

Needham Natural Hazards and Climate Planning



Natural Hazards and Climate Planning Public Presentation Town of Needham

Welcome

Hazard Mitigation Plan and
Climate Plan Overview

Climate Change Observations
and Projections

Natural Hazards and Climate
Impacts for Needham

Needham Climate Priorities

Feedback: Share your questions,
observations, and priorities

Project Team

Rebecca Ping	Emergency Management, Project Coordinator
Debbie Anderson	Conservation
Nicholas Ceurvels	Fire
Steve Cusick	Water Treatment Plant
Tony Del Gaizo	Town Engineer
Barry Dulong	Building Maintenance
Sean Harrington	Water and Sewer
Rhain Hayland	Highway Division
Carys Lustig	Finance and Administration
John McGrath	Police
Richard Merson	Public Works
Jessica Moss	Council on Aging
Dave Roche	Building
Eleanor Rosellini	Green Needham Collaborative
Tiffany Zike	Public Health

Hazard Mitigation Plan

Federal program
FEMA

Addresses all natural hazards

- Flooding
- Extreme heat and cold
- Drought
- Landslide
- Wildfires
- Hurricanes
- Tornadoes
- Winter Storms
- Wind
- Invasives
- Earthquakes

Municipal Vulnerability Preparedness

State program, Executive Office of Energy
and Environmental Affairs

Addresses all climate hazards

- Environment
- Infrastructure
- Society

Hazard Mitigation Plans

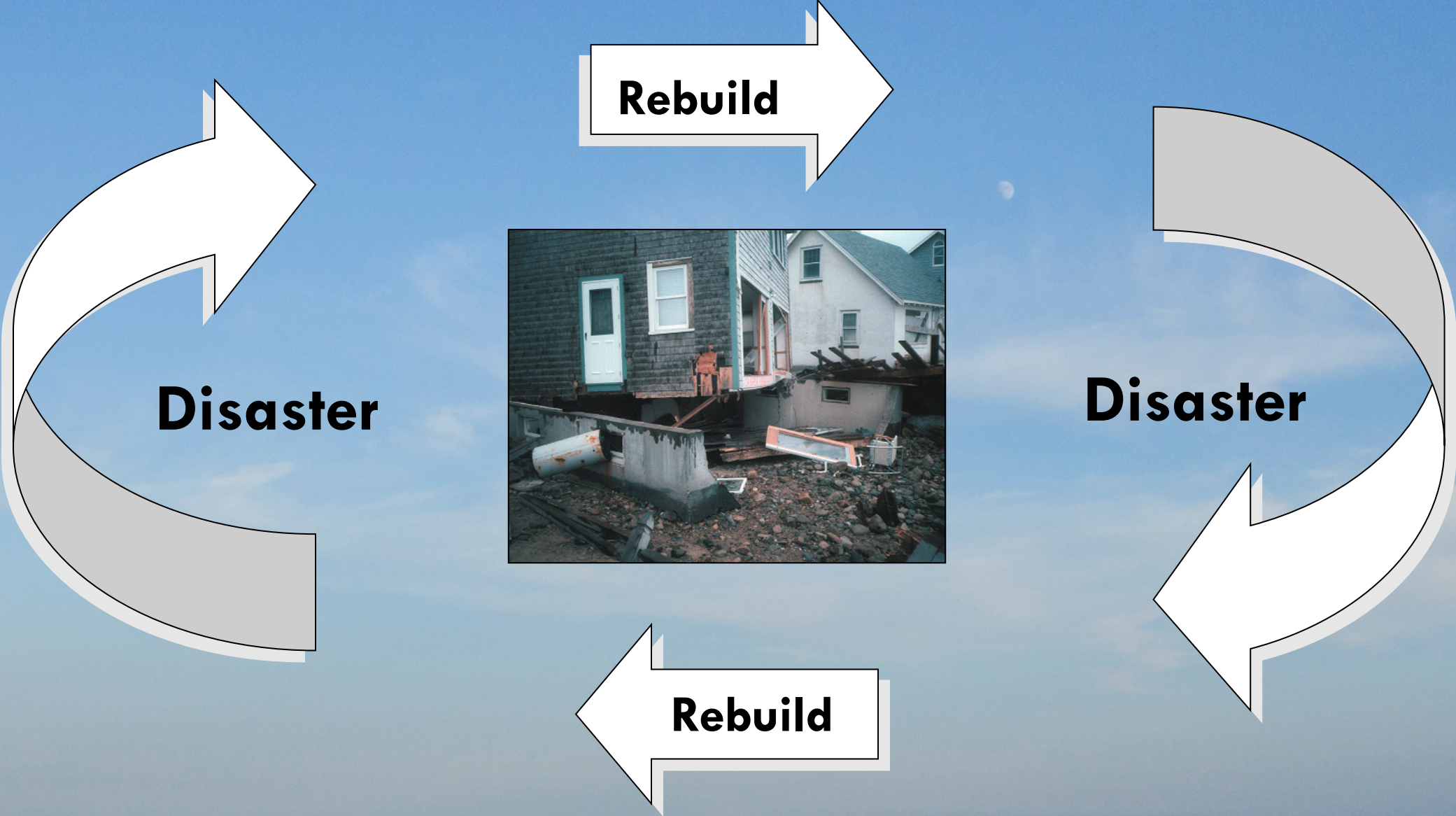
- The **Federal Disaster Mitigation Act of 2000** requires towns to adopt a Hazard Mitigation Plan to be eligible for FEMA mitigation grants.
- Needham's first plan has expired and now must be updated
- This Plan will meet FEMA's requirements and make the Town eligible for FEMA mitigation project grants



Hurricane Irene

Source: Needham Patch

Breaking the Cycle of Disaster & Rebuilding



Plan Development Steps

**7. Plan Approval
and Adoption**

**6. Recommend Mitigation
Strategies**

**5. Public Meetings
Stakeholders**

**4. Review Existing
Mitigation**



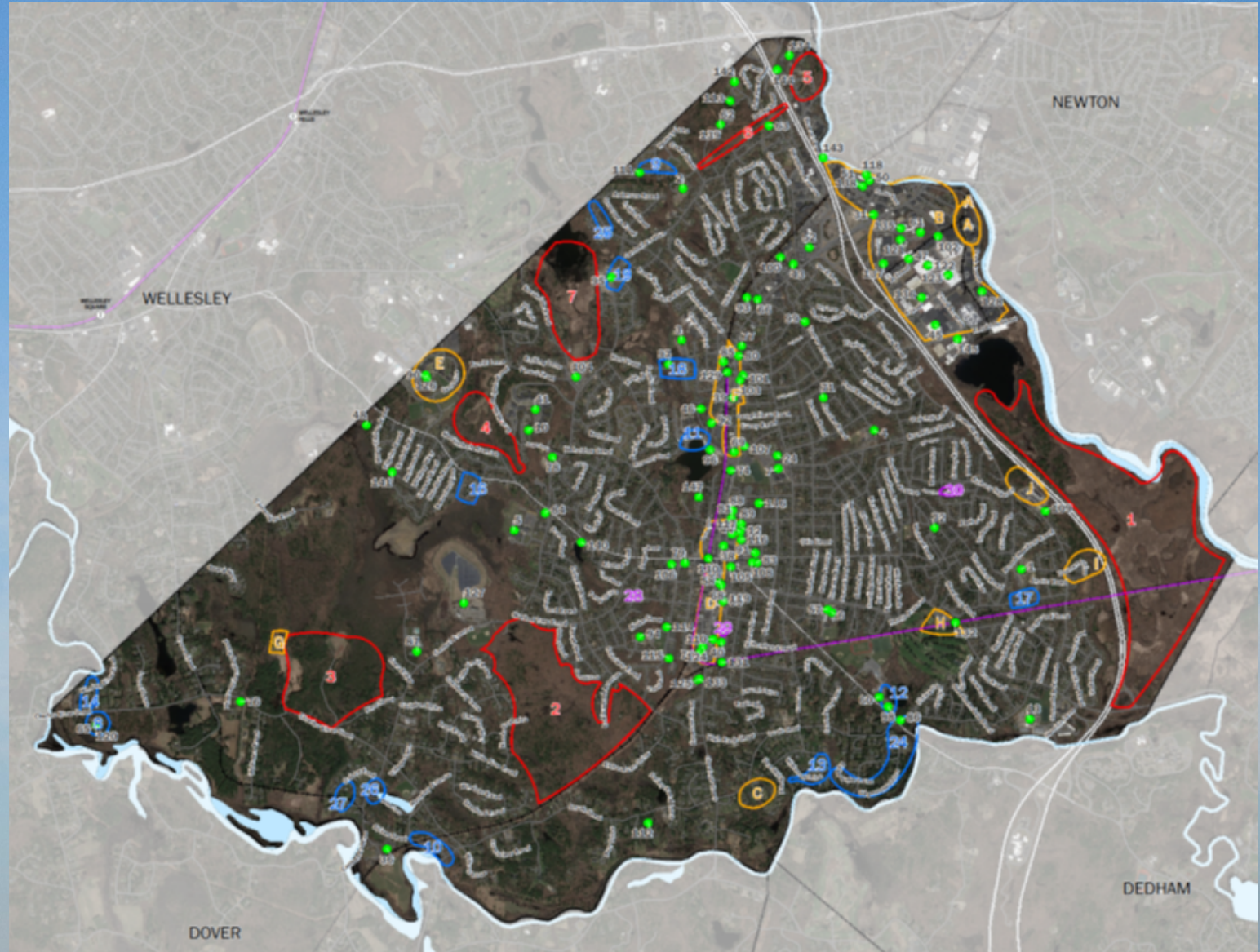
**1. Hazard Identification
& Mapping**

**2. Inventory & Map
Critical Facilities**

**3. Assessment of Risks
& Vulnerabilities**

Hazard Identification & Mapping

- Critical Infrastructure
- Flood Zones
- Historic Flooding
- Fire Risk
- Future Development



Existing Mitigation Measures

MULTI-HAZARDS

- Comprehensive Emergency Mgt. Plan (CEMP)
- Local Emergency Planning Comm. (LEPC)
- Multi-department review of developments
- Massachusetts State Building Code
- CERT
- Heat shelter
- Reverse 911

FLOOD HAZARDS

- National Flood Insurance Program (NFIP)
- Street sweeping and catch basin maintenance
- Aquifer Protection Overlay
- Stormwater and Wetlands regulations
- Land preservation
- Open Space Residential Development

WIND HAZARDS

- DPW tree maintenance program
- Underground utilities in new developments

WINTER STORM HAZARDS

- Overnight parking ban
- Sand/restricted salt application
- Snow storage space
- Snow and Ice Removal bylaw
- Public outreach and education

BRUSH FIRE HAZARDS

- Permits for outdoor burning
- Fire Department development review
- Public education
- Trained for open space protection

DAM HAZARDS

- DCR Dam Safety regulations
- Permits required for construction

GEOLOGIC HAZARDS

- Water system isolation capacity
- Shelters and evacuation plan

Remaining steps for Hazard Mitigation Plan

- **Develop new mitigation strategies for this Plan Update**
- **Final Public Meeting to review the Draft Plan**
- **Review by MEMA and FEMA, revisions if needed**
- **Select Board vote to adopt the plan**
- **Approved plan will be in effect for 5 years**
- **The Town will be eligible for FEMA mitigation grants**

Municipal Vulnerability Preparedness Program



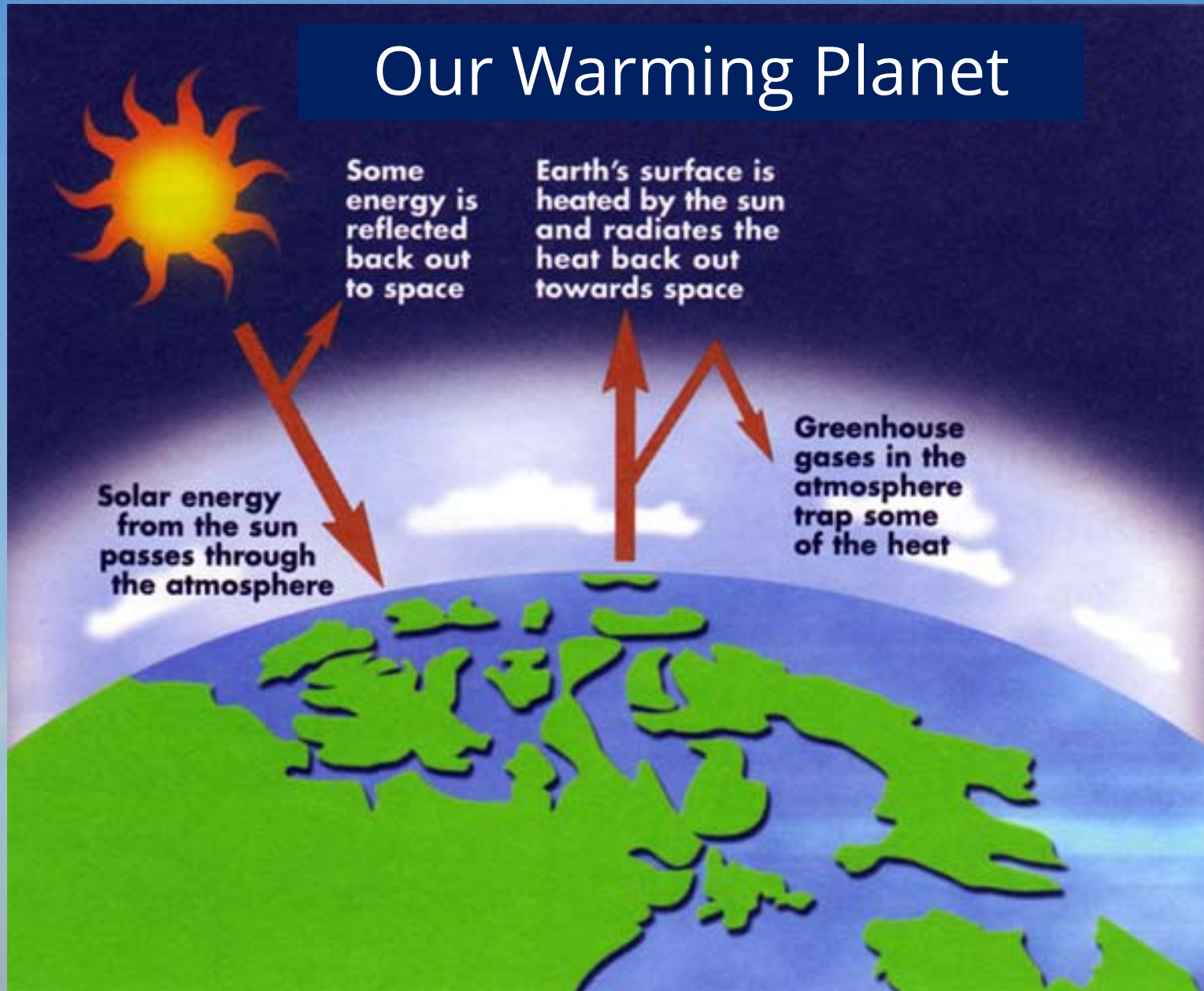
Needham MVP Workshop

Workshop Objectives

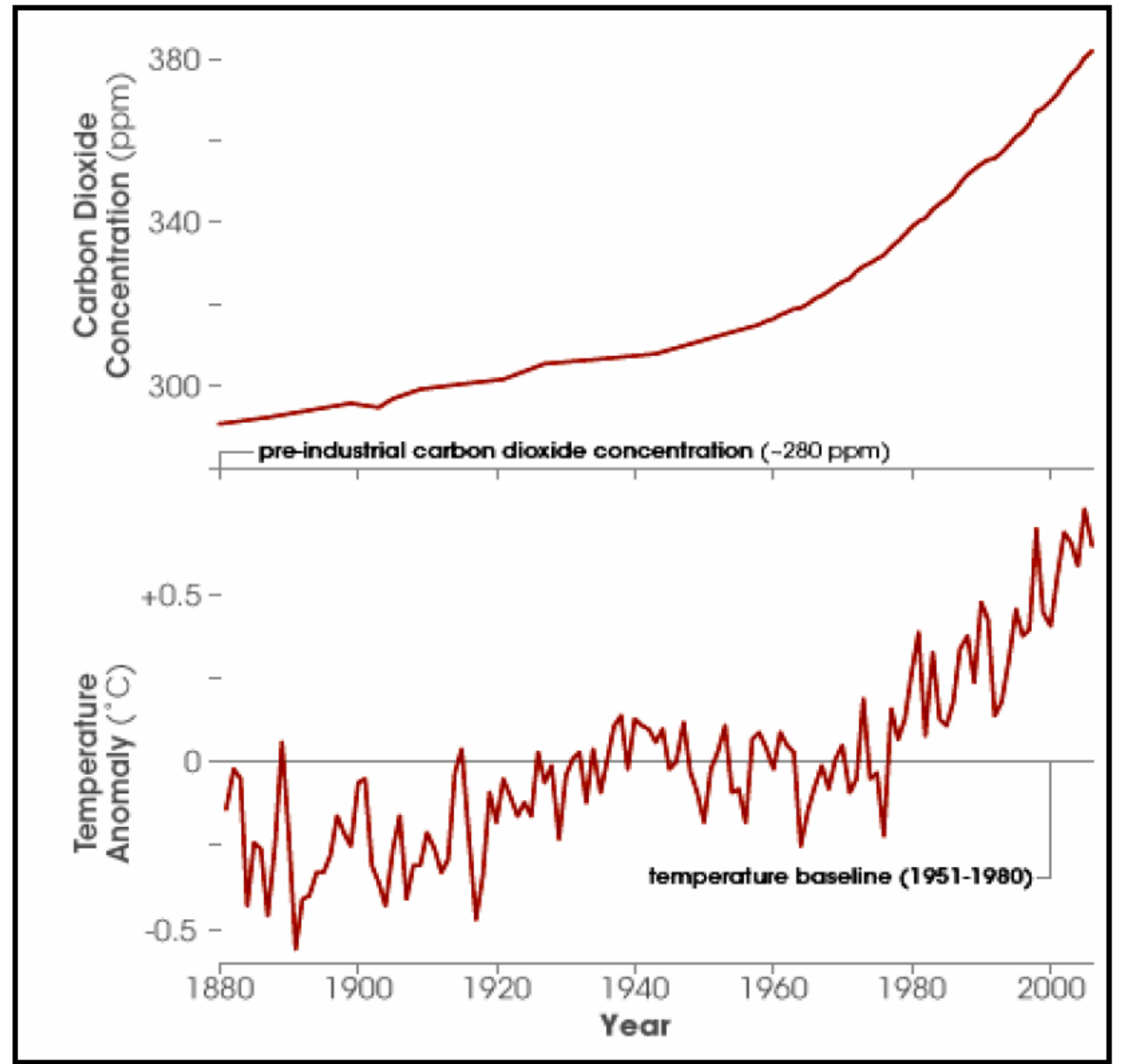
- Understand extreme weather and climate related hazards
- Identify existing and future strengths and vulnerabilities
- Develop and prioritize opportunities to take action to reduce risk and build resilience



Our Warming Planet

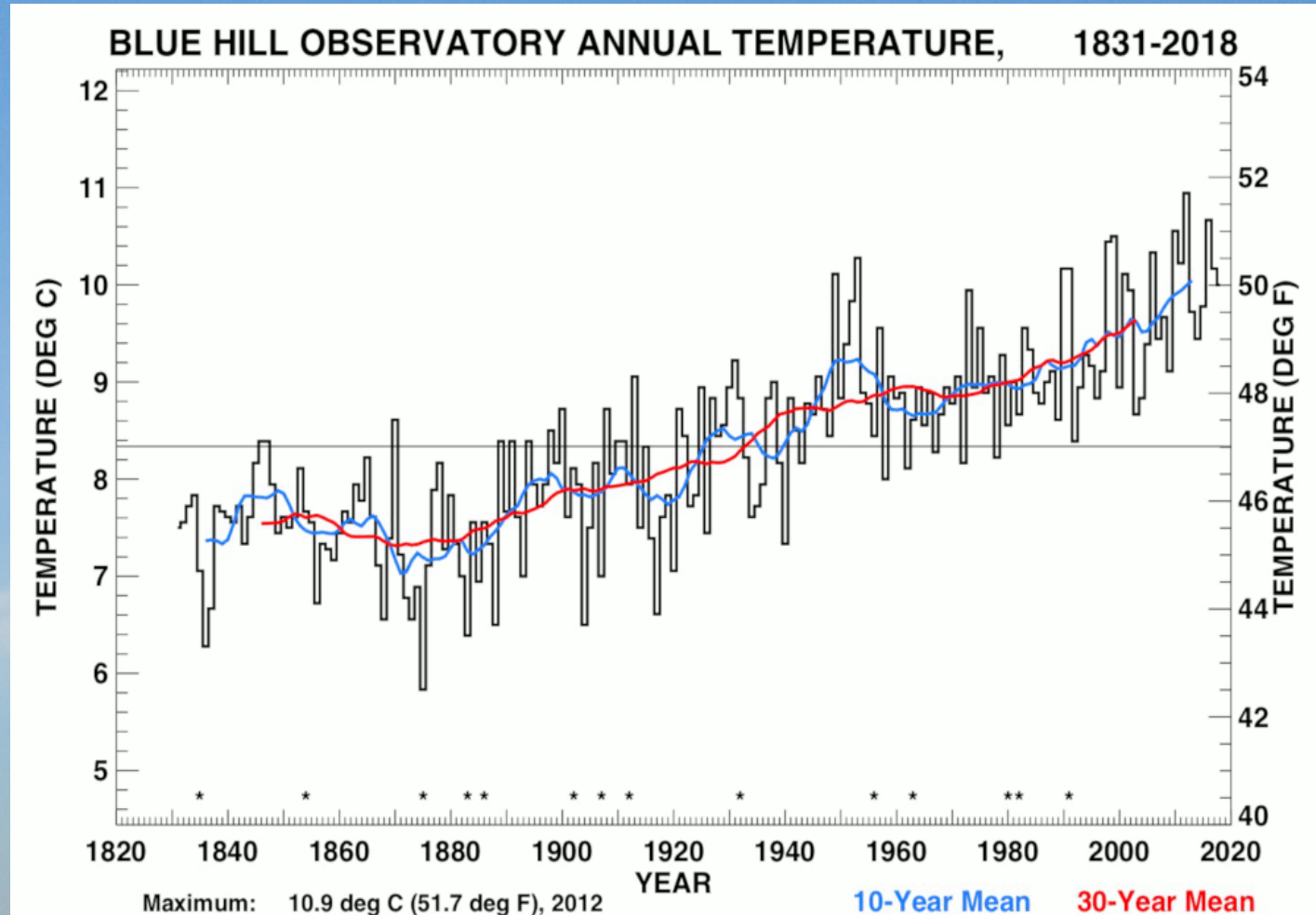


Global Temperature and CO₂ Trends



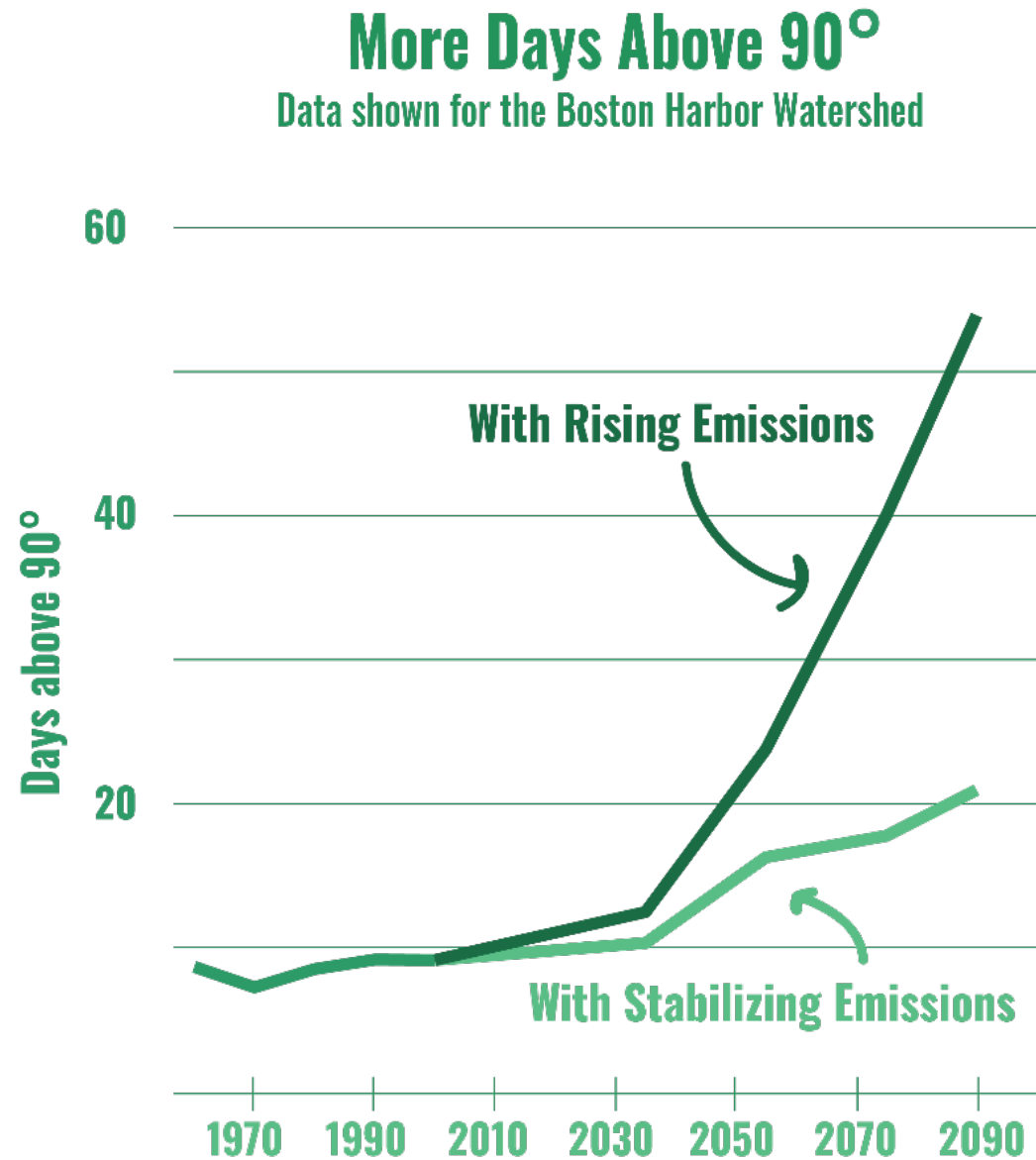
Temperature change: observed

Nearly 3° F since 1831



Blue Hill Observatory Annual Temperature, 1831-2018

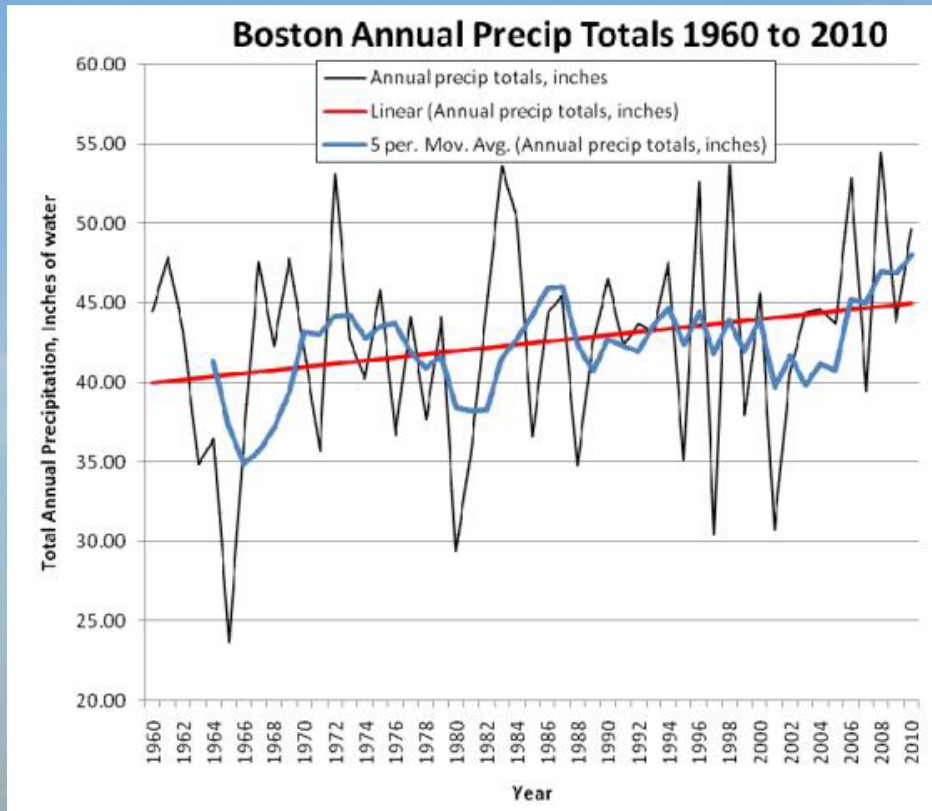
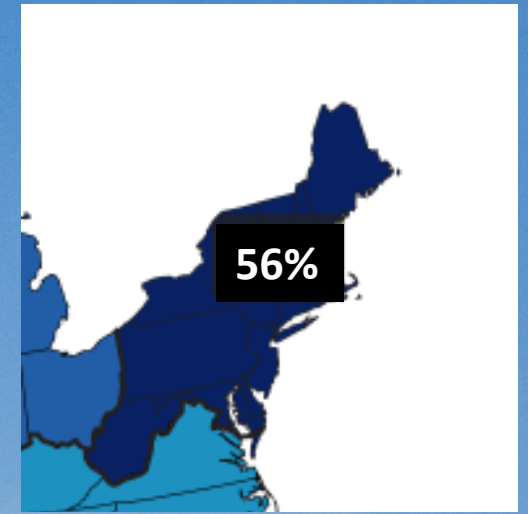
Temperature
change:
projected



Precipitation change: observed

For the Northeast United States: 56% increase in the amount of rain that falls in the top 1% events from 1958 – 2016.

Source: US National Climate Assessment 2018



Source: MA Climate Change Adaptation Report 2011

For Boston area: 10% increase over the past 50 years

Precipitation change: projected Rain and Drought

Expected size of a 10-year, 24-hour storm

4.5 inches

1961 Observed
Rainfall
(NOAA) for
Eastern MA

5.2 inches

2014 Observed
Rainfall
(NOAA) for
Needham

5.6 inches

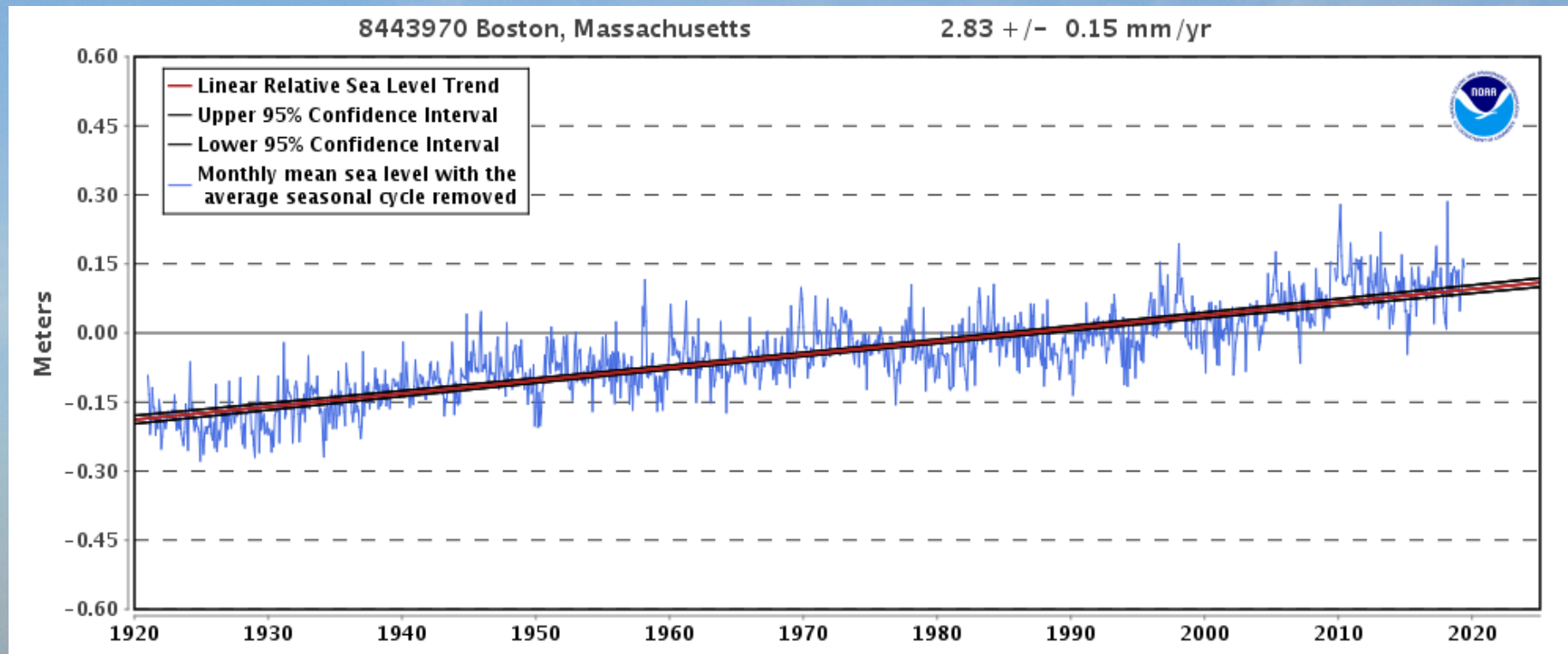
Cambridge
Rainfall
Projections,
2015 - 2044

6.4 inches

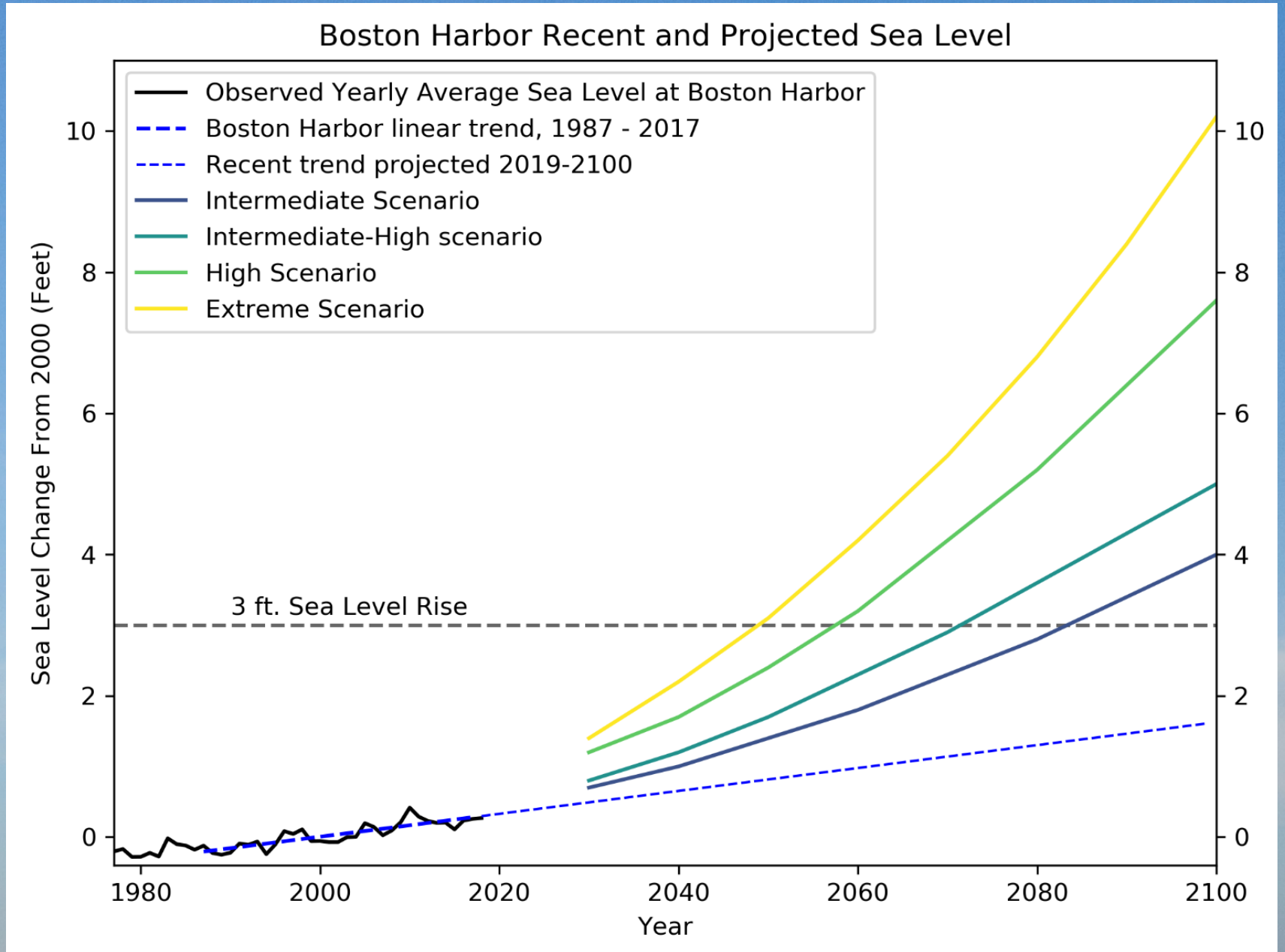
Cambridge
Rainfall
Projections,
2055 - 2084

Sea level rise: observed

- Boston tide station
- Record from 1921-2018
- Equivalent to 11 inches in 100 years



Sea level rise: Projected to 2100 for Boston Harbor



Source: Northeast Climate Adaptation Science Center and
MAPC

Critical Facilities

- Critical Facilities

Other Features

- Rivers and Streams
- Water Bodies

March 2010 Claims

- Flood Insurance
- Disaster Assistance

Hazards

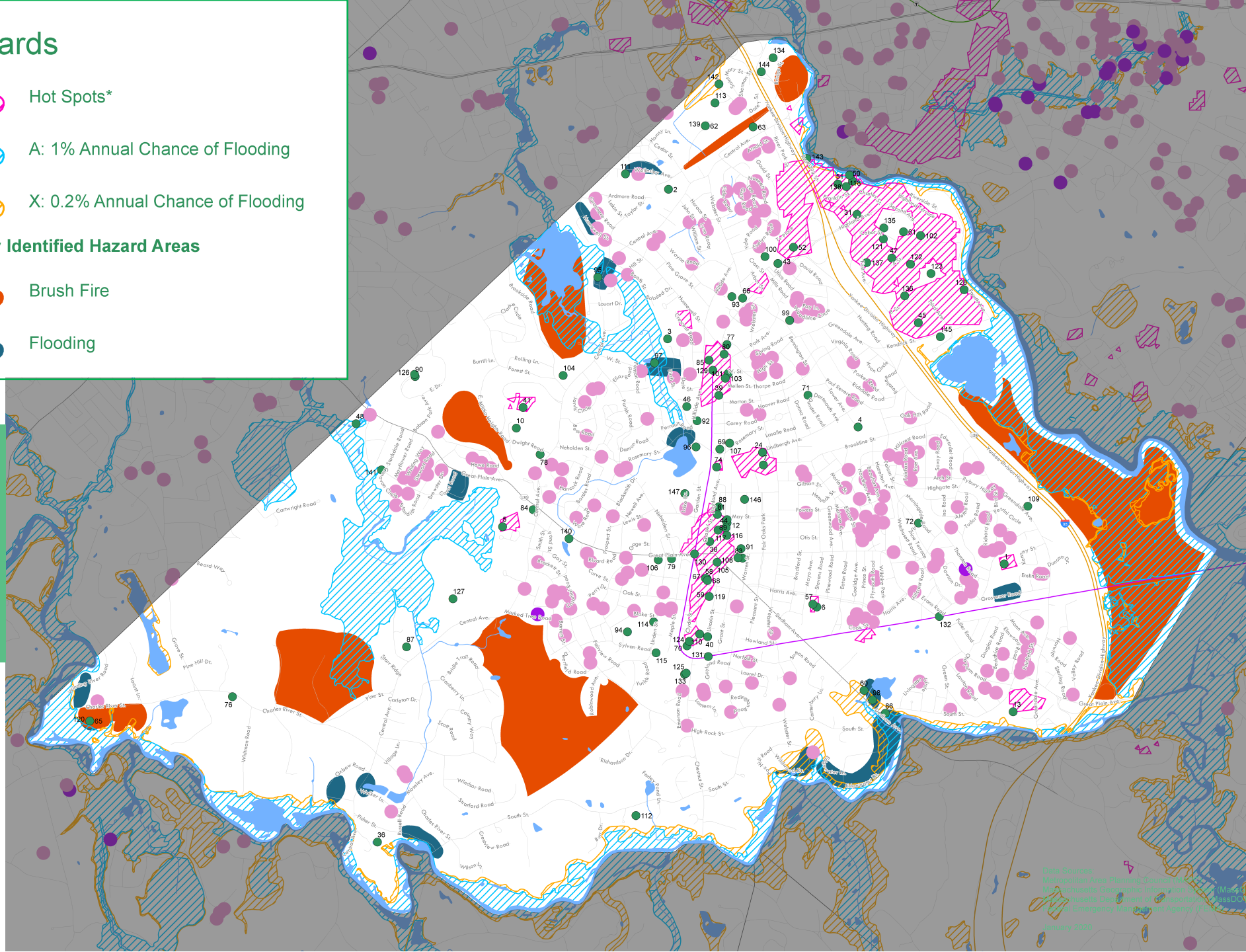
- Hot Spots*
- A: 1% Annual Chance of Flooding
- X: 0.2% Annual Chance of Flooding

Locally Identified Hazard Areas

- Brush Fire
- Flooding

NEEDHAM

Critical Infrastructure



Data Sources:
 Metropolitan Area Planning Council
 Massachusetts Geographic Information System
 Massachusetts Department of Transportation
 Massachusetts Department of Emergency Management and Agency
 January 2020

Social Vulnerability

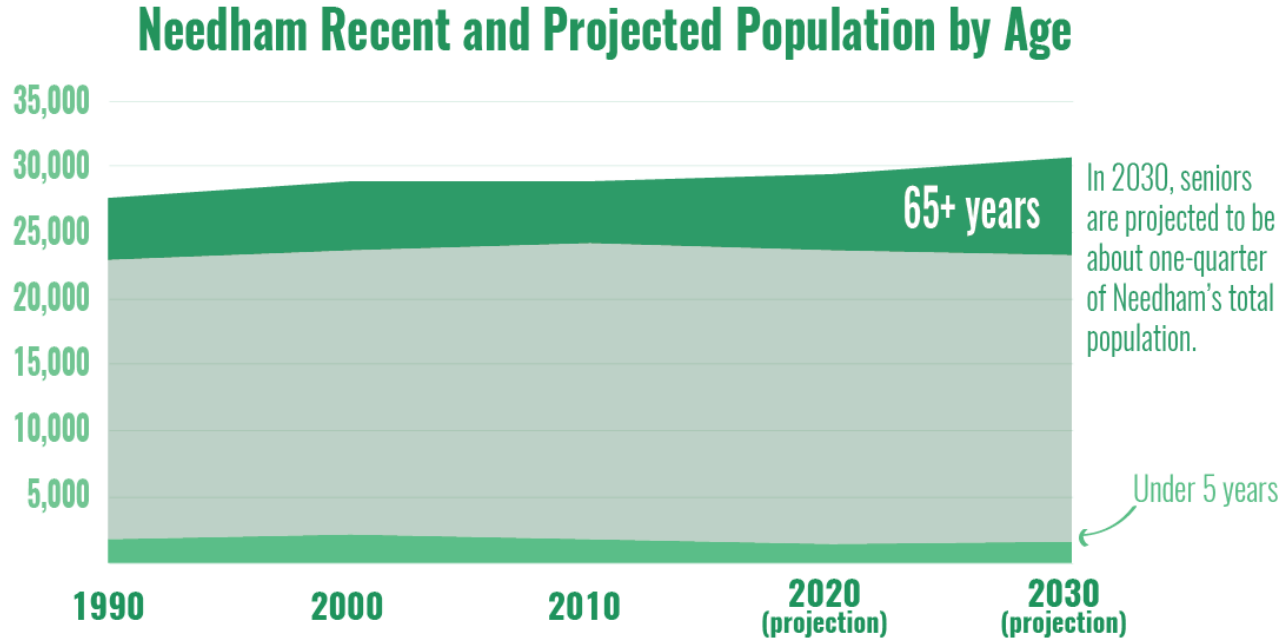
Who is most at risk from climate change impacts?

People who may be more susceptible to negative health effects

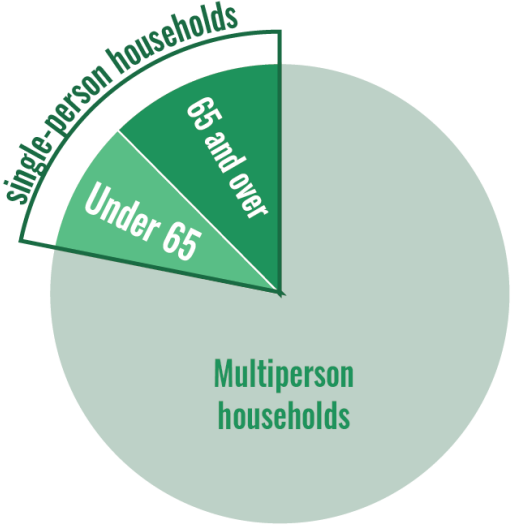
- People who may have more difficulty adapting to, preparing for, or recovering from extreme weather events
- People who live or work in vulnerable locations

Social Vulnerability

Older Adults and Young Children



People Living Alone



As of 2010, about 22% of Needham households consisted of someone living alone.

57% of people living alone were over 65.

Social Vulnerability

Low-Income Households

19.8% $\pm 2.7\%$ of households
in Needham are low-income

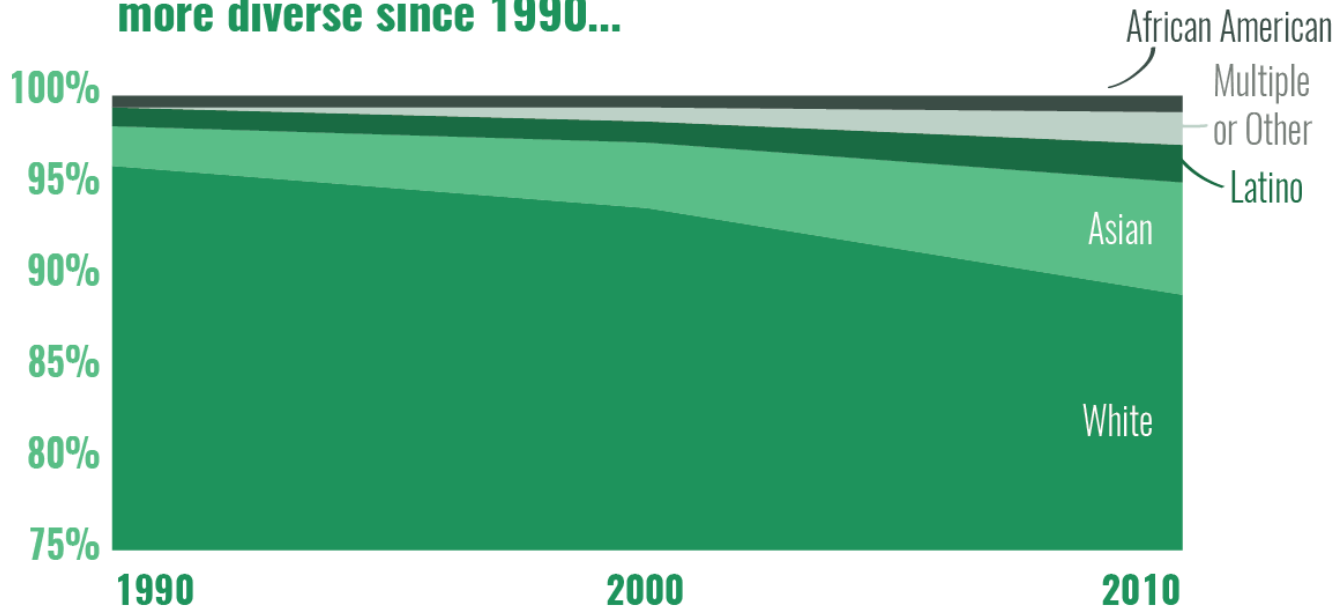
5.8% $\pm 1.5\%$ of households
in Needham are below the poverty level

39.8% $\pm 6.4\%$ of seniors in Needham are low-income

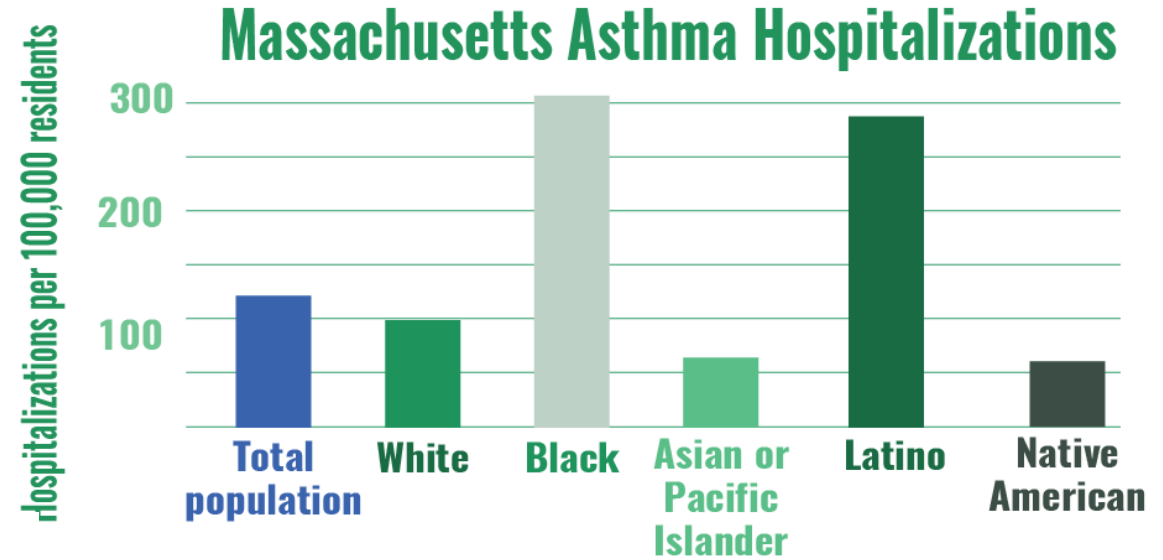
*A four-person household earning less than \$78,150 is considered low-income; a four-person household earning less than \$24,563 is below poverty level

Social Vulnerability

Needham is almost 90% white, but has become slightly more diverse since 1990...





Communities of Color





Risk	Impact
Warming	Expected to shift forest type from Maple/Birch/Beech forest to Oak/Hickory forest similar to New Jersey. New pests and diseases
Flooding, Drought, Wildfire, Ice Storms	Weakens and damages trees

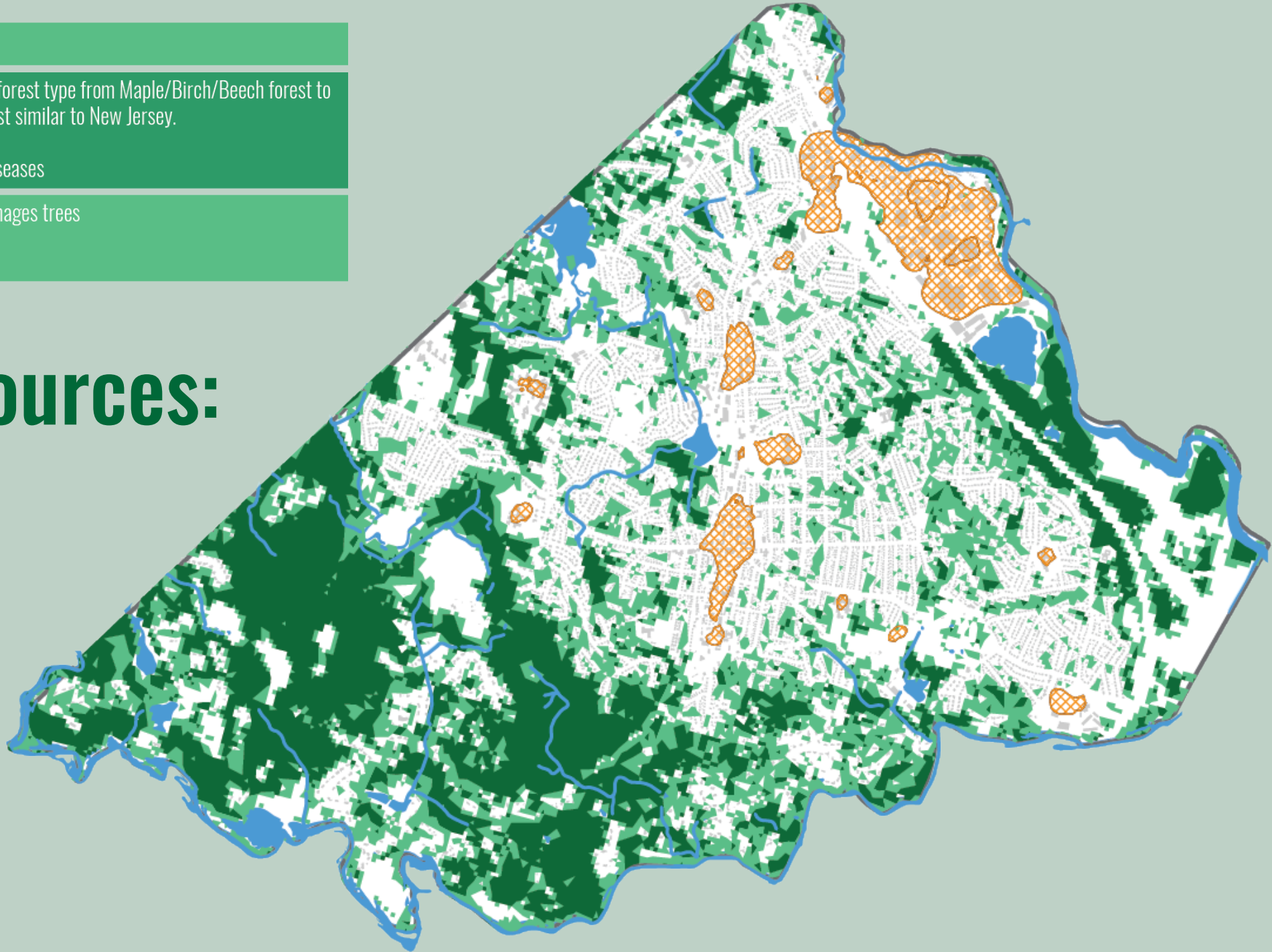
Natural Resources: Trees

 Hot Spots

 50% – 75% Tree Cover

 75% – 100% Tree Cover

 Developed Land



Natural Resources: Valuable Habitat

 Coldwater Fisheries

 Vernal Pools

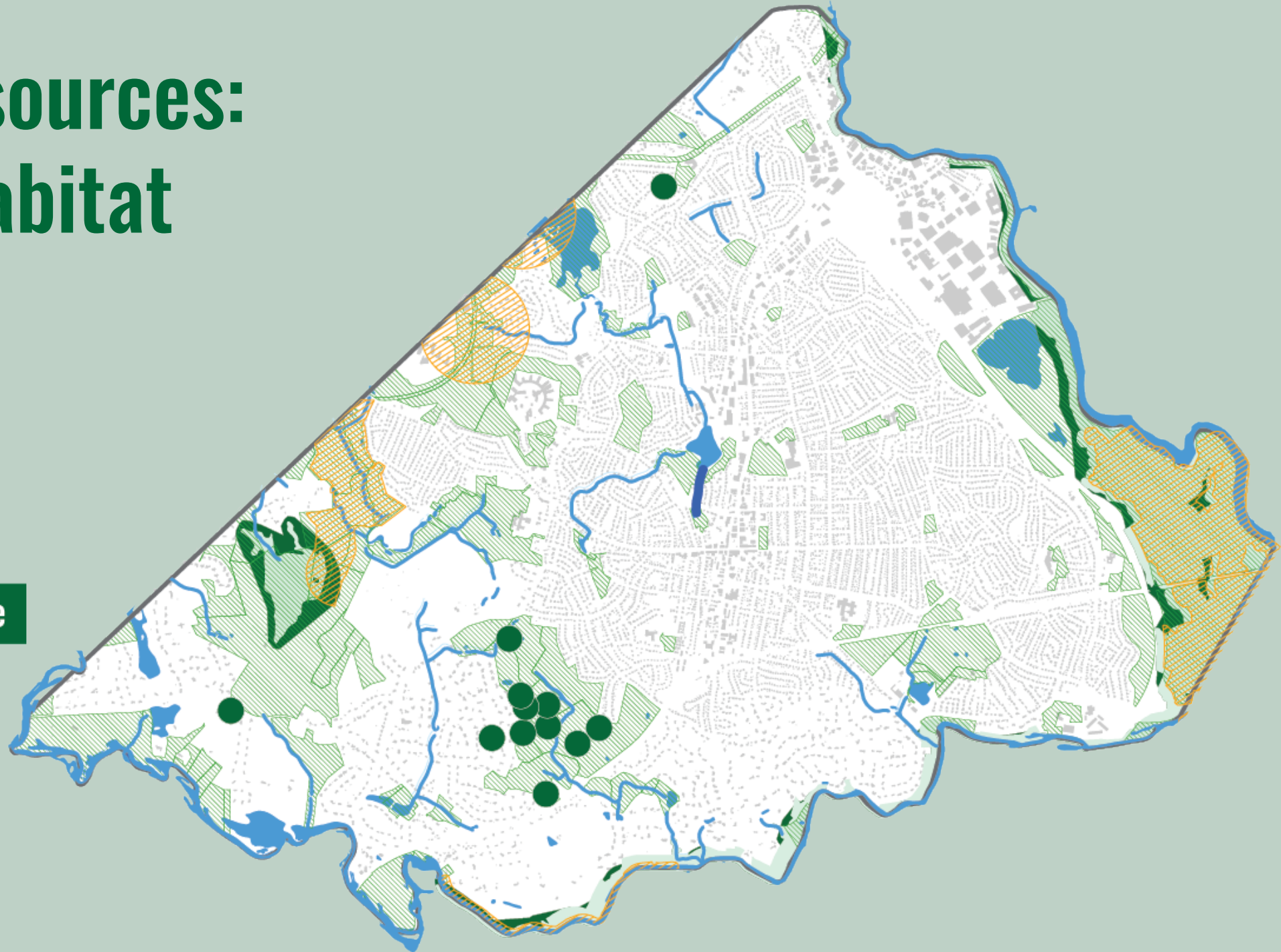
 Core Habitat

 Critical Natural Landscape

 Rare Species Habitat

 Open Space

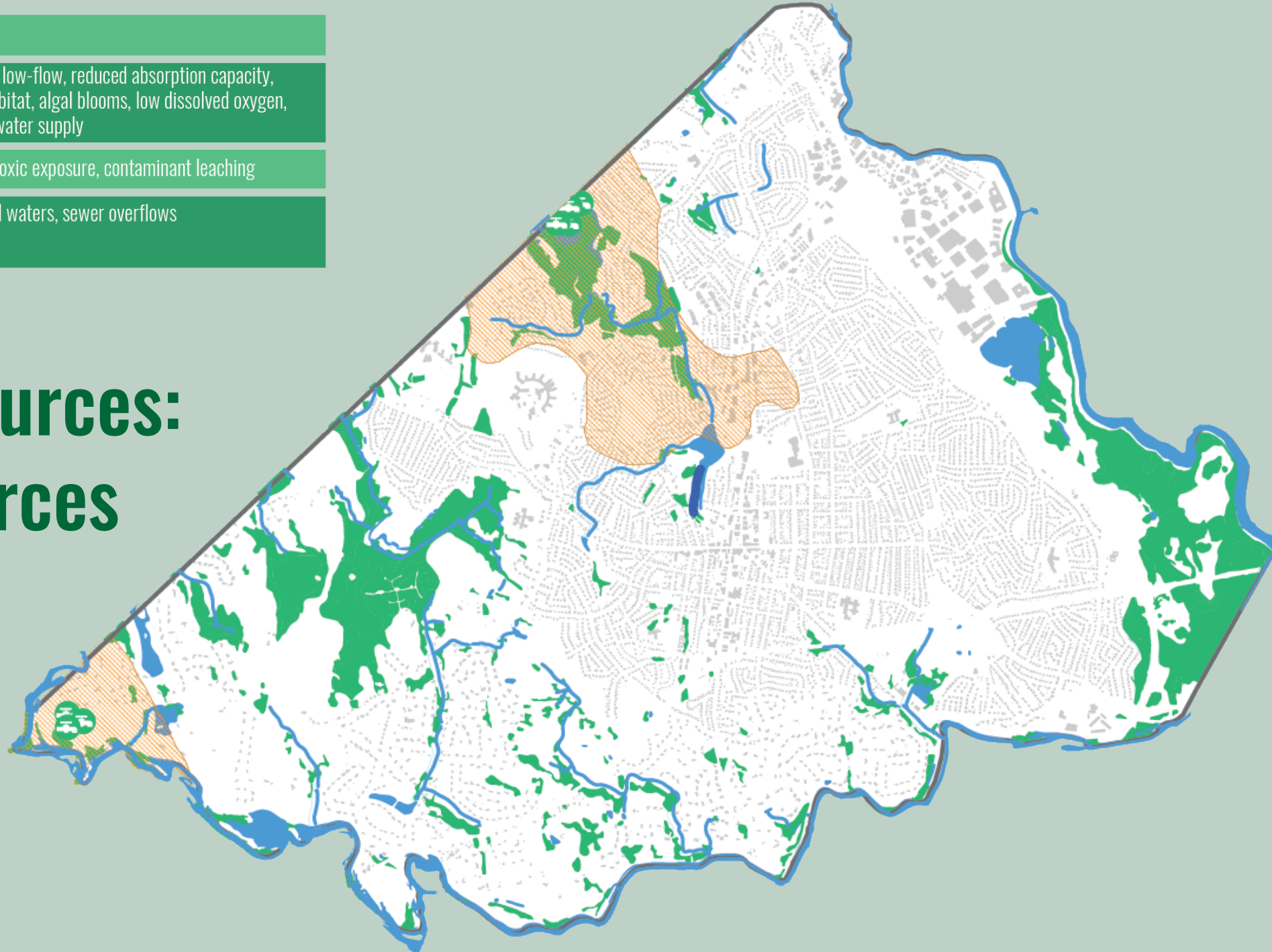
 Developed Land



Risk	Impact
Drought/Warming	Seasonal no-flow/ low-flow, reduced absorption capacity, diminished fish habitat, algal blooms, low dissolved oxygen, reduced drinking water supply
Flooding	Impaired waters, toxic exposure, contaminant leaching
Extreme Precipitation	Scouring, impaired waters, sewer overflows

Natural Resources: Water Resources

-  Coldwater Fisheries
-  Wellhead Protection Areas (Zone II)
-  Groundwater Pumping Station
- Wetlands**
- Developed Land**



Action | Stormwater

- Funding
- Long-term plan
- Nature based solutions
- Address on large developments - residential

Analyze & plan for retrofitting stormwater systems with limited capacity. Ensure new development has met stormwater capacity.

14

Sewer | Yellow-Info

Water Infrastructure

- Monitor assess vulnerabilities, protect
- Water treatment Plant & wells
- St. Marys Pump Station
- Town Water connections
- 10 Sewer Pump Stations
- Stormwater discharge system

Find ways to protect the perimeter of the wells and treatment plant

4

Action | Ticks & Insects

- More education & communications w/ public
- Look at Mosquito control
- Maybe develop regional plan

Study & support environmentally-friendly mosquito control, including public education about limiting standing water.

Education & Communication about Mosquito/tick born illnesses and extreme heat.

ORANGE

BRIDGES | Yellow-Info

Upgrade Central Avenue Bridge

Coordinate with Dover

3

Permanent shade structures for

- Policy SOP
- Heat Exposure Guidelines.

6

Action | Wetlands

- Education for public
- Wetlands by-law to incorporate more climate concerns & resiliency

3

TREES | Yellow-Env't

- Work on Tree By-law
- ID areas to plant trees
- Assess vul. to fire, pests, etc

Forest Management & Invasive species Management

ORANGE



Create a disaster response plan including an evacuation plan.

ORANGE

Map green sites with hazardous materials

Identify & communicate to hospital

1

Action | Seniors/Public Health Pop.

- Building/infrastructure
- green spaces - More
- Communications & coordination plan for emergency

Develop list of at-risk people for wellness visits during disasters. Communicate lists to hospital to ensure capacity for all potential sickly patients.

4

Develop a communications network include a neighbor to neighbor reach out.

ORANGE

Upgrade Public Communications esp for Seniors, Low Income, Language limited, people with Disabilities

- Reach people via cell phones, etc

7

COMMUNICATIONS

- Robust Infrastructure
- Cyber security
- redundancy
- generator back up

10

OUTREACH

- Senior Population
- Disabilities
- Non-English Speaking
- People who work in Needham that don't live here

8

Highest Priorities

- **Communication:** Target seniors, low income residents, limited English speakers, people with disabilities, with cell phones, those who work in Needham but live elsewhere. Create a neighbor-to-neighbor program.
- **Health Impacts:** Provide outreach and education about extreme heat impacts and, mosquito and tick-borne illnesses. Develop heat exposure guidelines.
- **Stormwater:** Provide needed funding and a long-term plan. Ensure new developments have increased capacity, incorporate nature-based solutions and, analyze and plan for retrofits of undersized systems.
- **Water infrastructure:** Assess vulnerabilities of the system. Protect the wells and water treatment plant. Protect the St. Mary's Pump Station, town interconnections, and sewer pump stations.
- **Tree and Forest Management:** Develop a forest management plan to address invasive species, pests, and vulnerability to fire. Develop a tree bylaw. Identify locations to plant trees.
- **Ensure robust infrastructure:** Consider cyber security, redundancy, and generator backup.
- **Central Avenue Bridge:** Upgrade the bridge; coordinate the work with the Town of Dover.
- **Wetlands:** Incorporate climate resiliency in the local bylaw. Educate the public on the value of wetlands.
- **Seniors in public housing:** Upgrade the building and infrastructure. Create additional green space. Develop a communications and coordination plan for emergencies.
- **Residents with medical needs:** Develop a list of medically fragile people for wellness visits during emergencies. Communicate the list with the hospital to ensure capacity in the event of emergency.
- **Disaster response:** Create a plan that includes evacuation strategies.
- **Focus on hazardous materials:** Map hazardous materials sites; share the information with the hospital.

Thank you

**Where to find more
information**

How to give your feedback