Scenarios 2060

Heidi Ricci, Mass Audubon, Shaping the Future of Your Community Program

- **Land and Water – Future in a Changing Climate**
  - Valuing natural lands for resiliency and ecosystem services
- **Applying Future Scenarios – Informing and motivating action**
  - Sprawl
  - Imperviousness and water
  - Resilient Lands
- **Regional Partnership Applications**
  - Narragansett Bay Watershed
  - Resilient Taunton Watershed Network
- **Discussion**

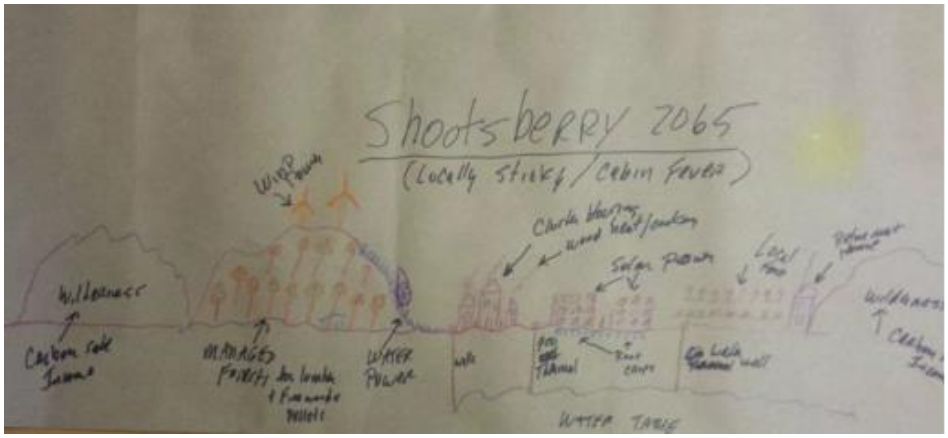
1. *How might our landscape change over the next 50 years?*

2. *What are the possible consequences for ecosystems and people?*

3. *What actions could help sustain important ecosystem functions and services in the face of change?*

New England Landscape Futures

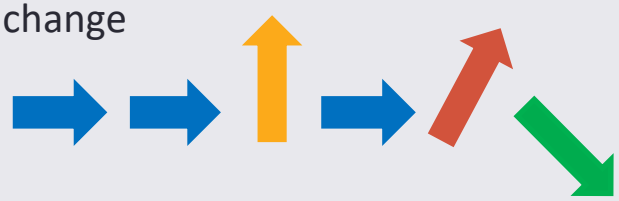
- Co-designed land-use scenarios with informed stakeholders from throughout the region
- More than 50 phone interviews
- Day-long workshops in each New England State
- Many interactive webinars



The Scenario-building Process

(1)

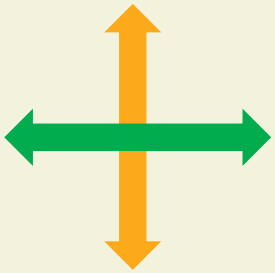
(2) Identify key drivers of change



(3) Rank drivers by impact & uncertainty

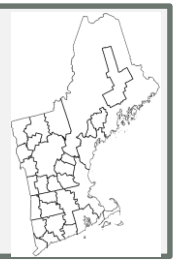
high
medium
low

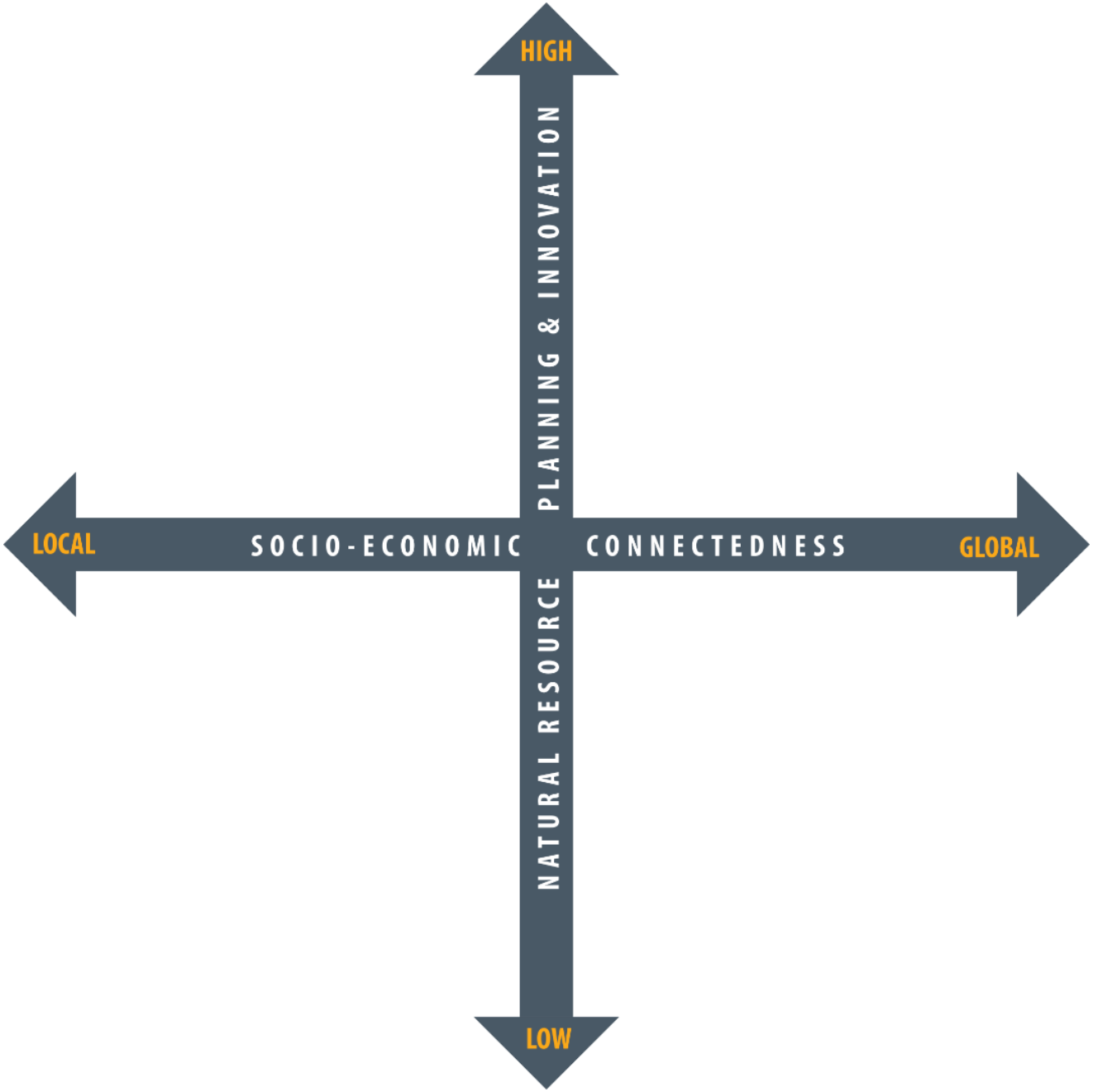
(4) Create scenario logic and matrix



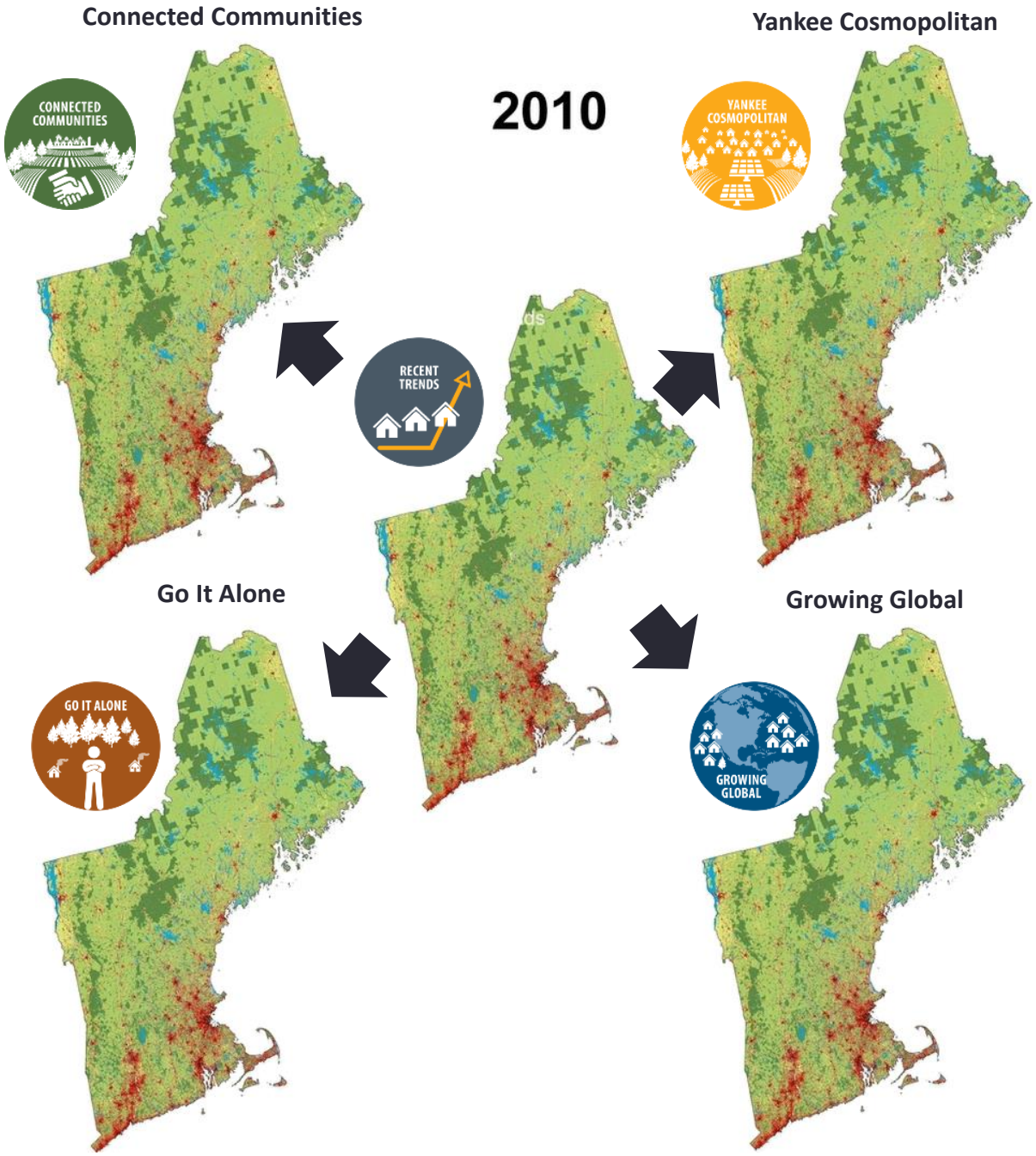
(5) Develop scenario narratives

(6) Contrast scenario with recent land-use trends



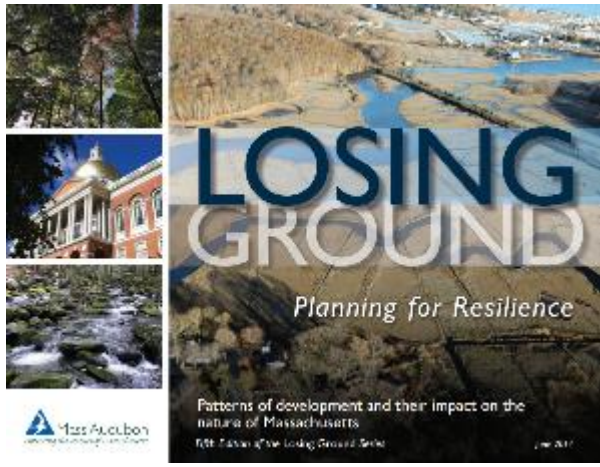

HIGH
PLANNING & INNOVATION
LOCAL
SOCIO-ECONOMIC
CONNECTEDNESS
GLOBAL
NATURAL RESOURCE
LOW


HIGH
LOW
LOCAL
GLOBAL
PLANNING & INNOVATION
NATURAL RESOURCE
SOCIO-ECONOMIC CONNECTEDNESS
CONNECTED COMMUNITIES
Connected Communities
• Localized world economy
• High innovation
• Renewable energy
• Proactive government planning
• Ecosystem services highly valued
• Stable population
• Smart growth works
• Infrastructure investments serve local needs
YANKEE COSMOPOLITAN
Yankee Cosmopolitan
• Globalized world economy
• High innovation
• Renewable energy
• Proactive government planning
• Some ecosystem services highly valued
• High immigration
• Smart growth becomes sprawl, especially in the south
• Infrastructure investments serve global needs
Go It Alone
• Localized world economy
• Low innovation
• Convenient, high-cost energy
• Low government planning
• Low value of ecosystem services
• Stable population
• Limited but sprawling development
• Decay in infrastructure
• Reduced mobility
GO IT ALONE
Growing Global
• Globalized world economy
• Low innovation
• Convenient cheap energy
• Low government planning
• Low value of ecosystem services
• High immigration
• Rapid sprawling development
• Investment in conventional infrastructure
GROWING GLOBAL

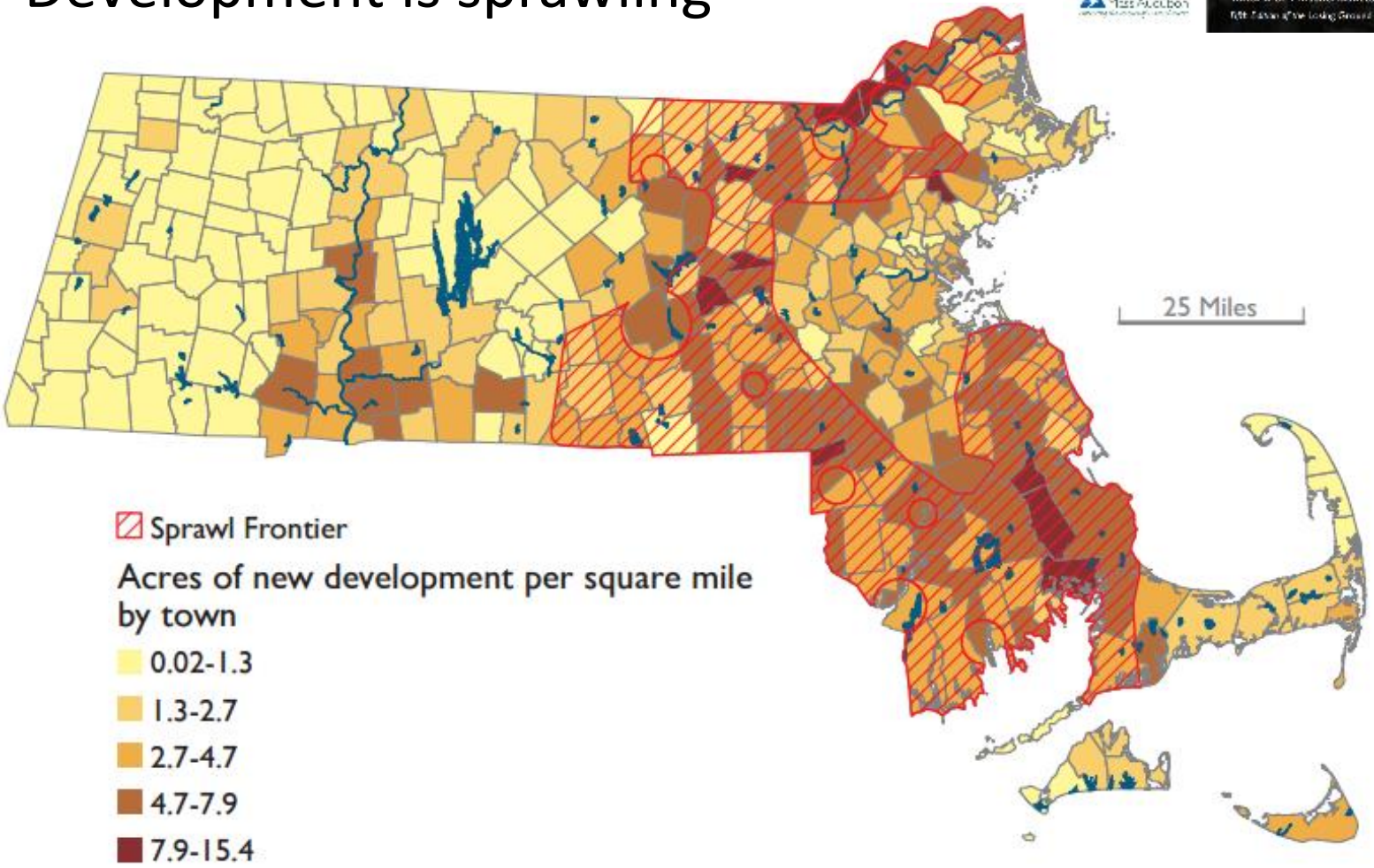

Connected Communities
Yankee Cosmopolitan
2010
CONNECTED COMMUNITIES
YANKEE COSMOPOLITAN
RECENT TRENDS
Go It Alone
Growing Global
GO IT ALONE
GROWING GLOBAL

Applying Land Use Trends and Scenarios to inform local and regional action

What's the problem?

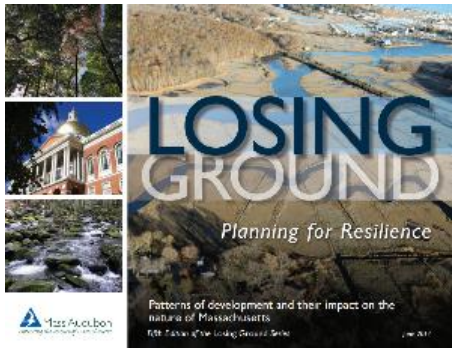


Development is sprawling



Shaping The Future of Your Community Program

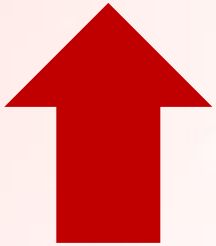
Created in 2009 to implement *Losing Ground* recommendations

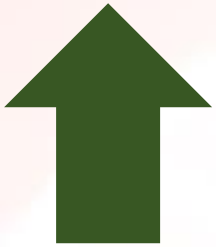


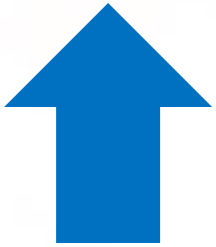
Assists the fastest-developing communities chart a more **sustainable future** through customized community workshops and direct assistance

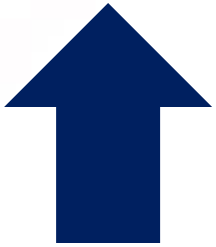
Shaping the Future of Your Community

Our climate is already changing

Temperature:  **2.9°F** Since 1895

Growing Season:  **11 Days** Since 1950

Sea Level Rise:  **11 inches** Since 1922

Strong Storms:  **55%** Since 1958

Sources: Fourth National Climate Assessment, NOAA Ocean Service, NOAA nClimDiv dataset, ACIS

Climate change

Sprawling Development

increased precipitation

increased temperature

impervious surfaces

stormwater & WQ issues

flooding & infrastructure damage

heat-related illnesses

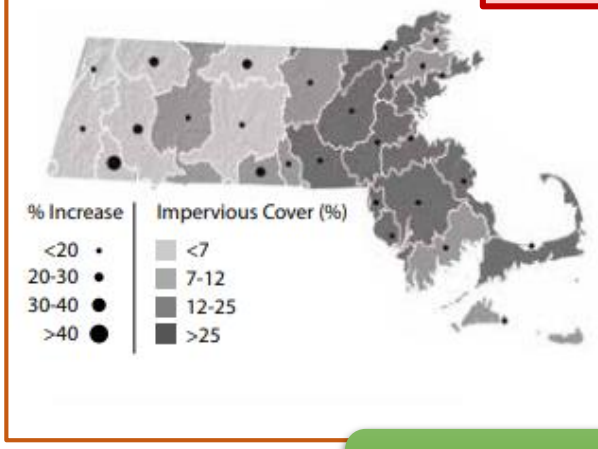
fish and aquatic life impacts

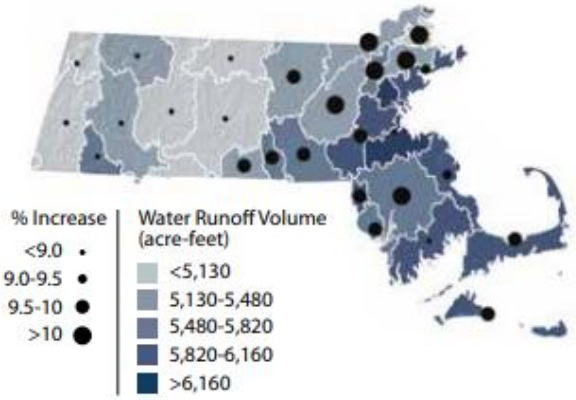
Forests for Resiliency and Values

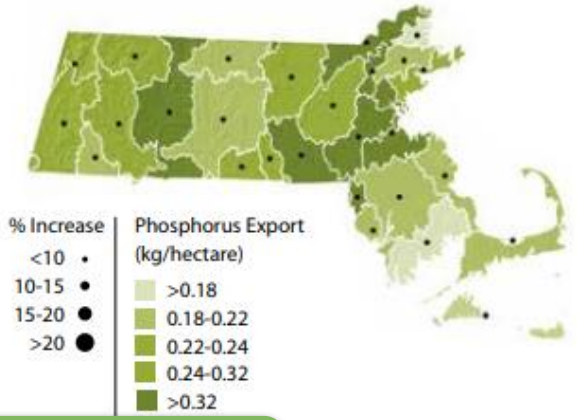
- Carbon sequestration
- Clean Water
- Flood prevention
- Habitat
- Tourism
- Recreation
- Health
- Property Values
- Quality of Life

The Value of Green:
Imperviousness, Runoff, Nutrients

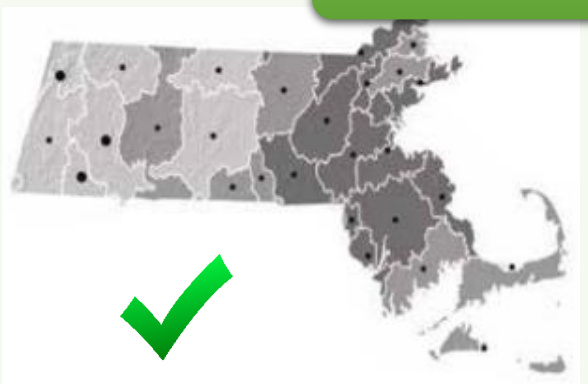
If we continue to follow recent trends, in 2060:

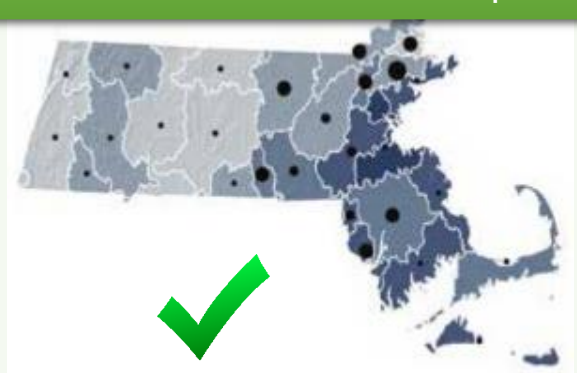


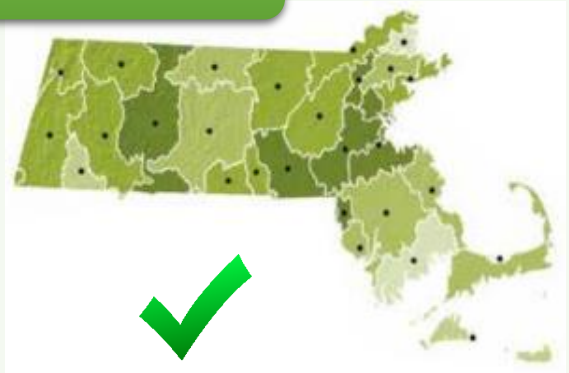




These allow for nearly the **same amount of development,**
but 2/3 of it is **clustered** development

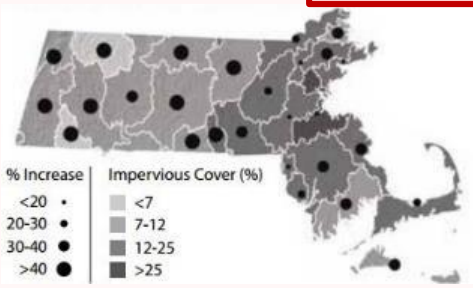


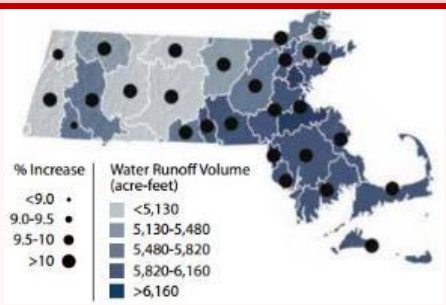


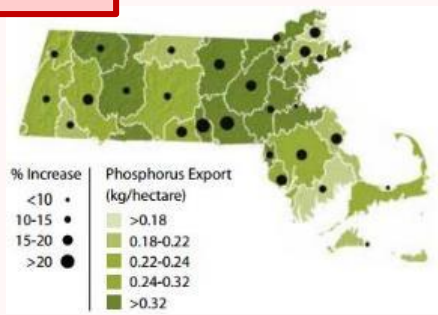


The Value of Green:
Imperviousness, Runoff, Nutrients

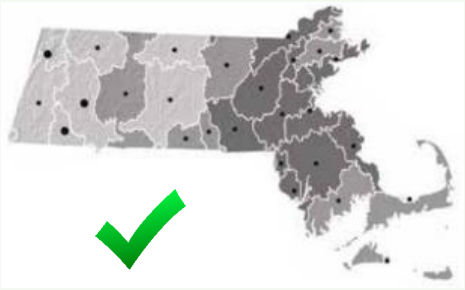
If we follow opportunistic growth, in 2060:

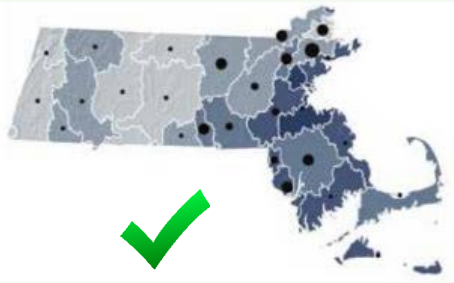


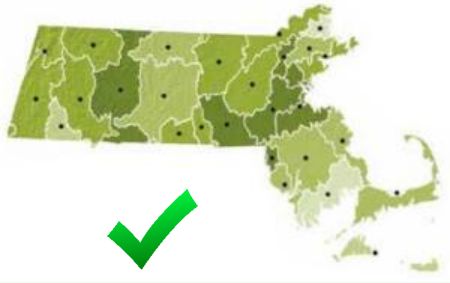




If we value forests as infrastructure, in 2060:



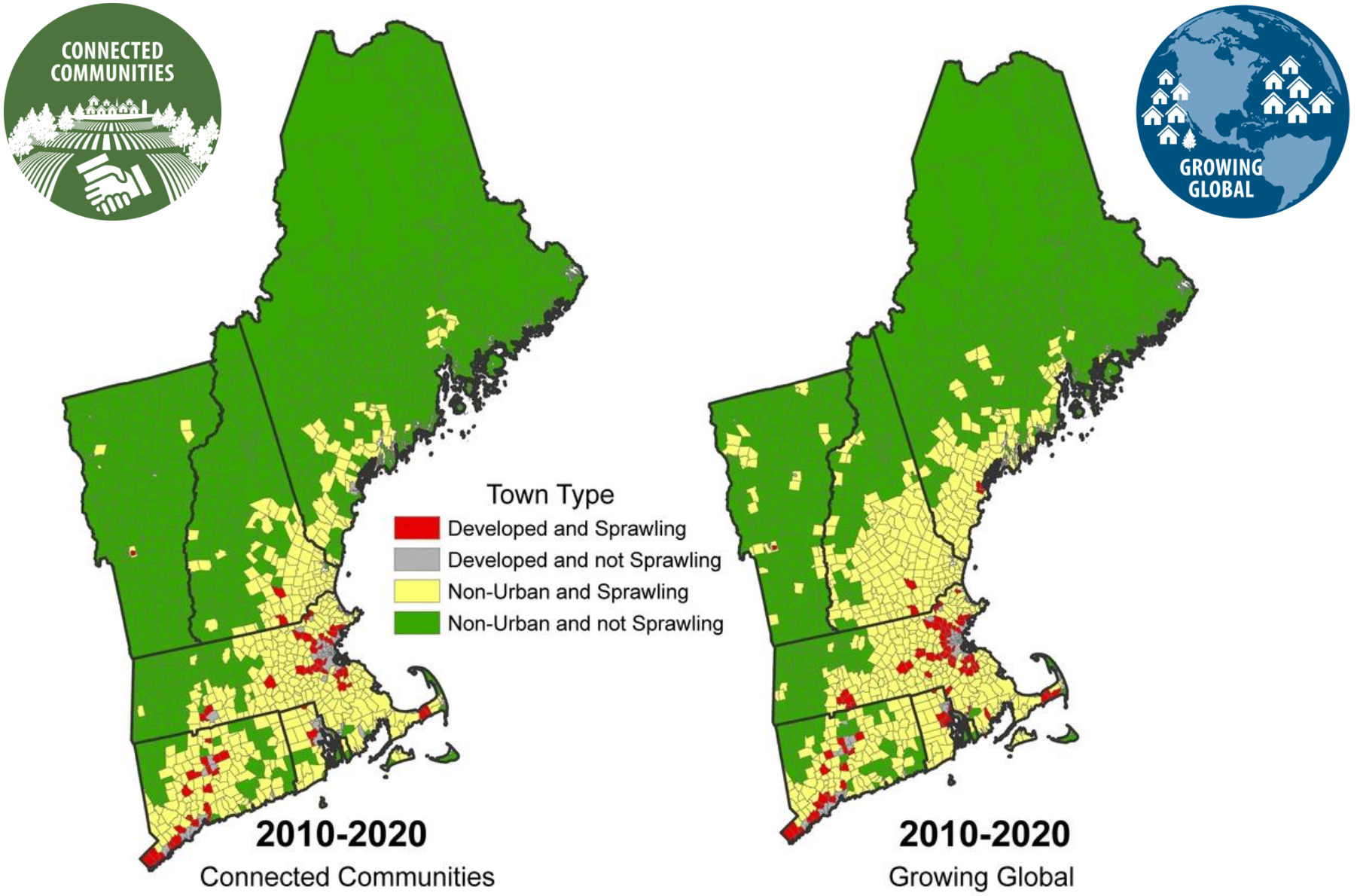




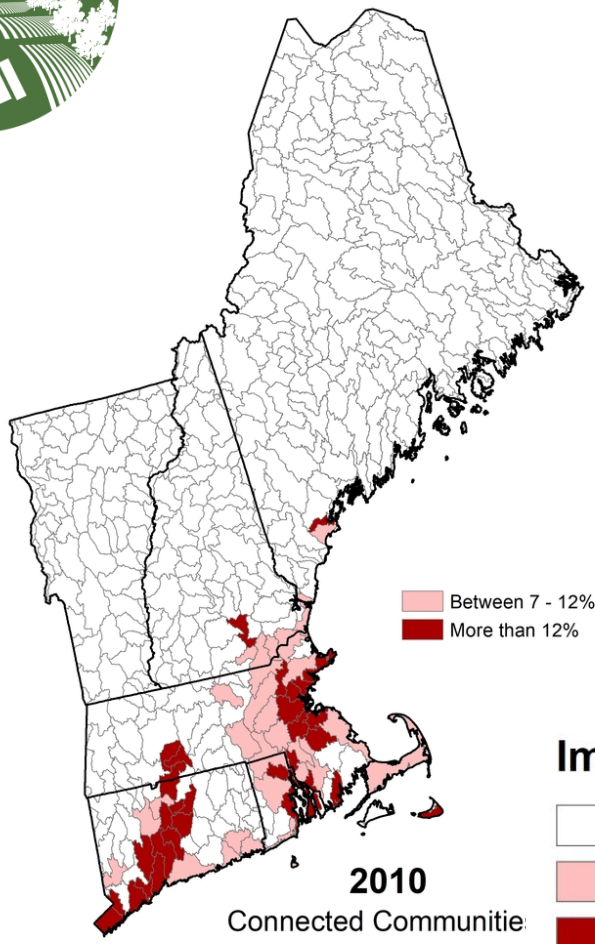
S3RCN

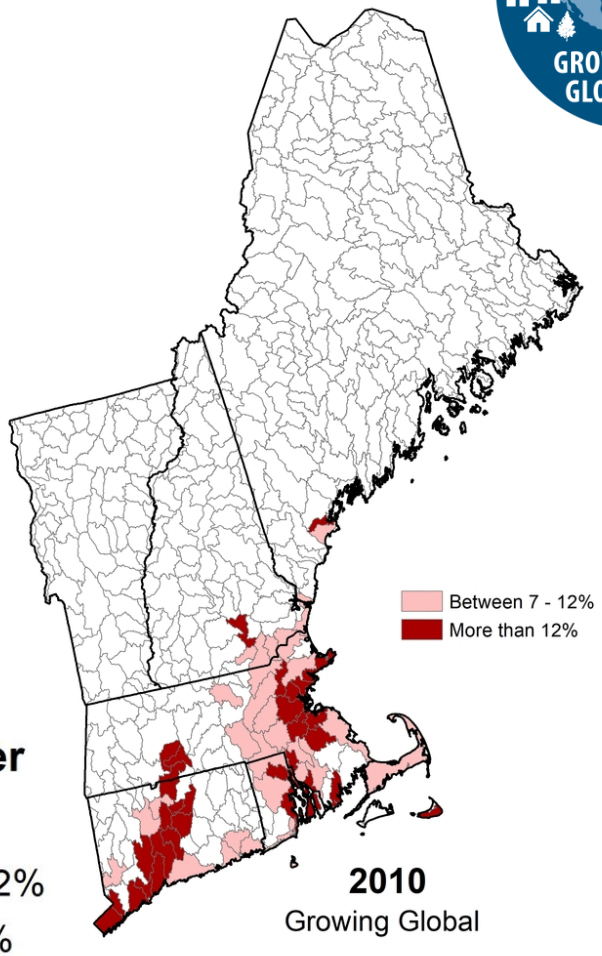
Scenarios, Services & Society
Research Coordination Network

Sprawl


CONNECTED COMMUNITIES
GROWING GLOBAL
Town Type
Developed and Sprawling
Developed and not Sprawling
Non-Urban and Sprawling
Non-Urban and not Sprawling
2010-2020
Connected Communities
2010-2020
Growing Global

Impervious Surfaces





Impervious Cover

- Less than 7%
- Between 7 - 12%
- More than 12%

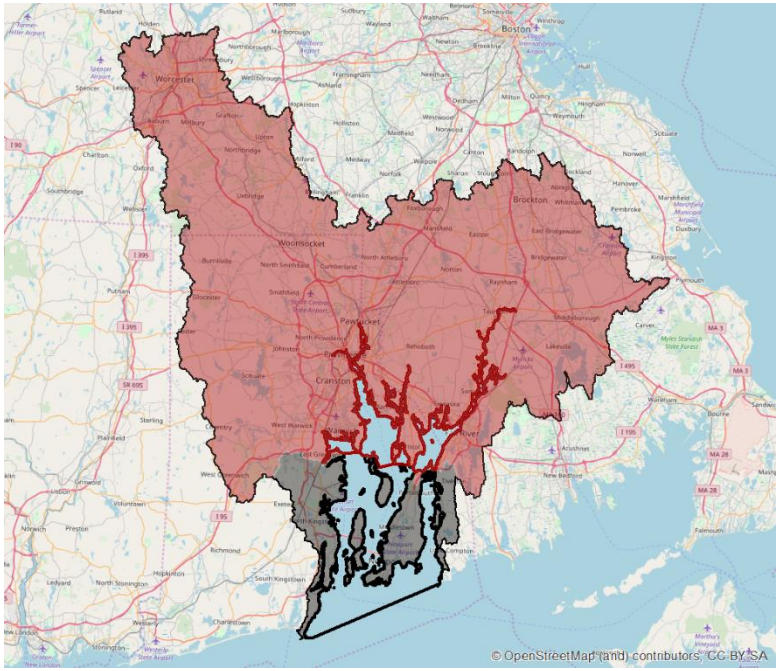
Integrating Ecosystem Services Values in the Narragansett Bay Watershed

Mass Audubon
Shaping the Future of Your Community

THE UNIVERSITY OF RHODE ISLAND
GRADUATE SCHOOL OF OCEANOGRAPHY
CRC COASTAL RESOURCES CENTER

THE UNIVERSITY OF RHODE ISLAND
COLLEGE OF THE ENVIRONMENT AND LIFE SCIENCES

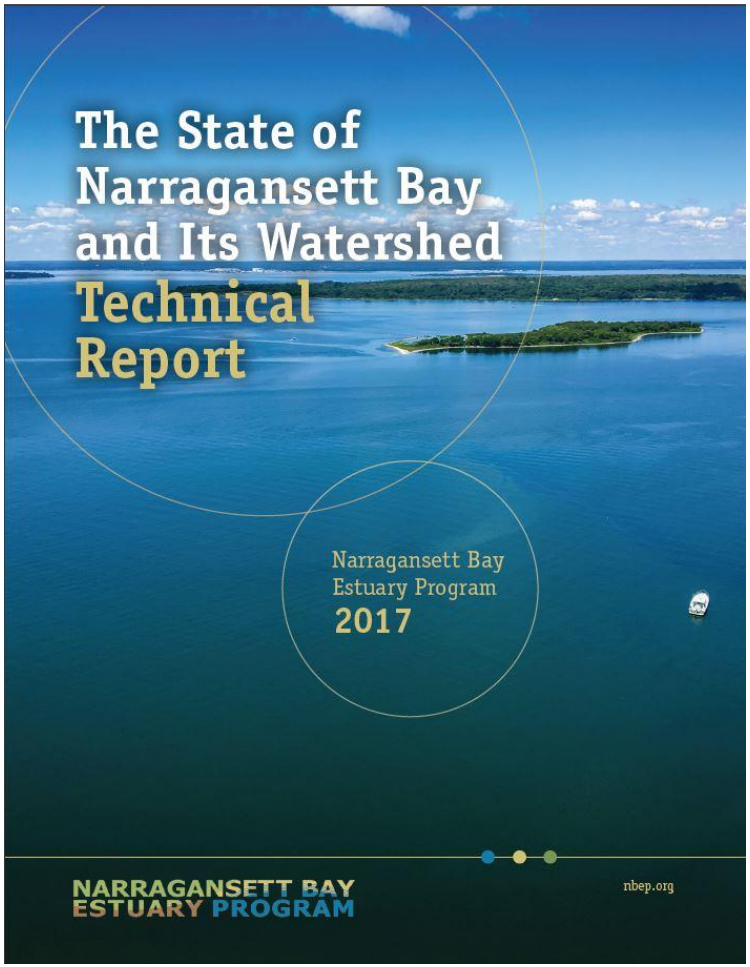
natural capital PROJECT



SNEP
Southeast New England Program

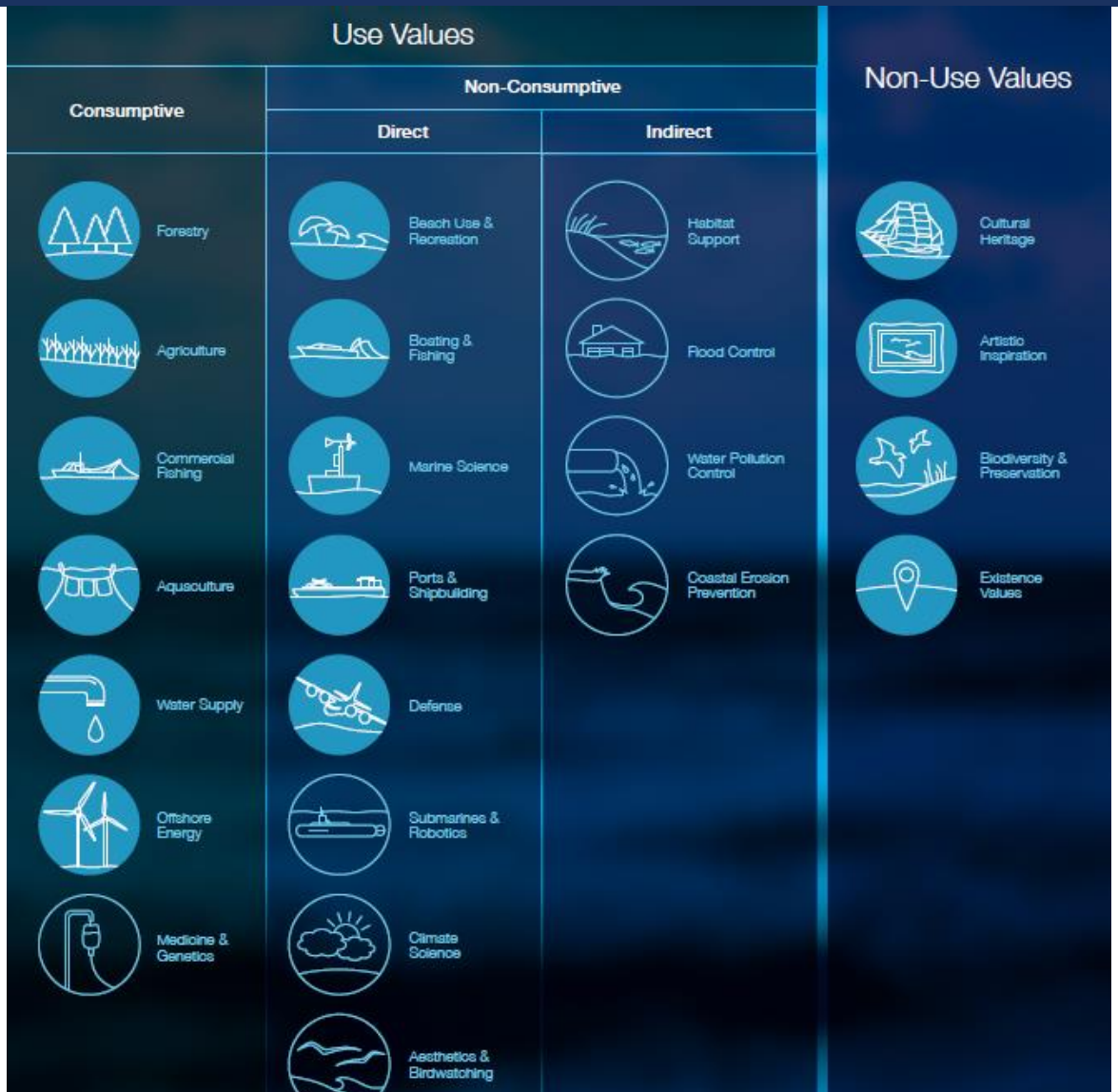
massaudubon.org/naturesvalue

Status and Trends in the Narragansett Bay Watershed – And Possible Futures



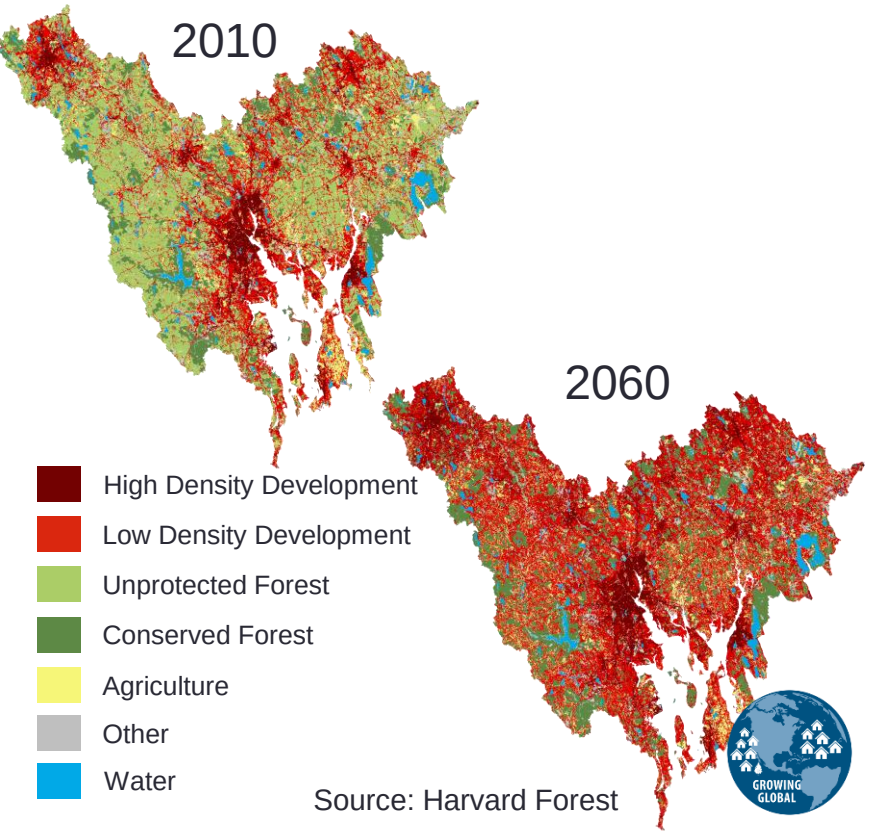
AN ECONOMIC EVALUATION OF THE NARRAGANSETT BAY WATERSHED

EMI UCHIDA, PROFESSOR, DEPT OF ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS
UNIVERSITY OF RHODE ISLAND (euchida@uri.edu)



Harvard Forest

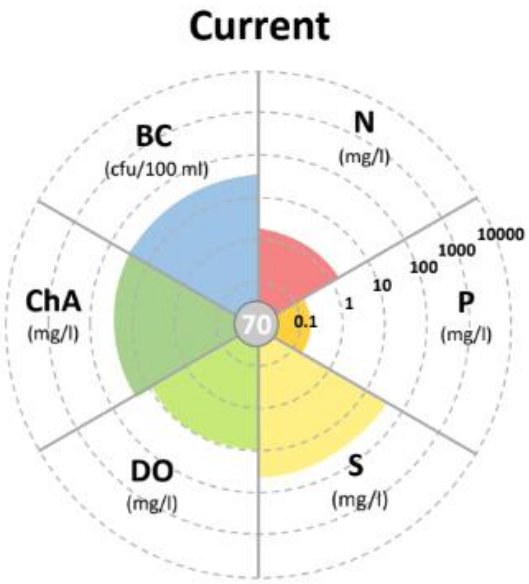
NARRAGANSETT BAY

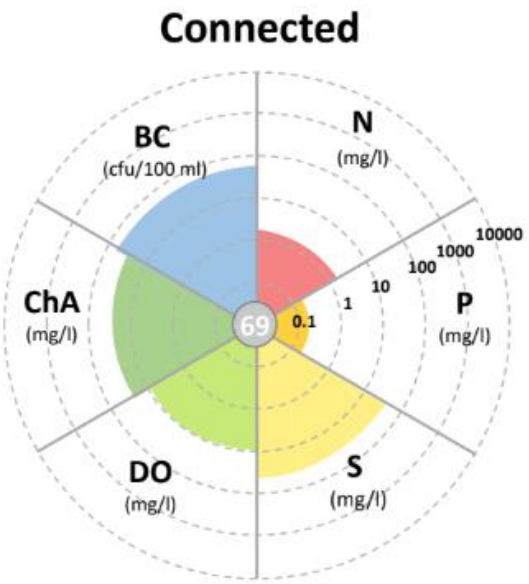


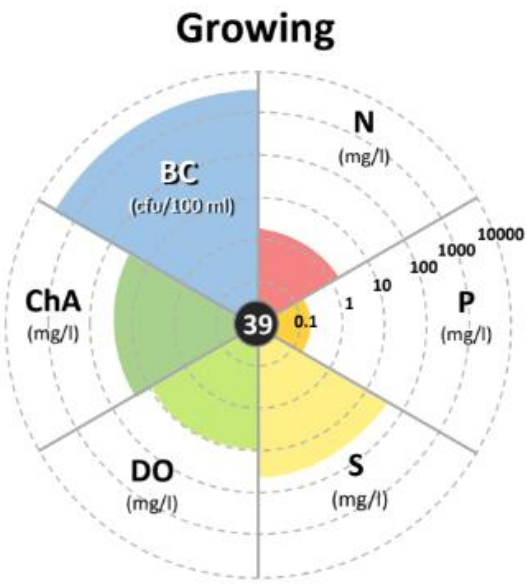
Source: Harvard Forest

2060 scenarios	Urban	Forest	Ag
Connected Communities	34%	46%	8%
Growing Global	57%	22%	9%
Go It Alone	39%	42%	7%
Recent Trends	41%	40%	7%
Yankee Cosmopolitan	50%	32%	6%
Current (2010)	31%	50%	7%

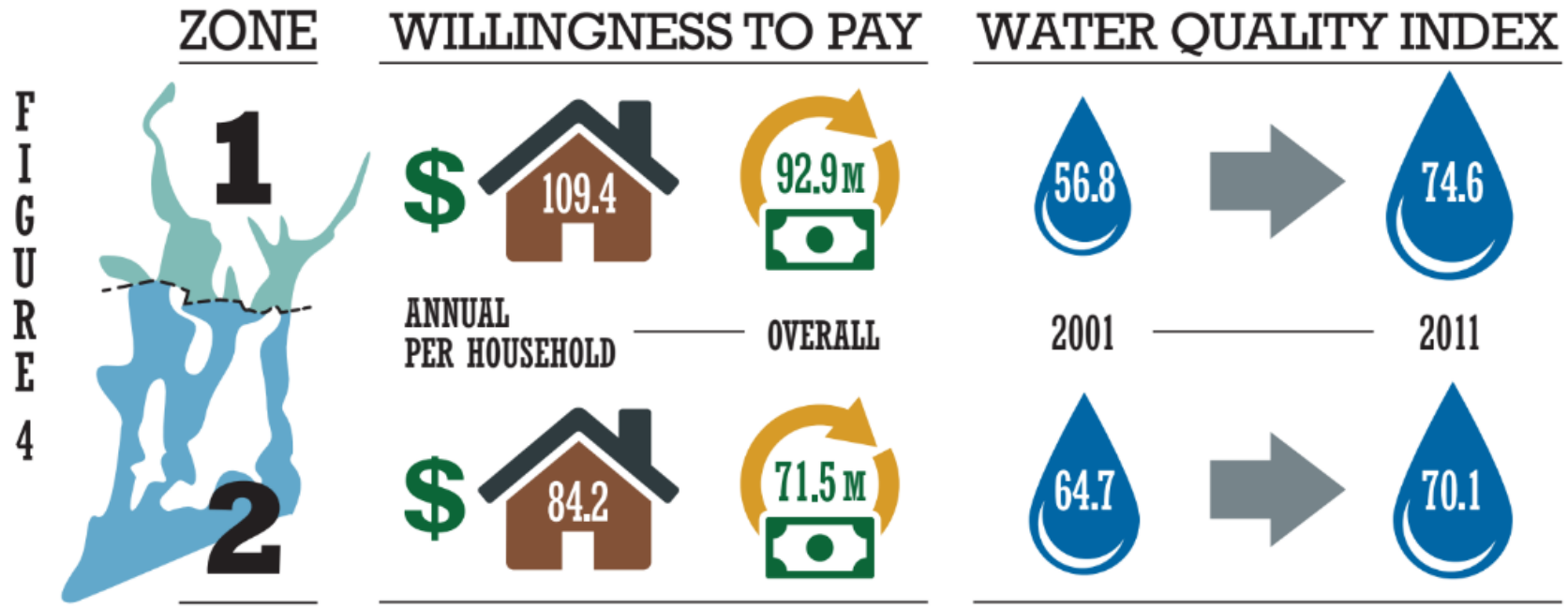
Integrating Ecosystem Services Values in the Narragansett Bay Watershed







Integrating Ecosystem Services Values in the Narragansett Bay Watershed



Resilience: The capacity to absorb disturbance and reorganize while retaining the same basic function, structure and identity.

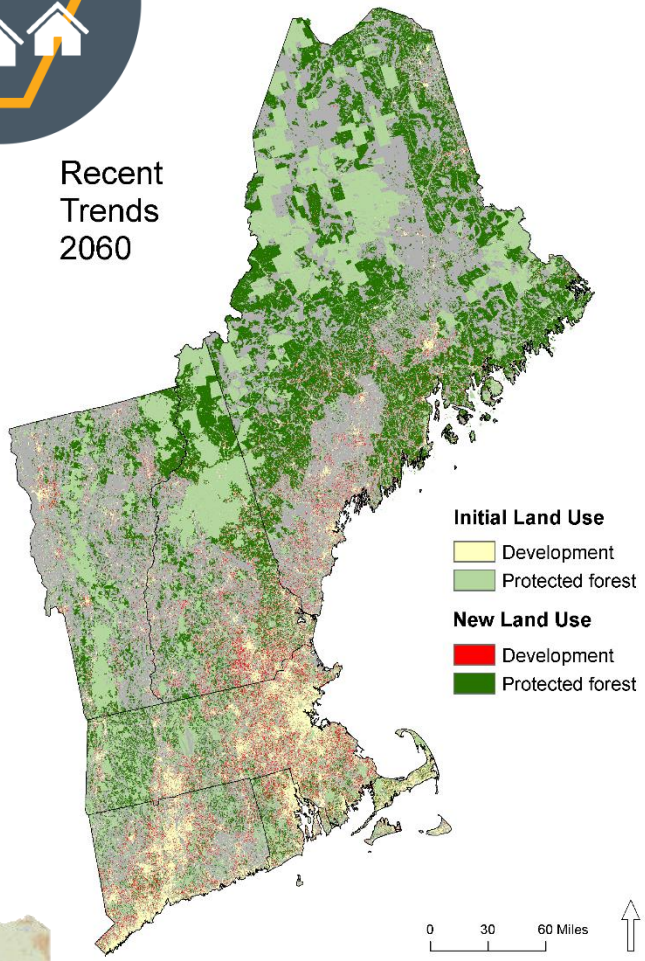
Landscape Complexity

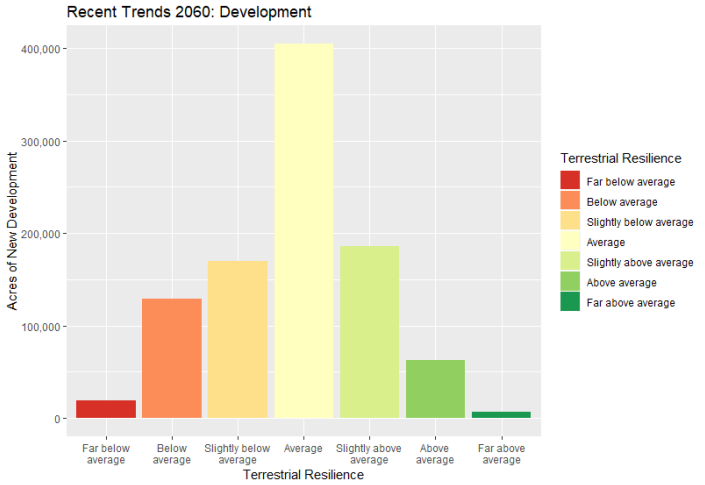
Number of microclimates are found in the area

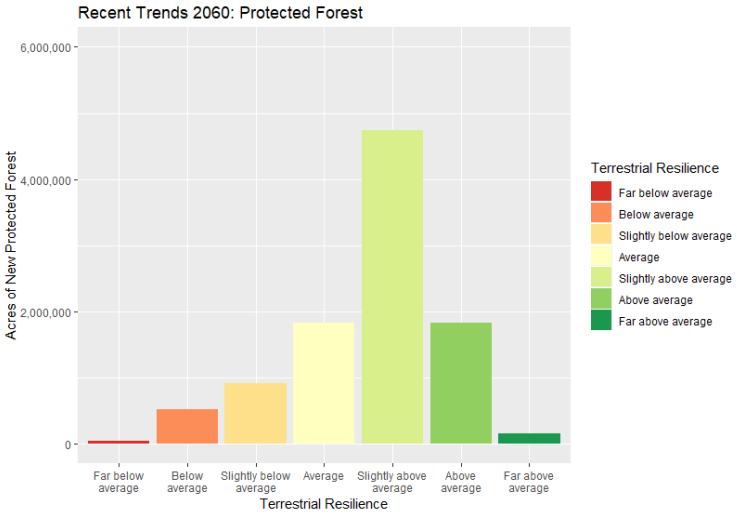
Landscape Connectivity

Possibility for individuals and populations to move among these microclimates

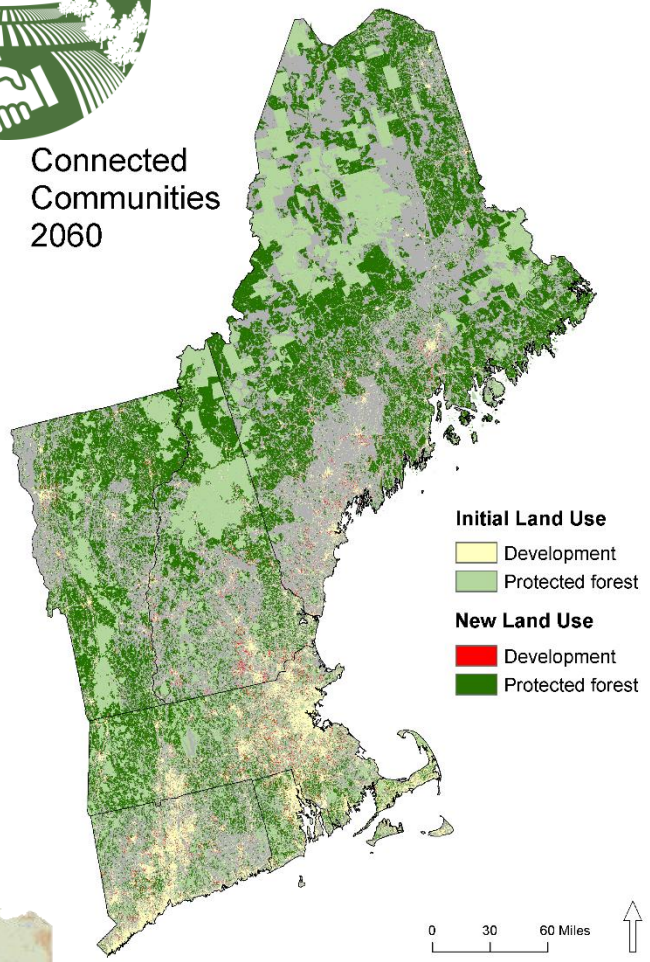
Recent
Trends
2060

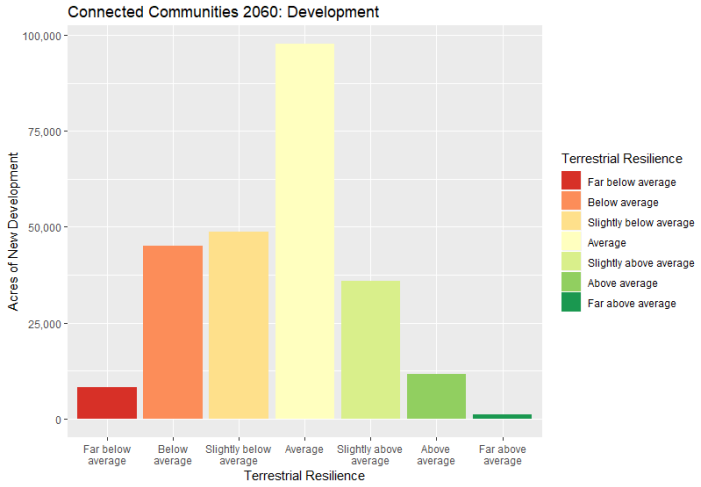


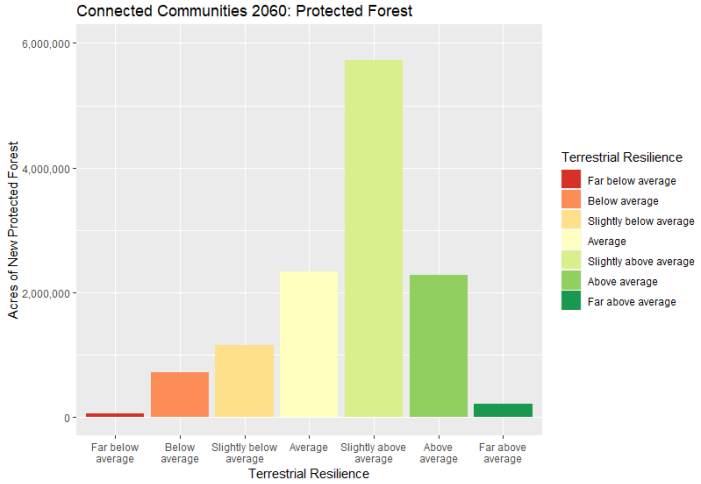




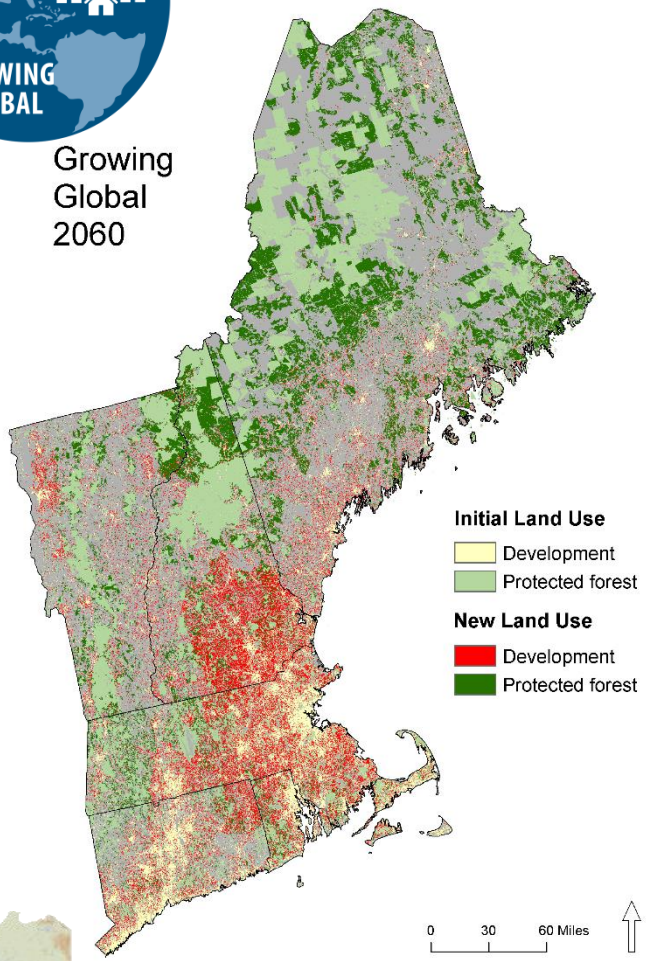
Connected Communities 2060

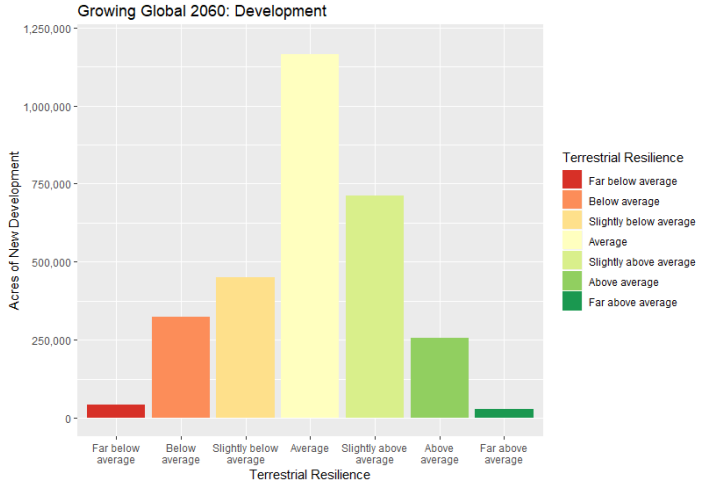


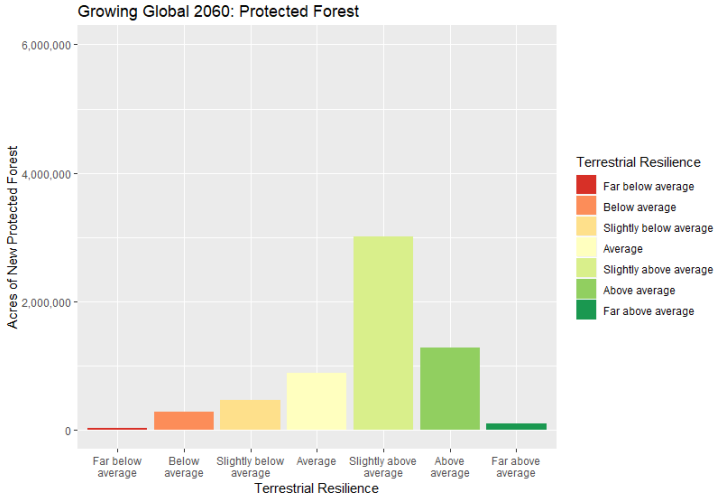




Growing
Global
2060

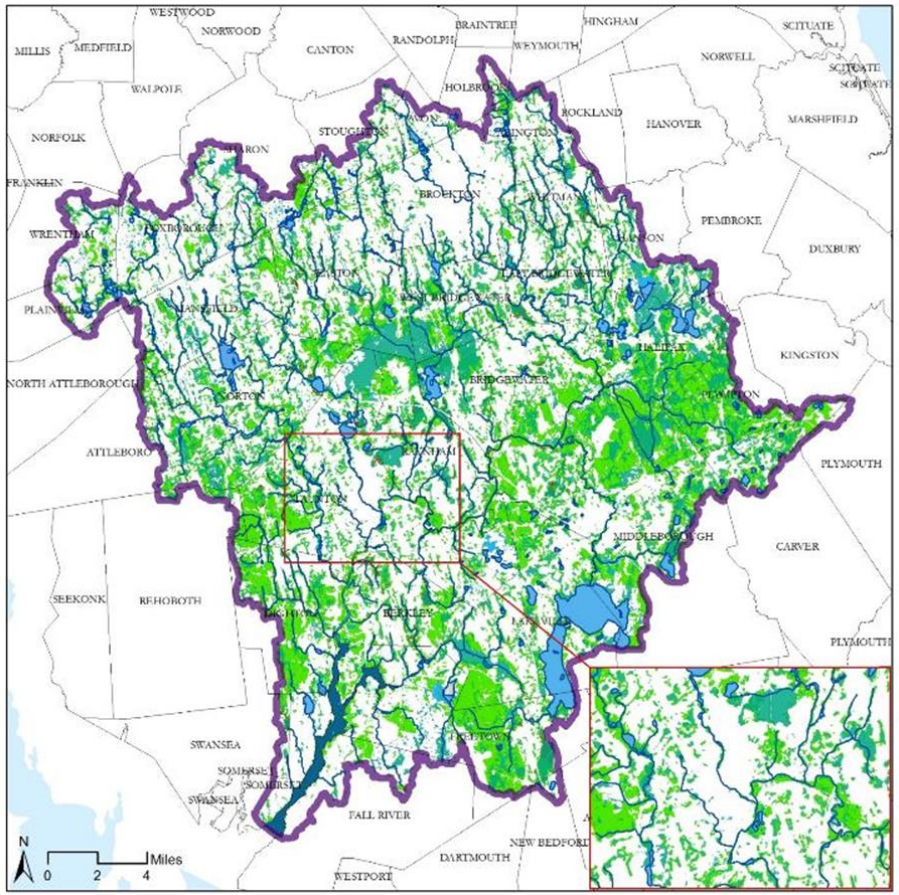




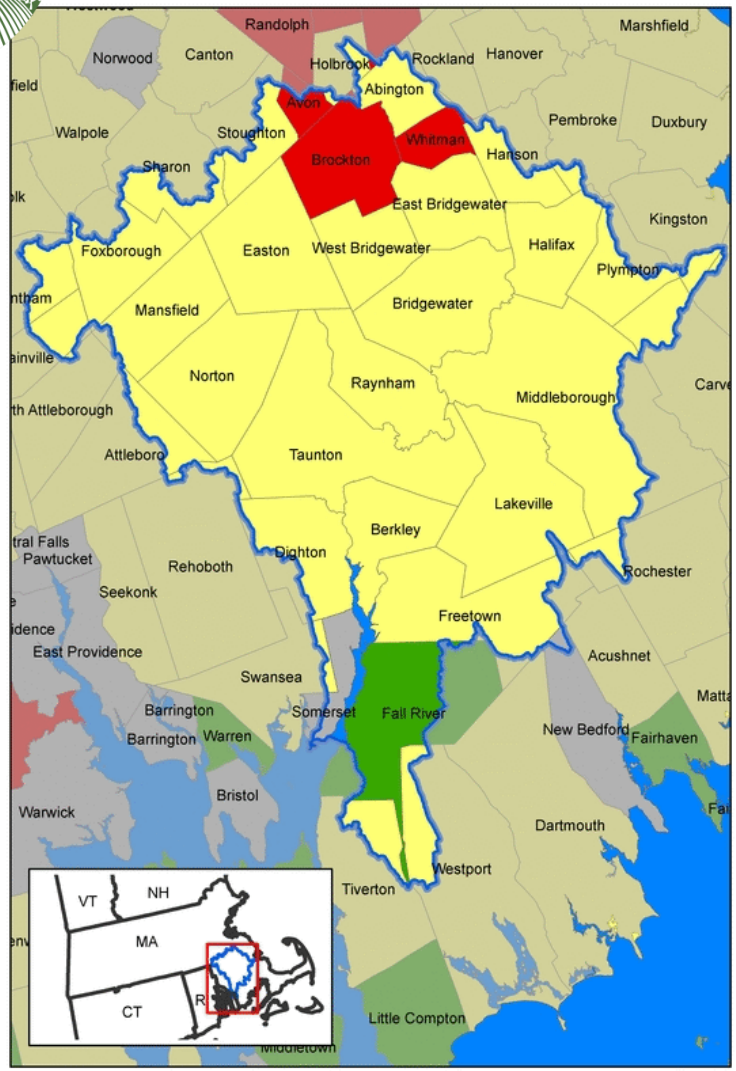


Resilient Taunton Watershed Network (RTWN)

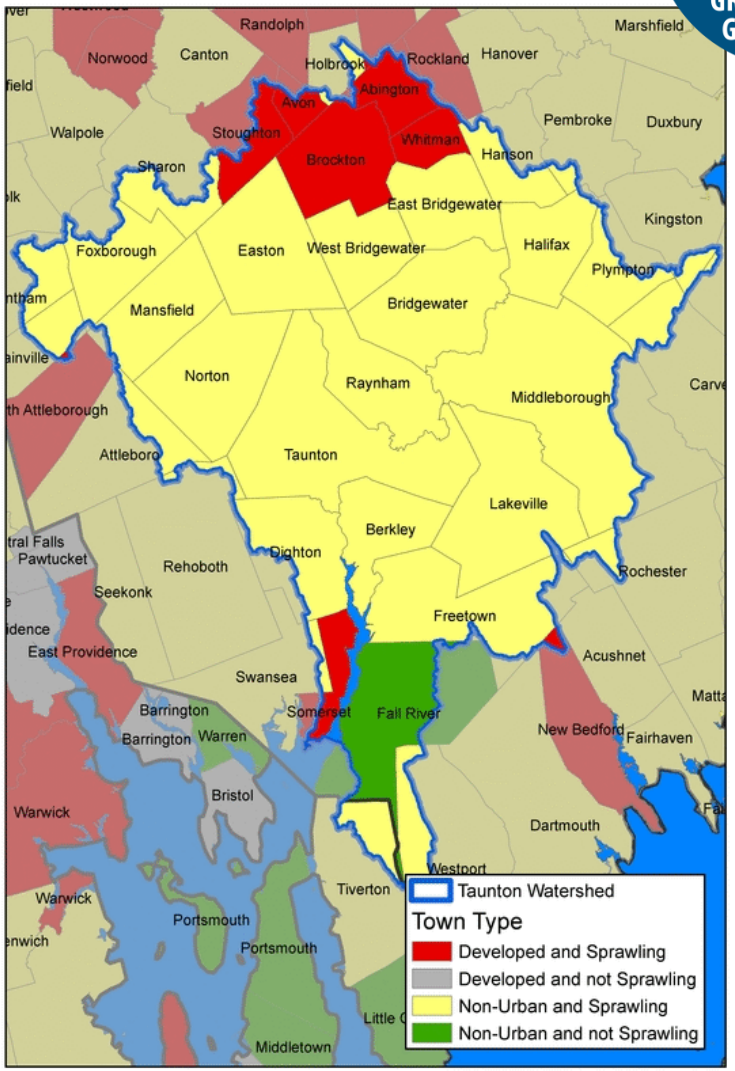
The RTWN was formed in 2014 and is an award-winning collaboration of 19 organizations and agencies who care about the future health and resilience of the Taunton River Watershed and believe that nature-based solutions have economic, social, and ecological benefits.



Sprawl in the Taunton Watershed

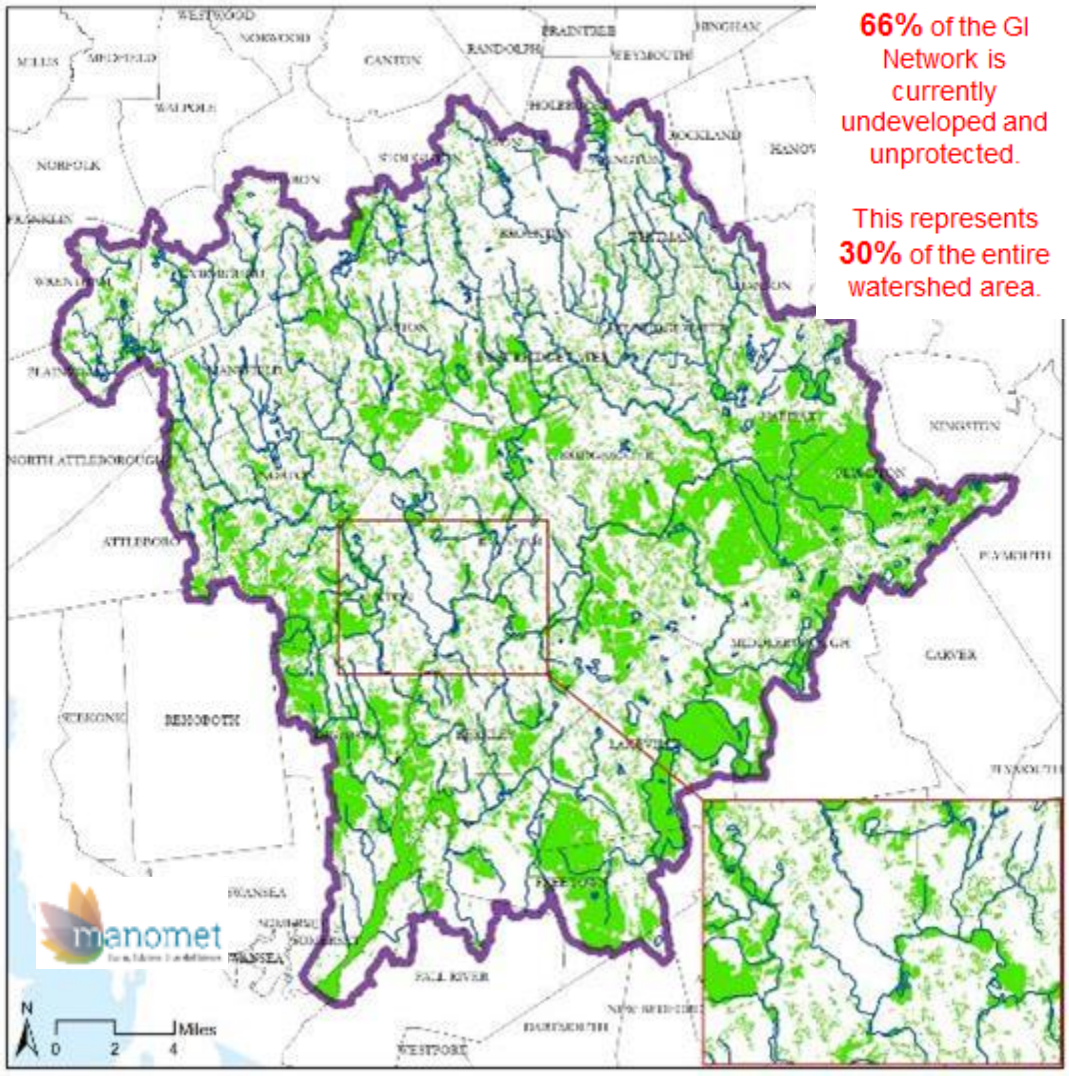


2010-2020
Connected Communities



2010-2020
Growing Global

Taunton Watershed Green Infrastructure Map

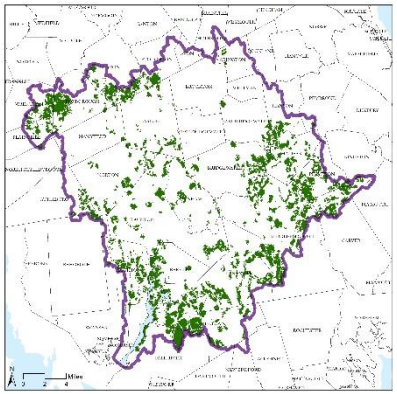


66% of the GI Network is currently undeveloped and unprotected.

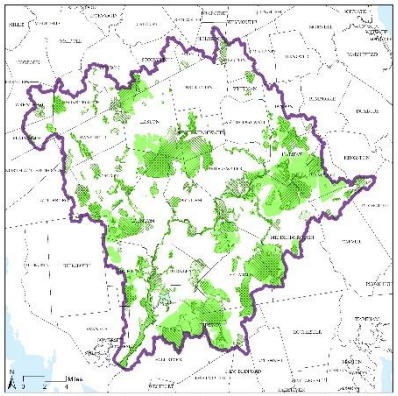
This represents **30%** of the entire watershed area.

Green Infrastructure Network Components…

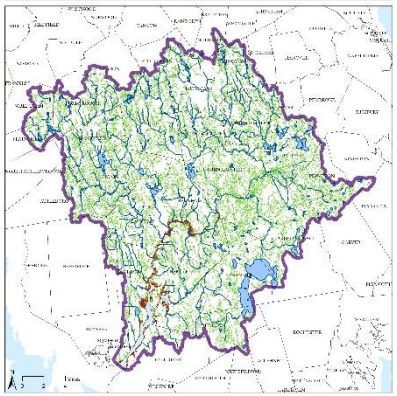
Areas of Above Average Resilience

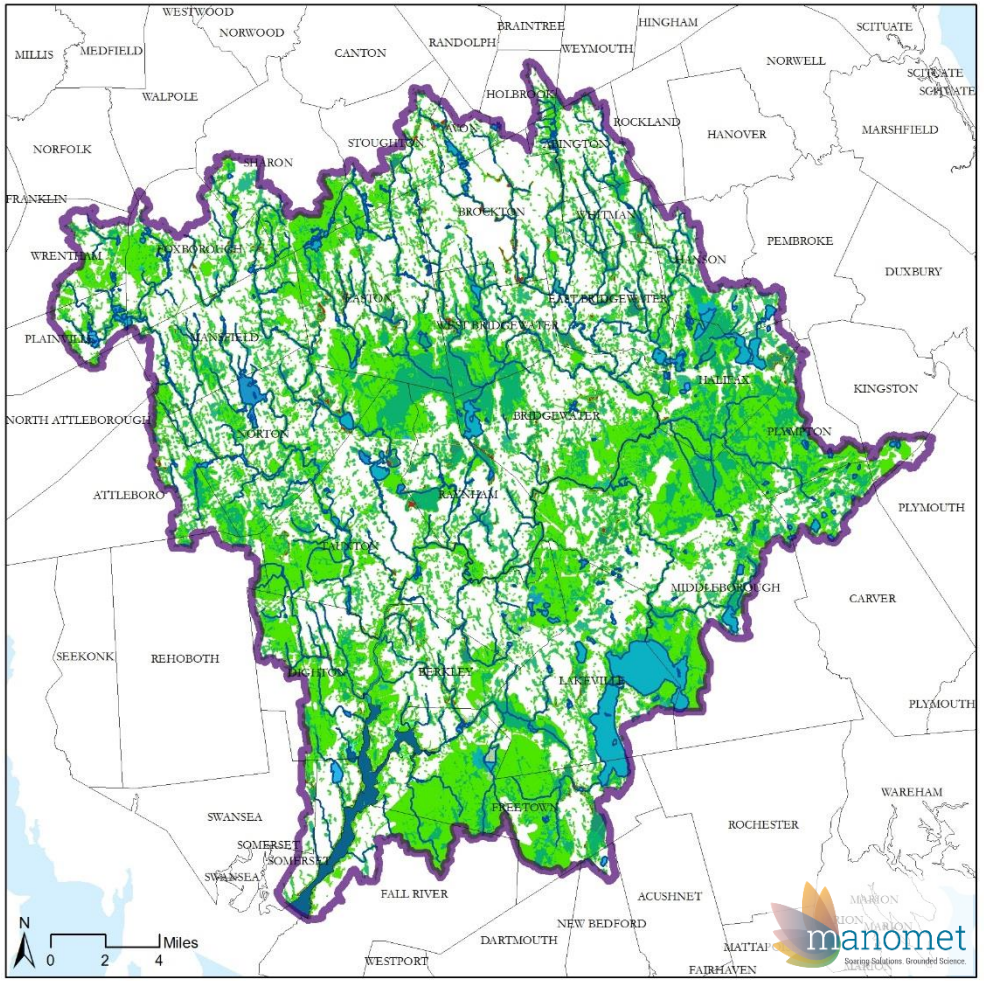


BioMap2 Core & Critical Natural Landscape



Areas within 100ft of Surface Waters, Wetlands, and Flood Zones; Areas </= 4m elevation (vulnerable to sea level rise)





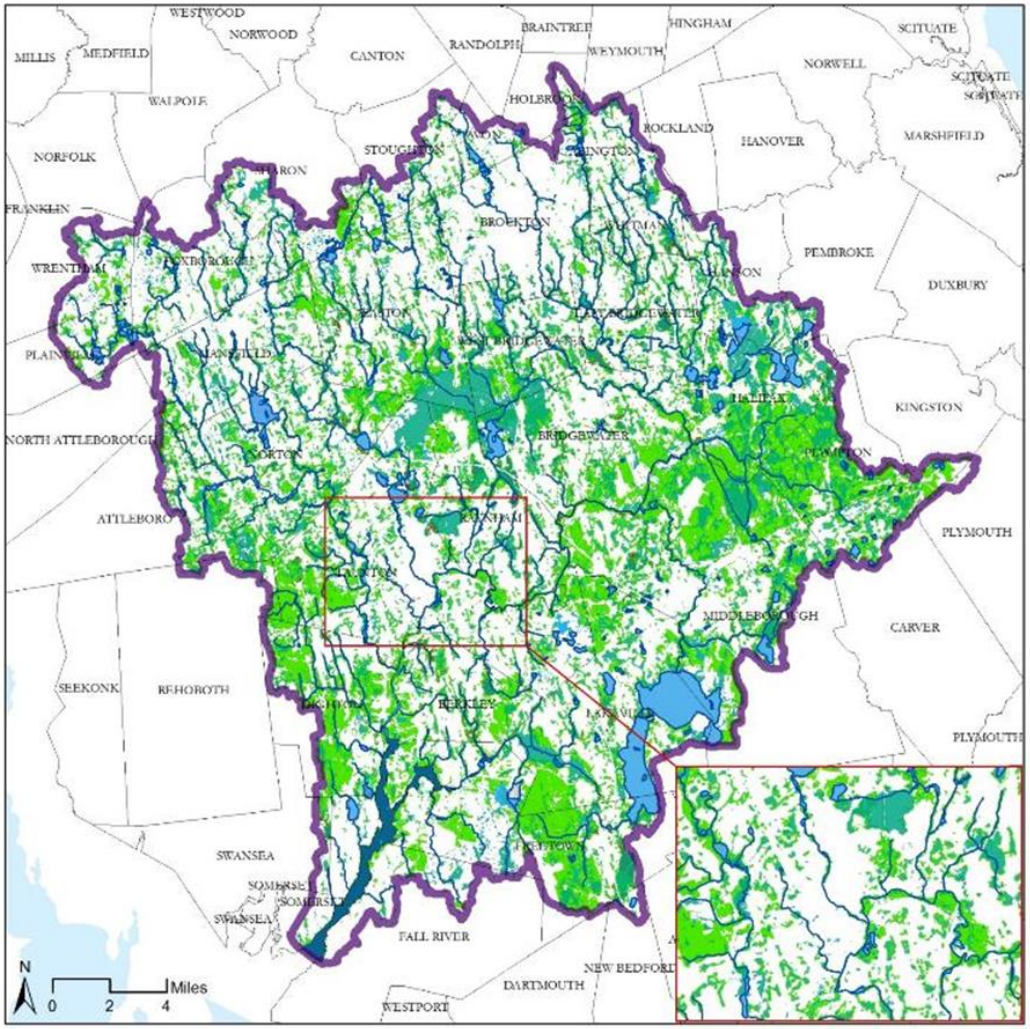
Legend

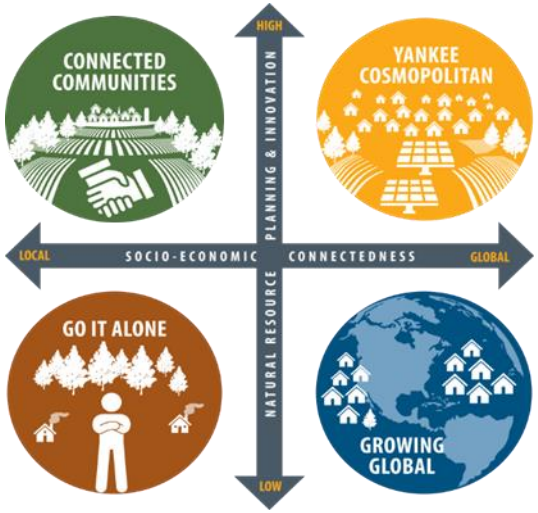
- Green Infrastructure Network
- 100-yr and High Risk Coastal Flood Areas
- Town Boundaries
- Taunton Watershed Boundary
- Major Streams

Surface Waters & Wetlands

- Freshwater Pond, Lake, or Stream
- Freshwater Wetland
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Other

What would happen to the Taunton Watershed Green Infrastructure lands under future scenarios?





Catalyzing Transformative Change: *planning together for resilient communities through nature-based solutions*

SNEP Southeast New England Program

RESTORE AMERICA'S ESTUARIES

1. Document and share the RTWN model of collaborative partnerships and metrics beyond the watershed
2. Offer peer-to-peer training opportunities throughout the region
3. Develop case studies on best practices and projects
4. Provide technical assistance to communities by reviewing bylaws and regulations to encourage nature-based solutions
5. Research and summarize potential restoration projects and assist with funding to implement

SRPEDD

manomet Soaring Solutions. Grounded Science.

The Nature Conservancy

Mass Audubon Shaping the Future of Your Community

Peer-to-peer training & sharing best practices between states

Municipal Vulnerability Preparedness (MVP)

State and local partnership to build resiliency to climate change

1. Engage Community
2. Identify CC impacts and hazards
3. Complete assessment of vulnerabilities & strengths
4. Develop and prioritize actions
5. Take Action

Review bylaws and regulations to encourage nature-based solutions

Factors	Conventional	Better	Best	Community's Zoning	Community's Subdivision Rules & Regulations	Community's Site Plan Review	Community's Stormwater/LID Bylaw/Regulations
GOAL 1: PROTECT NATURAL RESOURCES AND OPEN SPACE							
Soils managed for revegetation	Not addressed	Limitations on removal from site, and/or requirements for stabilization and revegetation	Prohibit removal of topsoil from site. Require rototilling and other prep of soils compacted during construction	*(Not applicable)*			
Limit clearing, lawn size, require retention or planting of native vegetation/naturalized areas	Not addressed or general qualitative statement not tied to other design standards	Encourage minimization of clearing/ grubbing	Require minimization of clearing/grubbing with specific standards				
Require native vegetation and trees	Require or recommend invasives	Not addressed, or mixture of required plantings of native and nonnative	Require at least 75% native plantings				
GOAL 2: PROMOTE EFFICIENT, COMPACT DEVELOPMENT PATTERNS AND INFILL							
Lot size	Required minimum lot sizes	OSRD/NRPZ preferred. Special permit with incentives to utilize	Flexible with OSRD/NRPZ by right, preferred option				

How does the RTWN model work?

(this is our most commonly received question)

- **Step 1**: Get together a great group of people
- **Step 2**: Determine what your region needs most
- **Step 3**: Share the load - Figure out what everyone's good at and has resources
- **Step 4**: Create goals
- **Step 5**: Work together and move the needle!

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Mass Audubon

Shaping the Future of Your Community