

Climate Action Plan



MUNICIPAL SUBREGIONAL WORKSHOP
UPPER CAPE - 10/13/2020

MEETING AGENDA

Objectives

- Introduce the Cape Cod Climate Action Plan process
- Clarify existing understanding of regional hazards, vulnerabilities, and priorities, and climate adaptation and mitigation opportunities
- Identify current municipal priorities, barriers and needs, and opportunities for regional, sub-regional, and local action.

12:30-12:45 Welcome and Introductions

12:45-12:55 Introduction to the Cape Cod Climate Action Plan Process

12:55-1:30 Climate Risks, Hazards, Vulnerabilities, and Priorities

1:30-2:05 Priority Municipal Adaptation and Mitigation Actions
Small Group Reports

2:05-2:20 Break

2:20-3:20 Identifying Opportunities and Barriers to Implementation
Small Group Reports

3:20-3:30 Public Comment

Welcome and Introductions



Cape Cod Climate Action Plan



Process



CAPE COD CLIMATE INITIATIVE

A community-focused, information-based effort to inform a strategic framework and collaborative approach to address the region's contributions to and threats from climate change.



CAPE COD CLIMATE INITIATIVE

COMMUNITY MEETING SERIES

Feedback obtained helped to better understand actions taken to date, structure a stakeholder process, and identify priorities for development of the **climate action plan**.



Community Climate Meetings

OCTOBER 2019

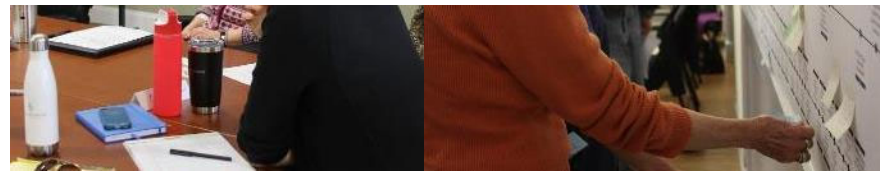
Chatham • Wellfleet • Yarmouth • Mashpee



Climate Initiative Focus Groups

JANUARY 2020

Young Professionals and Educators • Municipal Staff • Environmental Groups • Town Energy Committees • Sustainable Economic Development Pillar





Climate Change Action Timeline

[Home](#) > [Work](#) > [Climate Change Action Timeline](#)

About

The Climate Change Action Timeline is a compilation of organizations, reports, and events that have helped shape and advance the recognition and understanding of the causes and effects of climate change, and action taken to mitigate and adapt to its impacts. The timeline is intended to document local and regional efforts on this issue, and to be a tool for access to resources and information. We welcome relevant additions and corrections at climate@capecodcommission.org.

[All](#)[Global](#)[Federal](#)[State](#)[Regional](#)[Local](#)



Local

Truro Energy Committee established

1992

1992

Chatham joins Community Rating System

Orleans joins Community Rating System

1993

1995

Harwich joins Community Rating System

Three Bays Preservation formed (now known as the Barnstable Clean Water Coalition)

1996

2000

Orleans Wind Energy Committee formed

Falmouth Energy Committee established

2001

2018 Regional Policy Plan Climate Change Actions



GREENHOUSE GAS EMISSIONS INVENTORY

Regional baseline of
greenhouse gas emissions



EV CHARGING STATION SITING ANALYSIS

Potential electric vehicle
charging station locations



SOLAR SCREENING TOOL

Sites for utility scale solar
or energy storage



Cape Cod Climate Initiative

[Home](#) > [Work](#) > [Cape Cod Climate Initiative](#)

Climate change is a key challenge facing the natural, built, and community systems of Cape Cod. Cape Cod is vulnerable to climate-related hazards, such as sea level rise, storm surge and flooding, erosion, damaging winds, elevated summer temperatures, and wildfire. These hazards put vulnerable populations at risk and can cause loss of life, damage buildings and infrastructure, impair coastal environments, and otherwise impact a community's economic, social, and environmental well-being, including impacting how Cape Cod's ecosystems function.

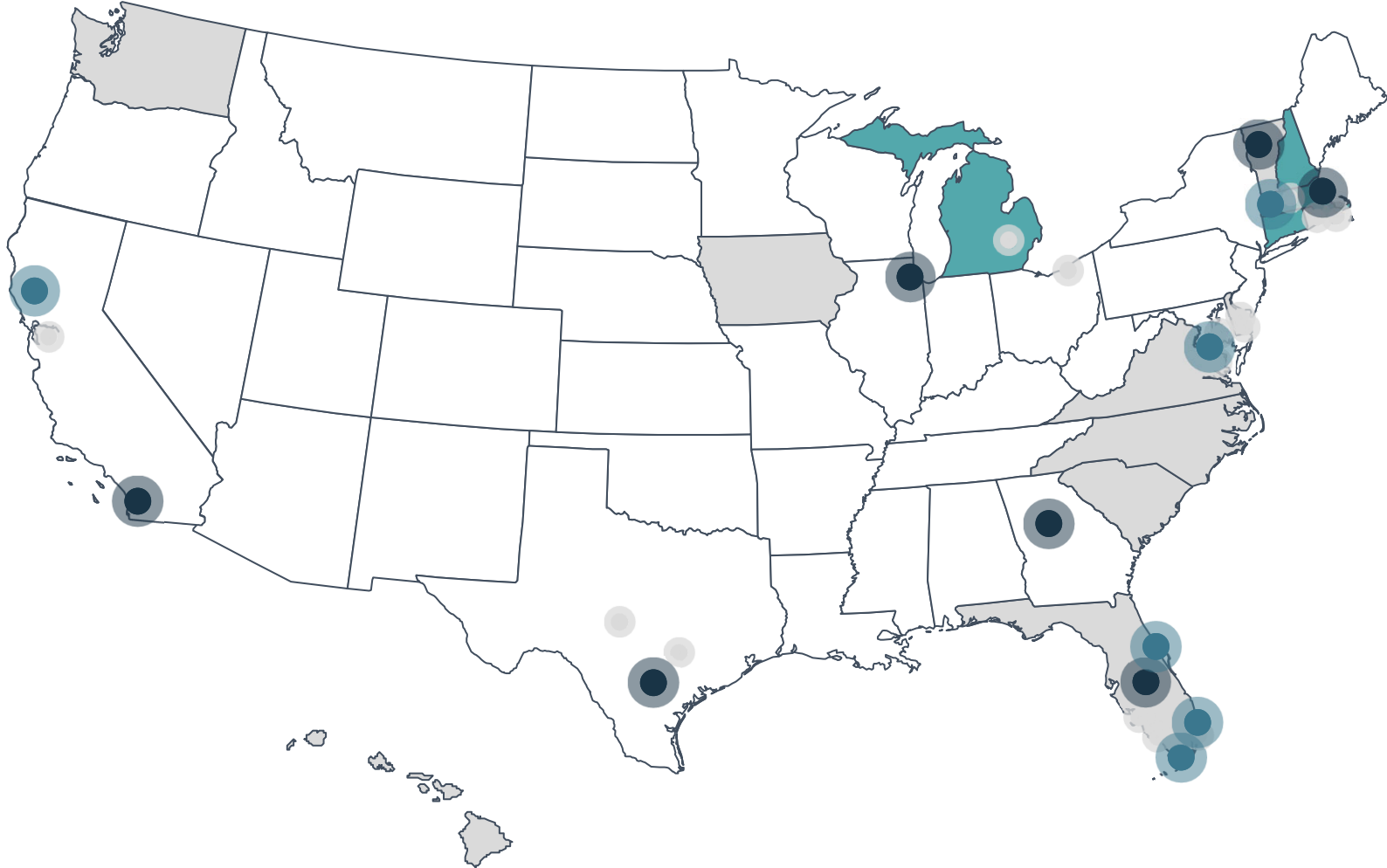
Mitigating the causes of climate change and adapting to its effects on Cape Cod involves regional planning and policy decisions with both environmental and economic considerations.



Stakeholders

If you are interested in participating, [please complete this form](#). The Cape Cod Commission is seeking stakeholders to participate in

CLIMATE ACTION PLAN LITERATURE REVIEW



Total Plans Collected (46)
Plans Selected for Review (17)

Plans Reviewed



City/Town

- Atlanta, GA
- Boston, MA
- Burlington, VT
- Chicago, IL
- Orlando, FL
- San Antonio, TX
- San Diego, CA



Regional

- Metropolitan Washington (DC)
- Monroe Co., FL
- Pioneer Valley, MA
- Sonoma Co., CA
- Southeast FL
- Volusia Co., FL



State

- Connecticut
- Massachusetts
- Michigan
- New Hampshire



Additional Plans Collected

- City/Town - 11
- Regional - 3
- State - 10
- Other - 5

Elements of a Climate Action Plan

What is a Climate Action Plan?

A climate action plan is a strategic framework that details the policies, measures, and activities a community will take to reduce greenhouse gas emissions and track progress.

Common Components

- Regional and local climate risks and vulnerabilities
- Baseline greenhouse gas emissions
- Goals
- Identify adaptation and resiliency measures
- Identify policy options and mitigation actions
- Forecast impacts of mitigation actions
- Recommendations and strategy for implementation





GHG Inventory
sets the baseline to
measure emissions
going forward

Create quantifiable
**performance
measures**

**Engage
community**
on strategy
development

Draft **Climate
Action Plan**



Cape Cod Climate Action Plan



Subregional Municipal Working Groups to better understand local goals, capacity, and needs relative to climate action

FALL

Subregional
Municipal
Working
Groups

Stakeholder
Working
Groups
#1 and #2

Focus Group
#1

Stakeholder
Working
Group #3

Focus Group
#2

WINTER

Climate Risks, Hazards, Vulnerabilities, and Priorities



MA Climate Projections

BY END OF CENTURY

CHANGES IN PRECIPITATION

- 18% increase in consecutive dry days
- 57% increase in days with > 1 in. rainfall
- 7.3 inches additional annual rainfall

RISING TEMPERATURES

- 10.8°F increase in average annual temperature
- Up to 64 fewer days/yr with min. temperatures < 32* F
- Up to 64 more > 90-degree days/year

SEA LEVEL RISE

- 4-10.5 feet along the MA coast

EXTREME WEATHER

- Increase in frequency and magnitude

Upper Cape

PLANNING LAYERS

CLEAR



Sea Level Rise



Infrastructure



Erosion



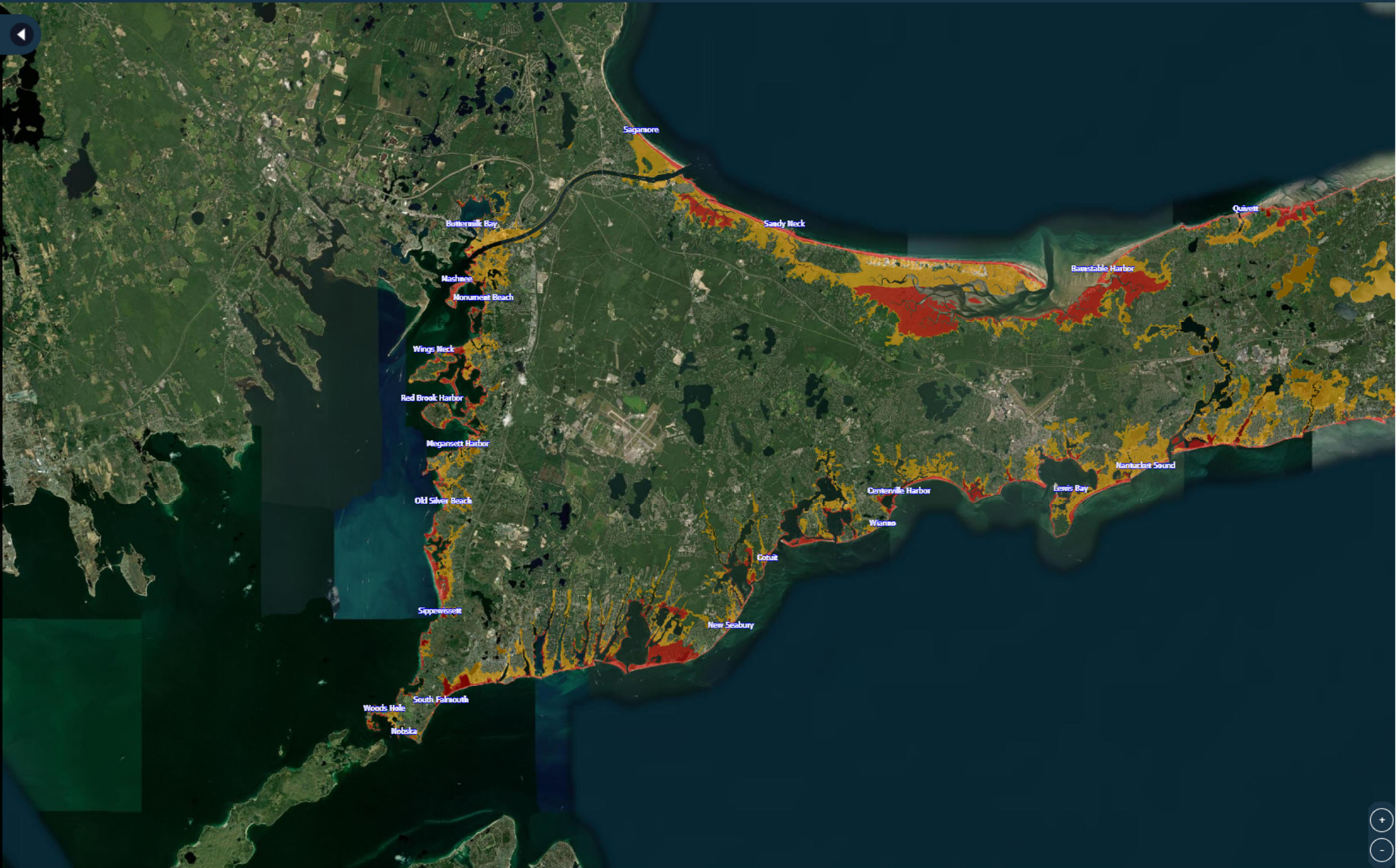
Inundation



Flood Zone

A AE AO VE

SLOSH



PLANNING LAYERS

CLEAR



Sea Level Rise



Infrastructure



Erosion



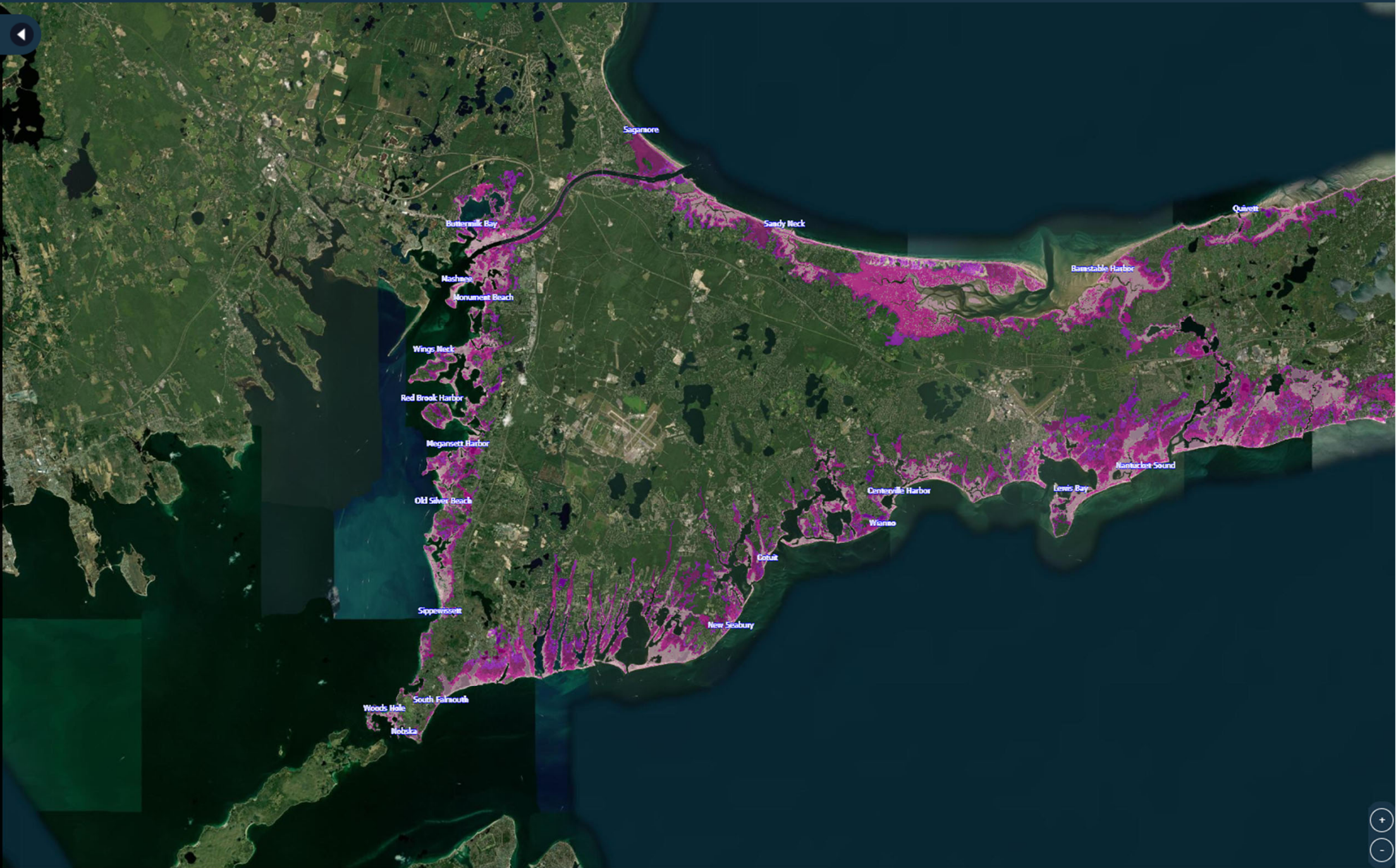
Inundation



▼ Flood Zone

✓ SLOSH

- CAT1
- CAT2
- CAT3
- CAT4



PLANNING LAYERS

CLEAR



Sea Level Rise



- Sea Level Rise
 - 1ft - **2ft** - 3ft - 4ft - 5ft - 6ft

- Disconnected Roads
 - 1ft - **2ft** - 3ft - 4ft - 5ft - 6ft

- Critical Facilities

Infrastructure

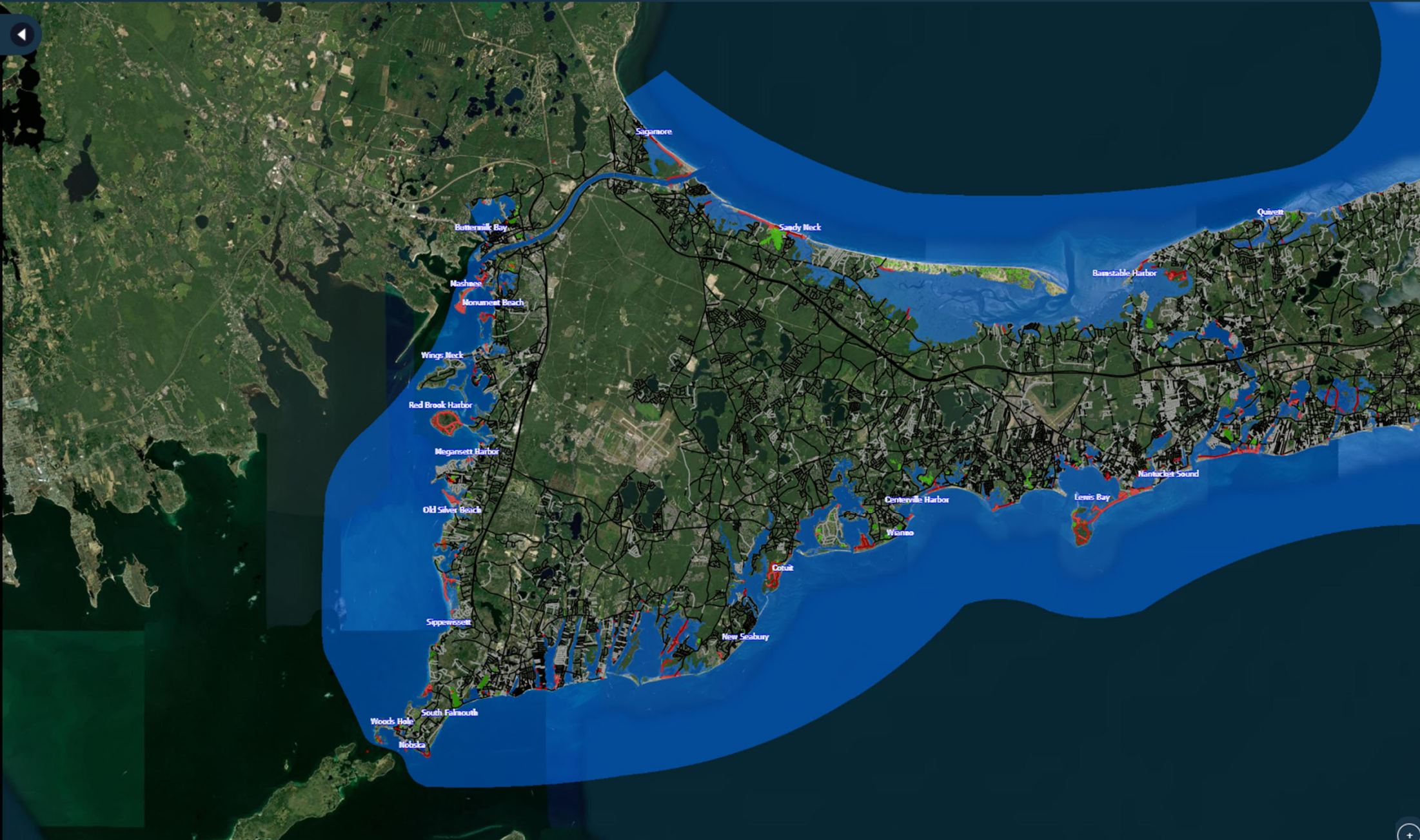


- Municipal Properties
- Public and Private Roads
 - Private Public
- Sewered Parcels
- Coastal Defense Structures
- Structures
- Historic Districts
- Historic Places

Erosion



Inundation



PLANNING LAYERS

CLEAR



Sea Level Rise



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Infrastructure

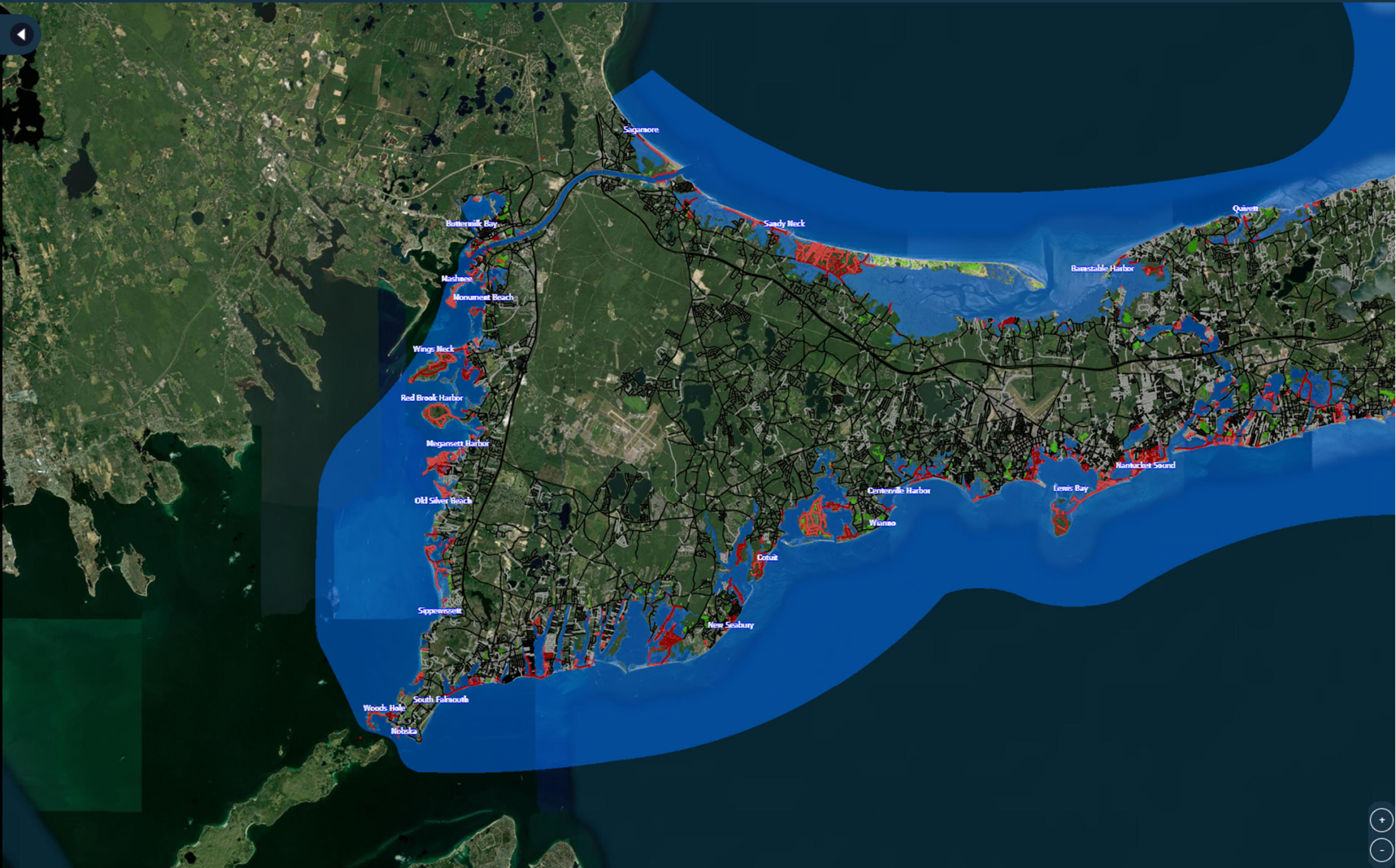


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Inundation



PLANNING LAYERS

CLEAR



Sea Level Rise



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Critical Facilities

Infrastructure

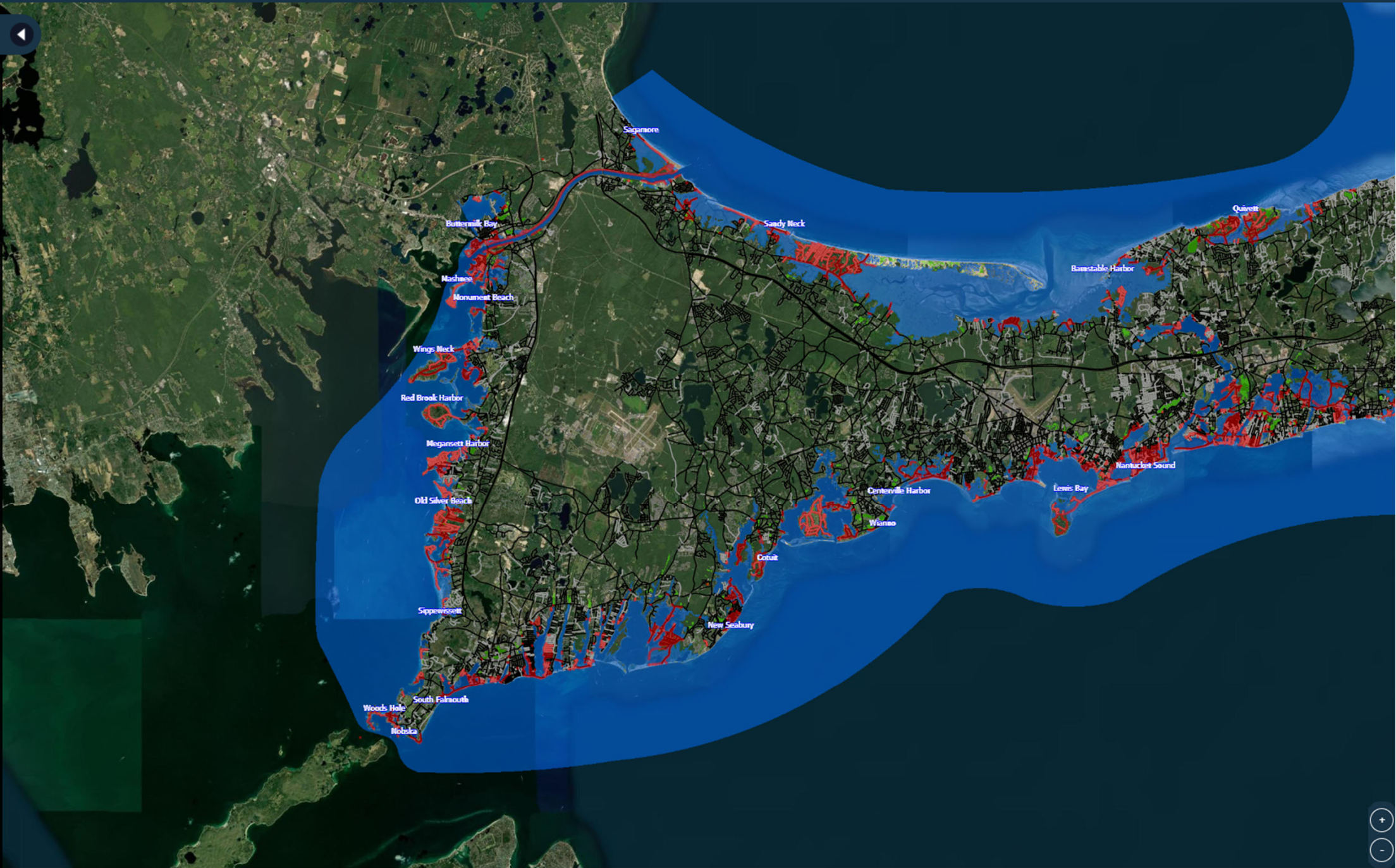


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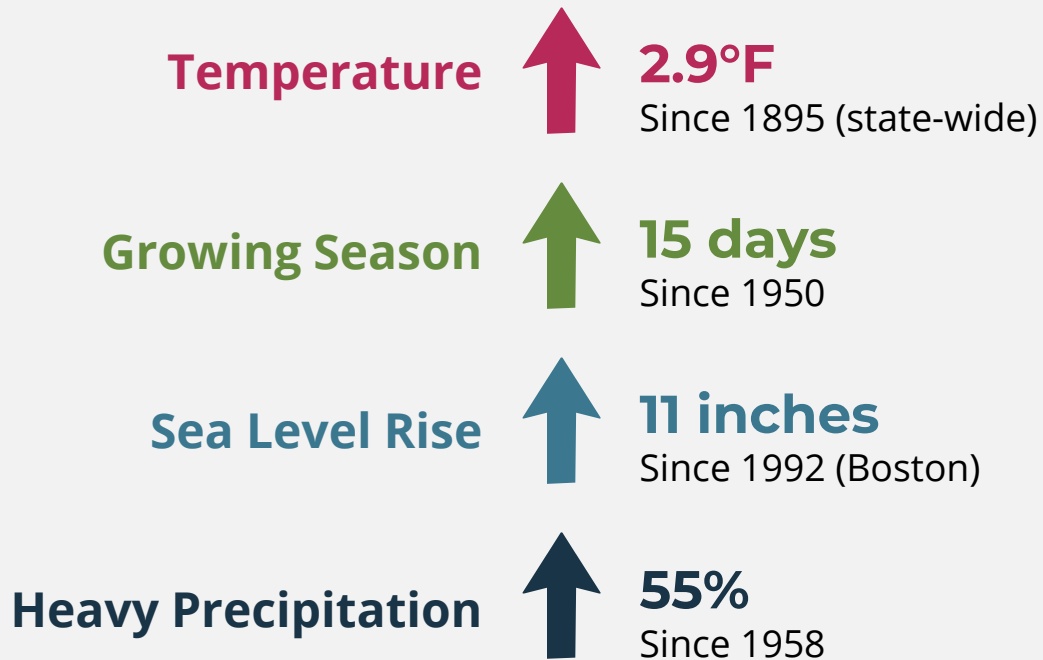
Erosion



Inundation

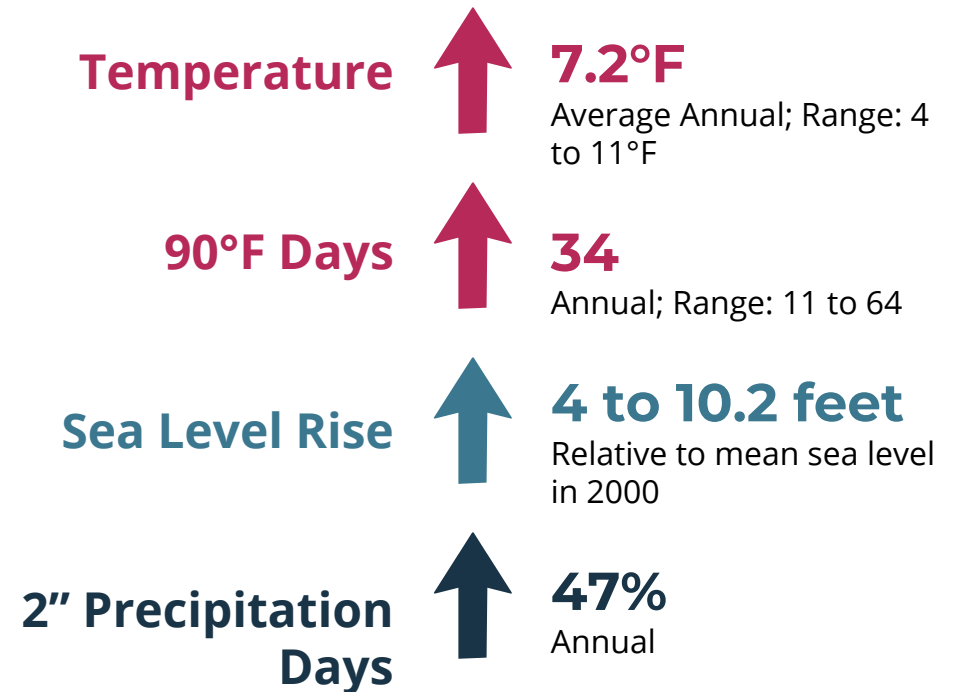


Massachusetts Observed Climate Changes



Source: Climate Science Special Report, 2017; NOAA NCEI nClimDiv; NOAA Ocean Service

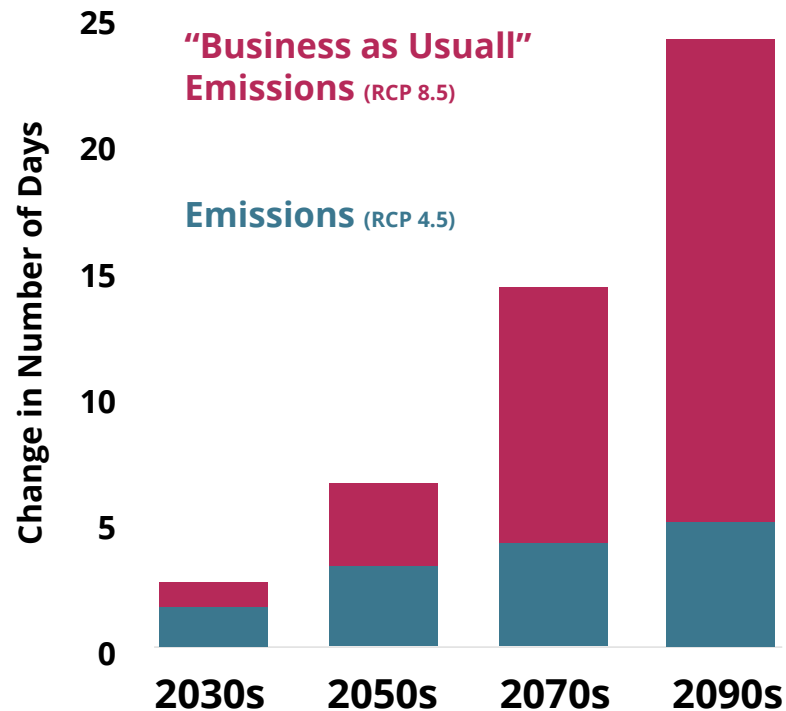
Massachusetts Climate Changes Projected by the 2090s



Source: Northeast Climate Adaptation Science Center

Summer Days Over 95°F

Massachusetts

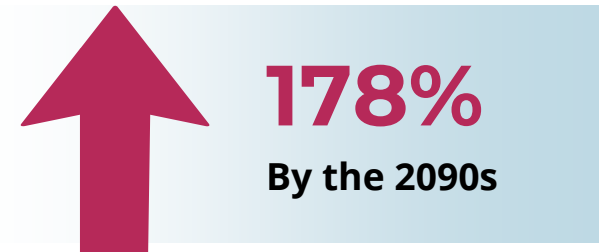


Data courtesy A. Karmalkar, Northeast Climate Adaptation Science Center. Figure by D. Brown

More Warm
Winter Days,
Less Heating
Demand



More Warm
Summer Days,
More Cooling
Demand



Source: Northeast Climate Adaptation Science Center, ResilientMA.org, accessed 2018.

Massachusetts Climate Changes Projected by the 2090s |



Find maps, data products, reports, articles...

Search



County ▾ Barnstable County, MA ▾

Calculated Variable:

Consecutive Dry Days ▾

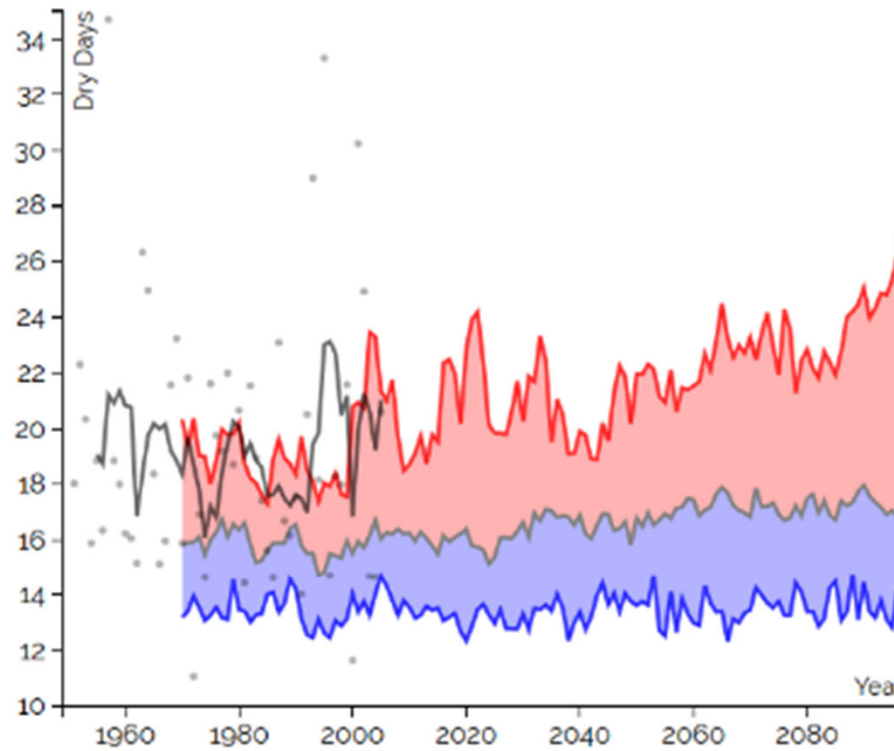
Season: Annual ▾



Add Chart

Remove this Chart

Annual Consecutive Dry Days Barnstable County, MA



Download Data

Observed

5-yr Mean days

**Modeled days
2095-2099**

Max 27.27 /
Median 17.2 /
Min 13.92 /

Changes from
1971-2000 for:

2020 -	-1.84days
2049 -	-1.30days
2069 -	-1.03days
2080 -	-0.95days
2097 -	-0.95days

County ▾ Barnstable County, MA ▾

Calculated Variable:

Maximum Temperature ▾

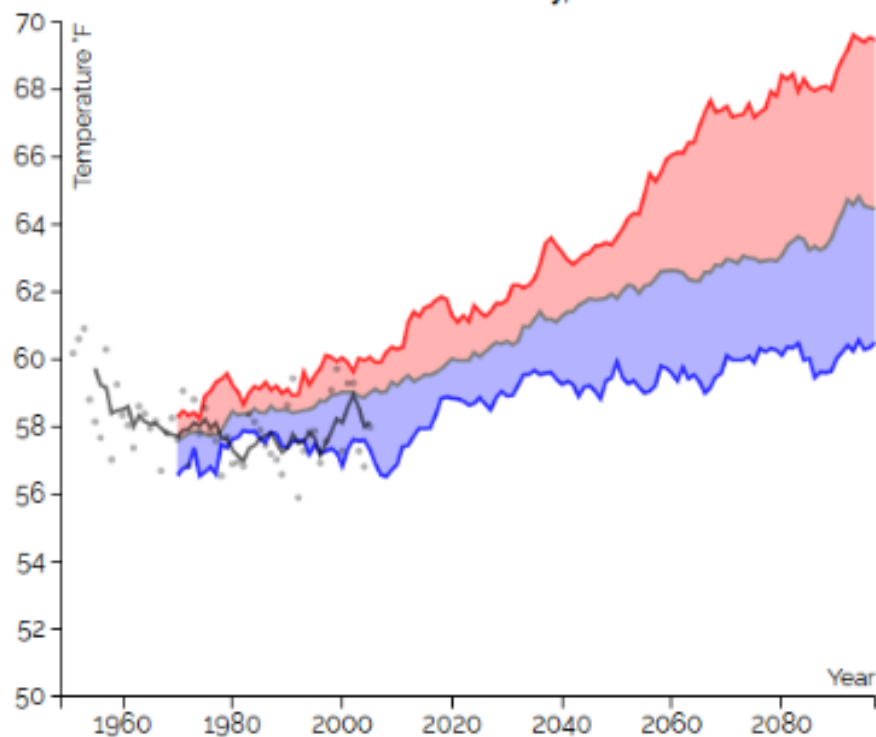
Season: Annual ▾



Add Chart

Remove this Chart

Annual Maximum Temperature Barnstable County, MA



Download Data

Observed	
5-yr Mean	▾
Modeled °F	
Max	▬
Median	▬
Min	▬
Changes from 1971-2000 for:	
2020 -	3.40°F
2049 -	4.55°F
2060 -	5.30°F
2089 -	5.95°F
2080 -	5.95°F
2097 -	5.95°F

About the Source
Data

Massachusetts Climate Changes Projected by the 2090s | Precipitation 2"

↑ 47%
Annual



Find maps, data products, reports, articles...

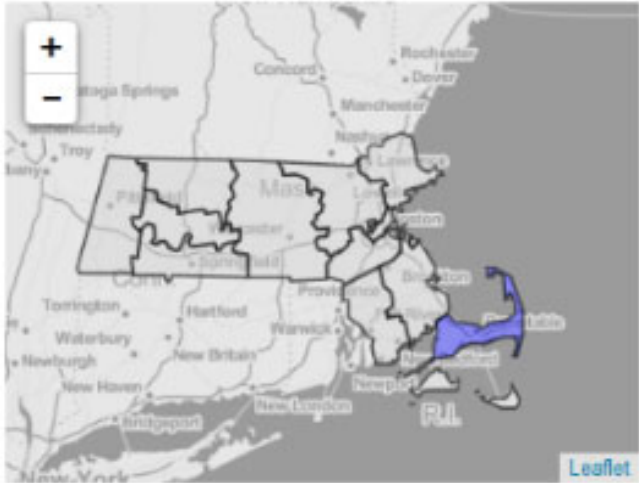
Search

County ▾ Barnstable County, MA ▾

Calculated Variable:

Days with Precipitation > 2" ▾

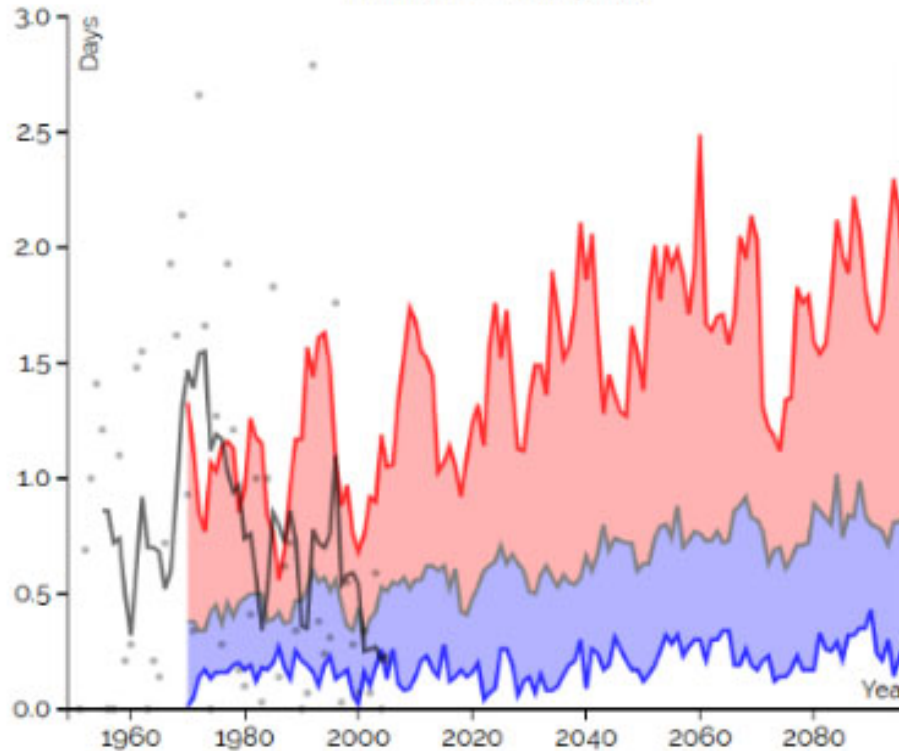
Season: Annual ▾



Add Chart

Remove this Chart

Annual Days with Precipitation > 2"
Barnstable County, MA



Download Data

Observed

5-yr Mean days

5-yr Mean /

**Modeled days
2095-2099**

Max 2.08 /

Median 0.84 /

Min 0.23 /

Changes from
1971-2000 for:

2020 - 0.25days

2049 - 0.37days

2060 - 0.41days

2089 - 0.47days

2097 - 0.47days

MVP PROGRAM

Summary of Cape Cod Priorities

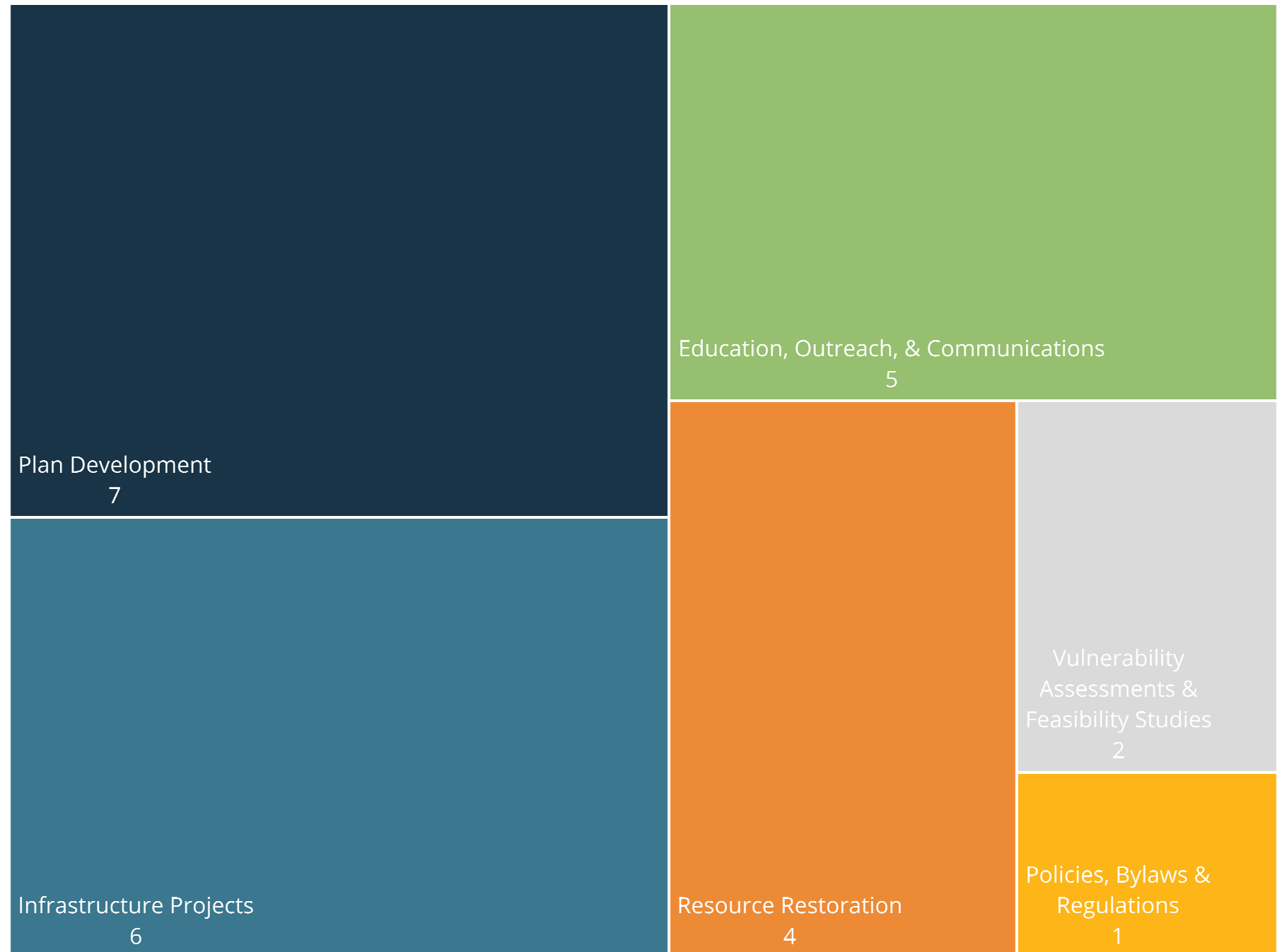
**98 priorities
identified by all 15
towns**



MVP PROGRAM

Upper Cape Priority Summary

**25 priorities
identified**



GHG Inventory

What is a Greenhouse Gas Inventory?

a comprehensive accounting of total greenhouse gas emissions for all man-made sources.

Cape Cod Greenhouse Gas Inventory

Calculate a greenhouse gas inventory that provides a complete picture of greenhouse gas emissions from Cape Cod

Establish an accounting method that is comparable and reproducible so we can measure emissions going forward

Identify high emissions sectors

Develop detailed inventory specific to our region

GHG INVENTORY

Scope

Production-based Emissions

from activities within Barnstable County

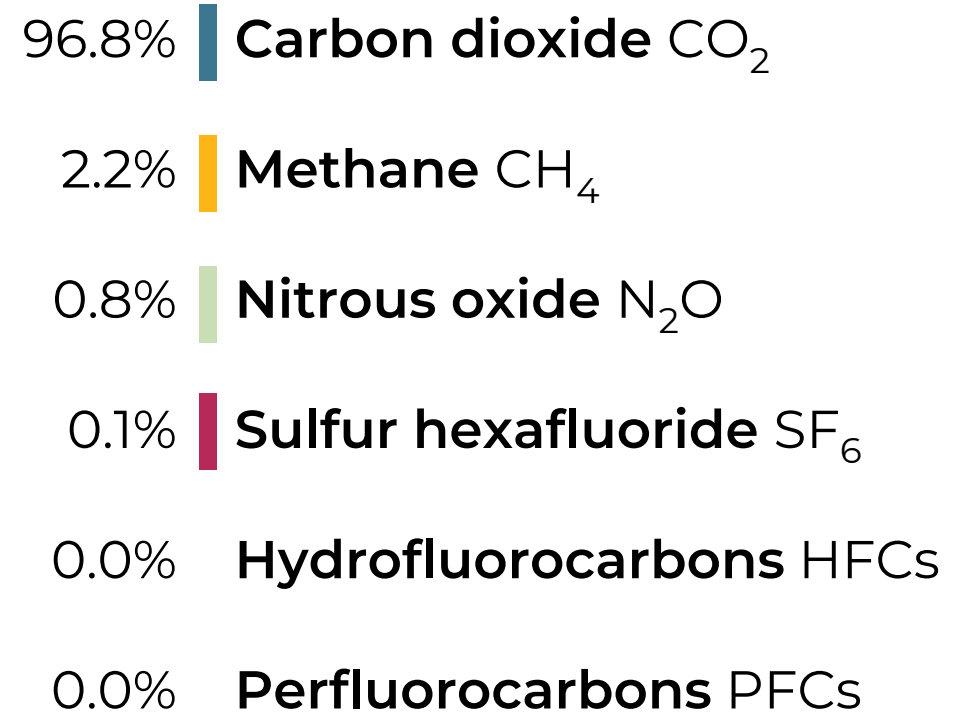
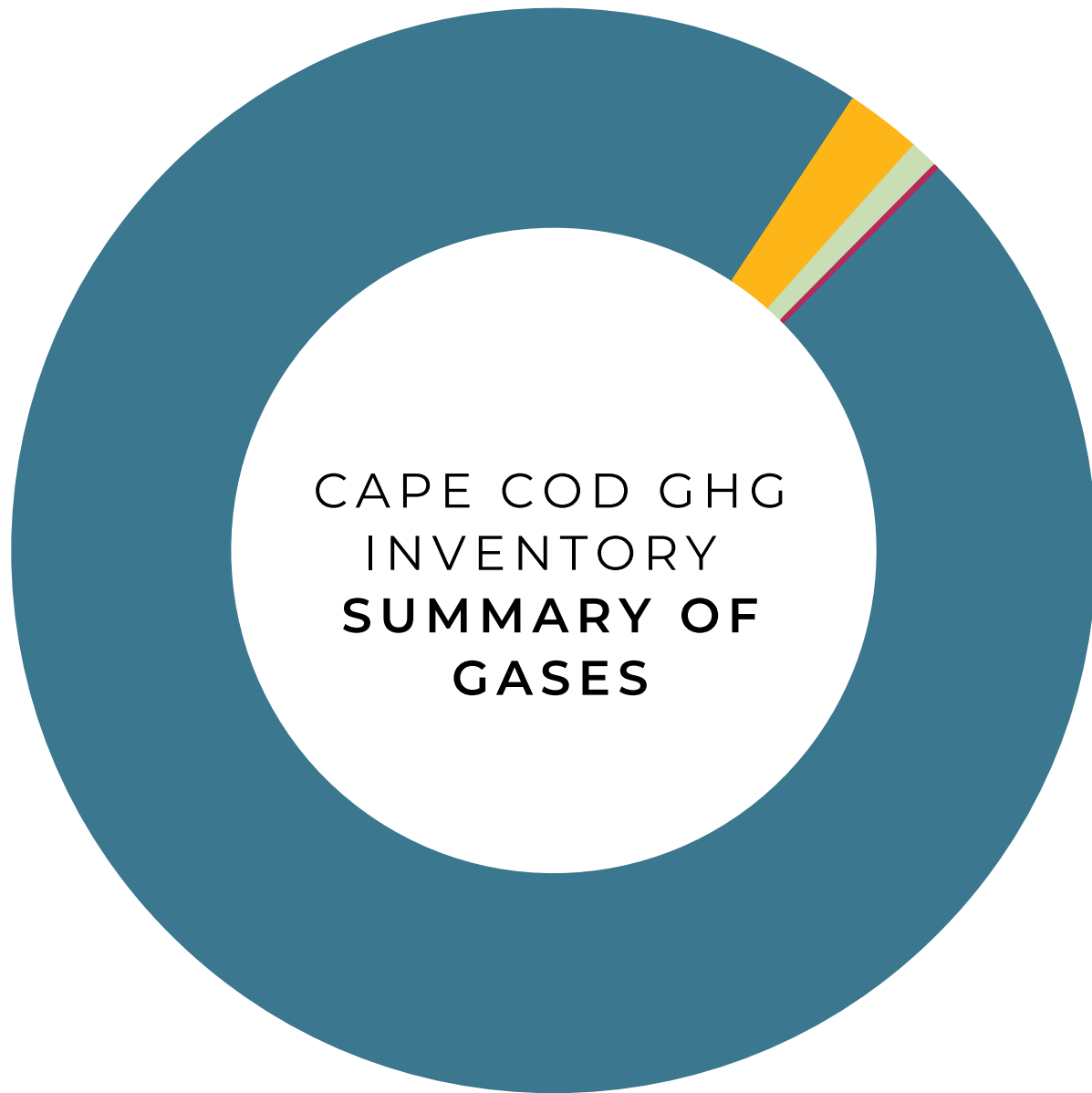
Consumption-based Emissions

from certain activities outside of Barnstable County

Seasonality

consider where appropriate

CAPE COD GHG
INVENTORY
SUMMARY OF
GASES

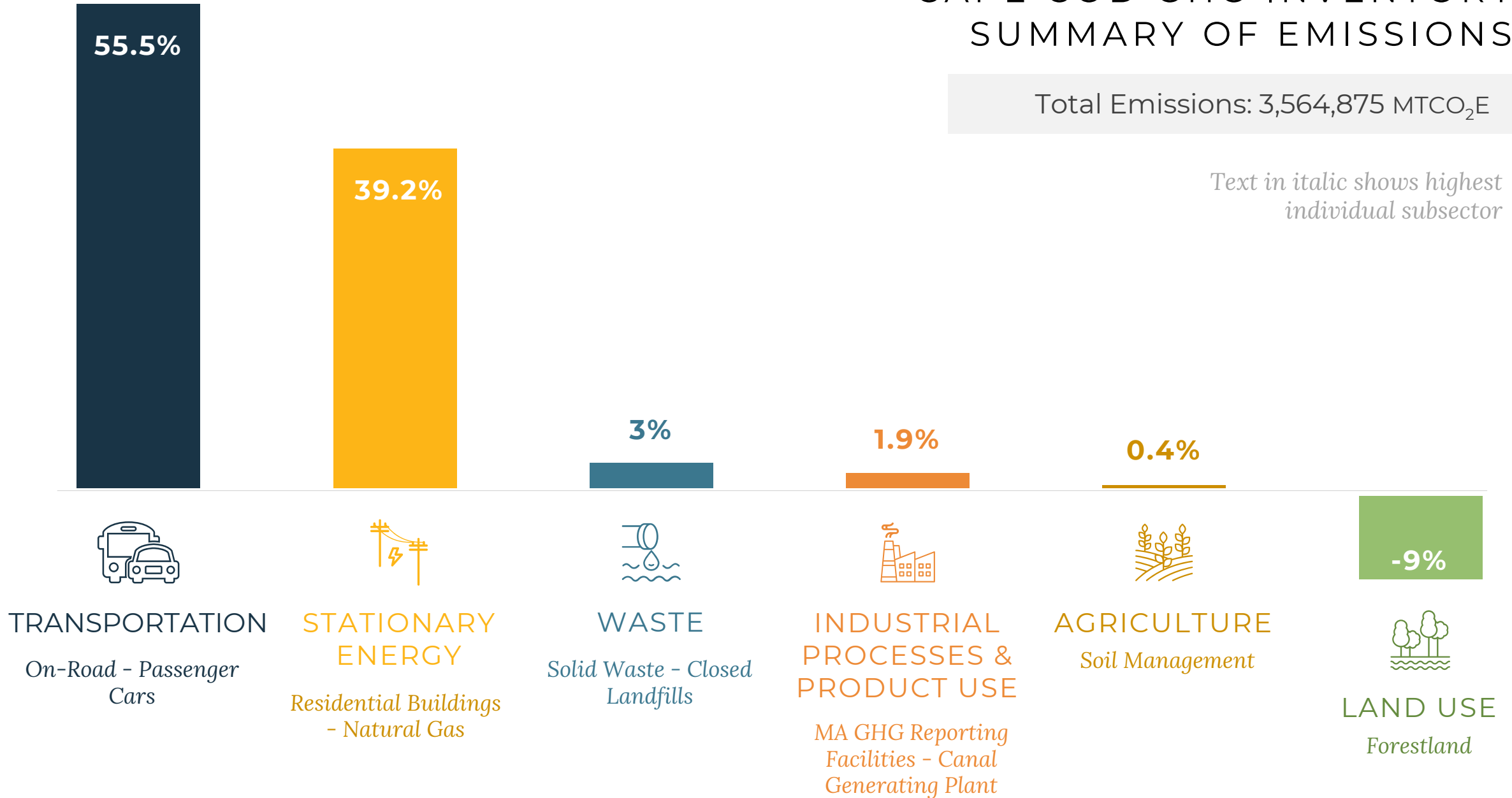


■ CO2 ■ CH4 ■ N2O ■ SF6

CAPE COD GHG INVENTORY SUMMARY OF EMISSIONS

Total Emissions: 3,564,875 MTCO₂E

Text in italic shows highest individual subsector



GHG INVENTORY

Sector Ranking

Highest to Lowest Emissions



STATE

 STATIONARY ENERGY

 TRANSPORTATION

 INDUSTRIAL PROCESSES & PRODUCT USE

 WASTE

 AGRICULTURE



CAPE COD

 TRANSPORTATION

 STATIONARY ENERGY

 WASTE

 INDUSTRIAL PROCESSES & PRODUCT USE

 AGRICULTURE



ADAPTATION

Adjustments in human and natural systems that moderate harm or take advantage of beneficial opportunities



MITIGATION

Limiting or preventing greenhouse gas emissions and enhancing activities that remove these gases from the atmosphere

ADAPTATION

Cooling centers

Elevate roadways

Relocate buildings out of floodplains

Habitat restoration and preservation

Retrofit buildings

Tree preservation

Reduce landfill emissions

Smart growth/land use

MITIGATION

Clean energy

Energy efficiency in new construction

Reuse and recycle

Biking and transit

Priority Municipal Adaptation and Mitigation Actions



BREAK



0:00

Identifying Opportunities and Barriers to Implementation



Public Comment



Climate Action Plan



MUNICIPAL SUBREGIONAL WORKSHOP
UPPER CAPE - 10/13/2020