APCC's Climate Change Programs: Policy, Planning, Science and Implementation

Sippewissett Association

50th Annual Meeting

Falmouth Public Library

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Association to Preserve Cape Cod

Association to Preserve Cape Cod

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Definitions

- **Adaptation:** adjusting to new climate conditions in order to reduce risks.
- **Resilience:** the capacity of a community, business or natural environment to prevent, withstand, respond to, and recover from a disruption.
- **Mitigation:** processes that can reduce the amount and speed of climate change by reducing emissions of greenhouse gases.

U.S. Climate Resilience Toolkit glossary, at https://toolkit.climate.gov/content/glossary .

Policy

- **State Climate Change Adaptation Working Group**: APCC is a member of this Working Group which developed a state-wide ***Hazard Mitigation and Climate Adaptation Management Plan*** for state agencies.

- **State funding for mitigation and adaptation**: APCC supports two state bills to fund adaptation, resilience and mitigation. Governor's bill funds adaptation/resilience, House Speaker's bill ("*Green Works*") would also include $ for mitigation.

- **Cape Cod Climate Change Collaborative (CCCCC)**: APCC is a founding member of this Cape-wide collaborative modelled after the Paris Climate Accord to reduce greenhouse gases (GHGs). Works with major sectors (e.g., business, faith, transportation, environment, etc.) to reduce GHGs. Developed ***Action Plan for Net Zero.*** Next step is to plan implementation. Website: https://capecodclimate.org .

- **Clean energy**: APCC was the first environmental group in the U.S. to endorse Vineyard Wind. APCC also supported Cape Wind.

- **APCC position statements relating to climate change**: Visit https://www.apcc.org/positionstatements/index.html .

CAPE COD CLIMATE CHANGE COLLABORATIVE

Model Wetlands Bylaw for Climate Change Adaptation: Wellfleet Conservation Commission

Concerns:

- Eroding shorelines
- Coastal armoring
- Rising groundwater causes wetlands to expand
- Buffer strip and development
- Vulnerable areas and hot spots
- Allow for future salt marsh migration
- Tidally restricted wetlands
- Rare species habitat

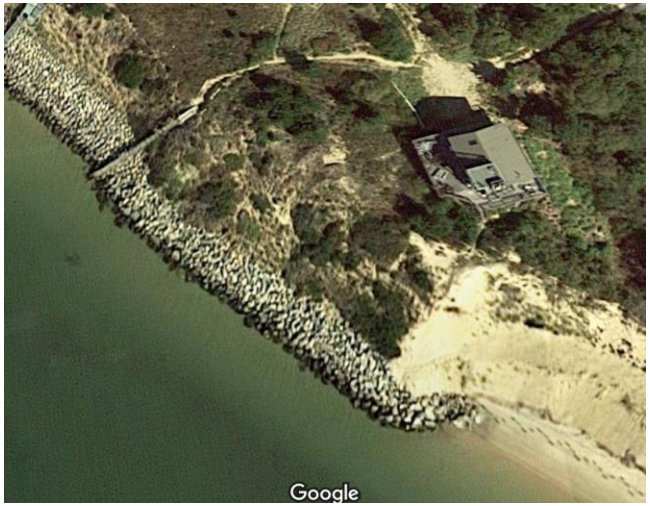
Herring River

Approach:

Develop a bylaw and regulations which will protect current and future resource areas and strengthen the ConCom's ability to protect these areas.

Examples to build on:

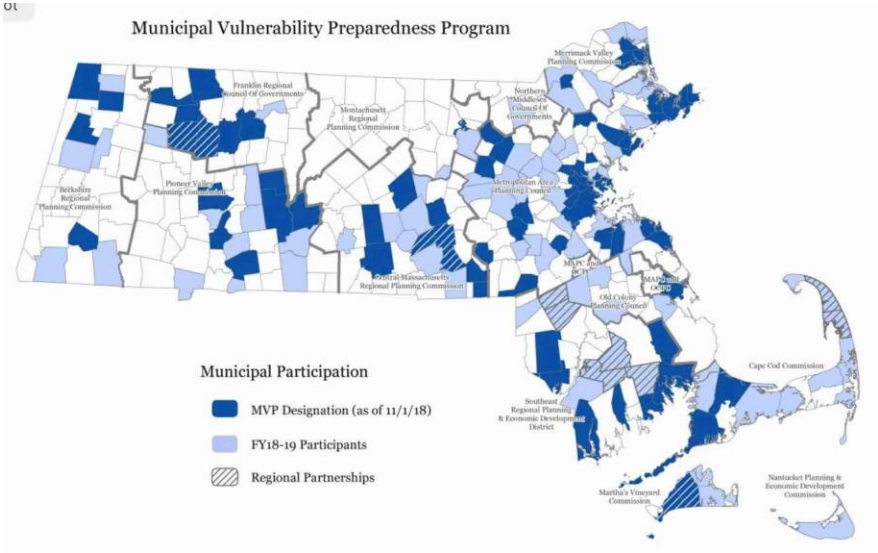
Boston, Hawaii ordinances (esp. Maui, Kauai erosion-based setback regulations)



Coastal armor and erosion

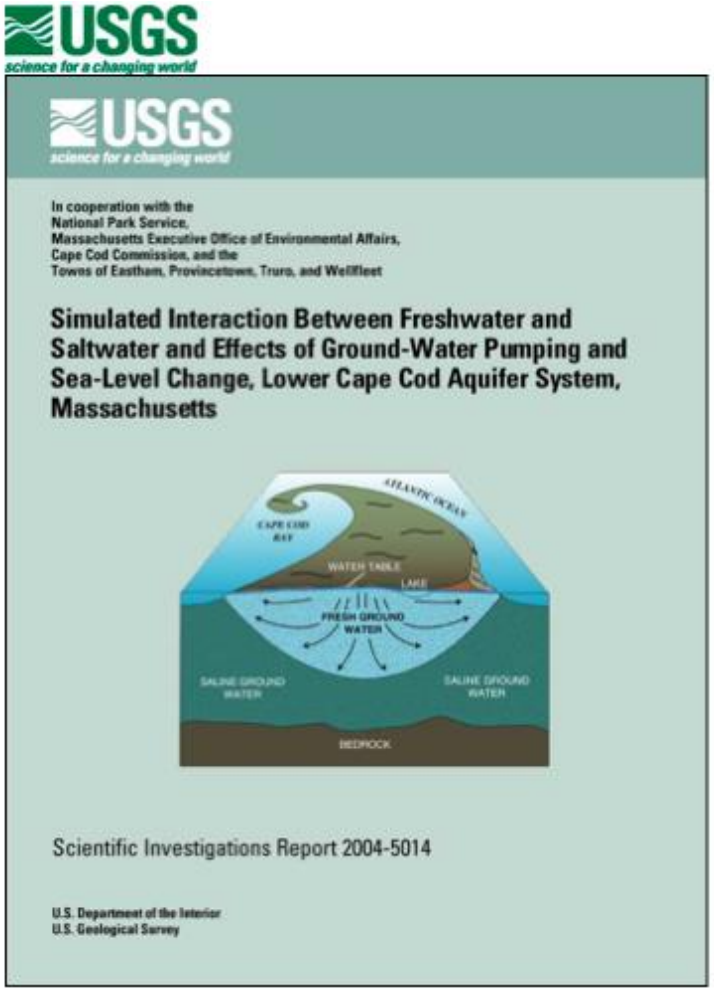
Planning

- **State Municipal Vulnerability Preparedness (MVP) Program**: Provides $ for municipalities to begin planning for climate change impacts and adaptation. Goal is to have all communities MVP-certified. APCC organized an MVP grant workshop, participated in towns planning sessions, and helped towns to apply for MVP grants. APCC is a certified MVP provider. Visit https://www.mass.gov/municipal-vulnerability-preparedness-mvp-program .



- **Resilient Cape Cod tool, Cape Cod Commission**: APCC researched methods of addressing coastal erosion, flooding, and adapting to sea level rise. Visit http://www.capecodcommission.org/index.php?id=631 . Note the Coastal Impact Viewer.

Science:
Evaluating the effects of sea level rise on Cape Cod's aquifer



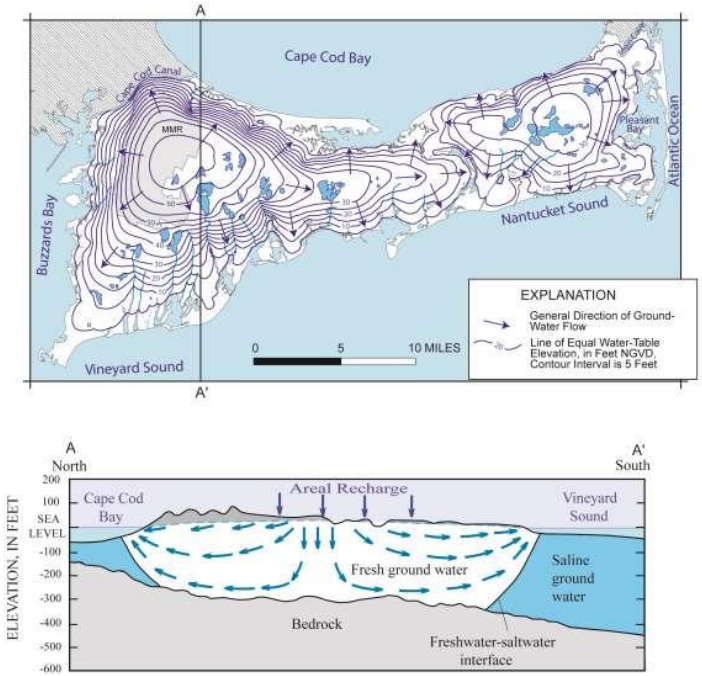


Figure 1. Top: the Sagamore (West Cape) and Monomoy (East Cape) groundwater flow lenses Cape Cod, Massachusetts. Bottom: North-South cross-section, AhA', tr o ugh te S gamore lns

MASSACHUSETTS ENVIRONMENTAL TRUST

Rising sea level will raise the water table, especially in low-lying coastal areas and near ponds and streams. These changes will impact septic systems, basements, roads, stormwater systems and other infrastructure, and could increase water pollution. Stream flow may increase. Changes in wetlands, streams and ponds may result.

APCC Salt Marsh Migration Study

Goal:

- Identify salt marshes which, if restored, could migrate inland as sea level rises;

Findings:

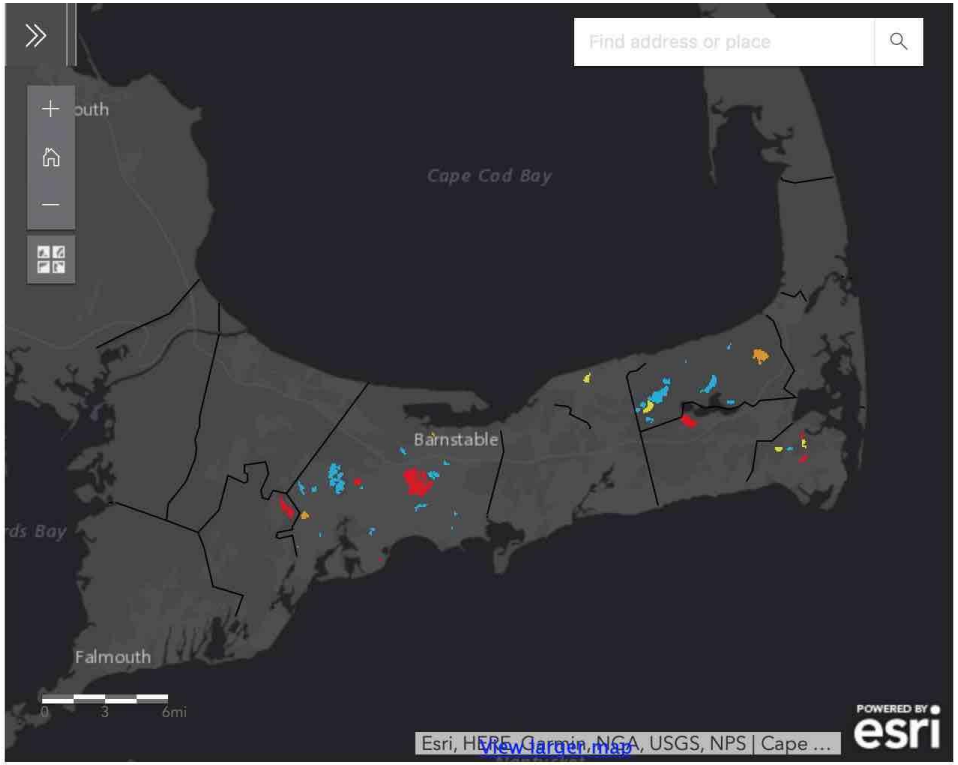
- 20 salt marshes identified and prioritized for restoration;
- More research is needed into salt marsh accretion, sedimentation, and new restoration methods;
- Low-lying open space at the heads of salt marshes should be preserved to allow for future migration.

Goal:

- Provide report cards on Cape Cod's water resources
- Motivate action to improve water quality
- Focus this year is on nutrients

Question:
Is climate change affecting our water quality?

Cyanobacteria Monitoring Program



Interactive map of current cyanobacteria monitoring locations. Visit https://www.apcc.org/cyano/index.html .

Goals:

- Monitor cyanobacteria in the Cape's ponds;
- Raise awareness of the ecological and public health risks from cyanobacteria;
- Motivate action to address causes (e.g., nutrients, stormwater runoff)

Question:

Does climate change have a role (storms, water temperature)?

Implementation:
Ecological Restoration

APCC's Restoration Coordination Center is working on ecological restoration projects in Falmouth, Barnstable, Brewster, Yarmouth, and Wellfleet, to restore salt marsh, fish runs and water quality.

Stony Brook culvert, 4' wide before restoration

After restoration, 18 feet wide

Resources

July 11, 2019: APCC is hosting a talk by Dr. John Holdren, Science Advisor to President Obama, entitled "Climate Change and Cape Cod: what do we know, what do we expect, and what should we do?" Chatham Community Center, 6:30 PM.

APCC's Climate Change webpage: includes a link to EPA climate change webpages which were preserved when they were deleted in 2017. Visit https://www.apcc.org/climatechange/index.html .

Northeast Climate Adaptation Science Center: Comprehensive resource for climate change adaptation science in the Northeast. https://necsc.umass.edu/about-us . Includes MBL.

MA Climate Change Clearinghouse: The state's go-to source for climate change information for Massachusetts: http://www.resilientma.org .

For more information, contact:

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Area of study: Mid-Cape groundwater

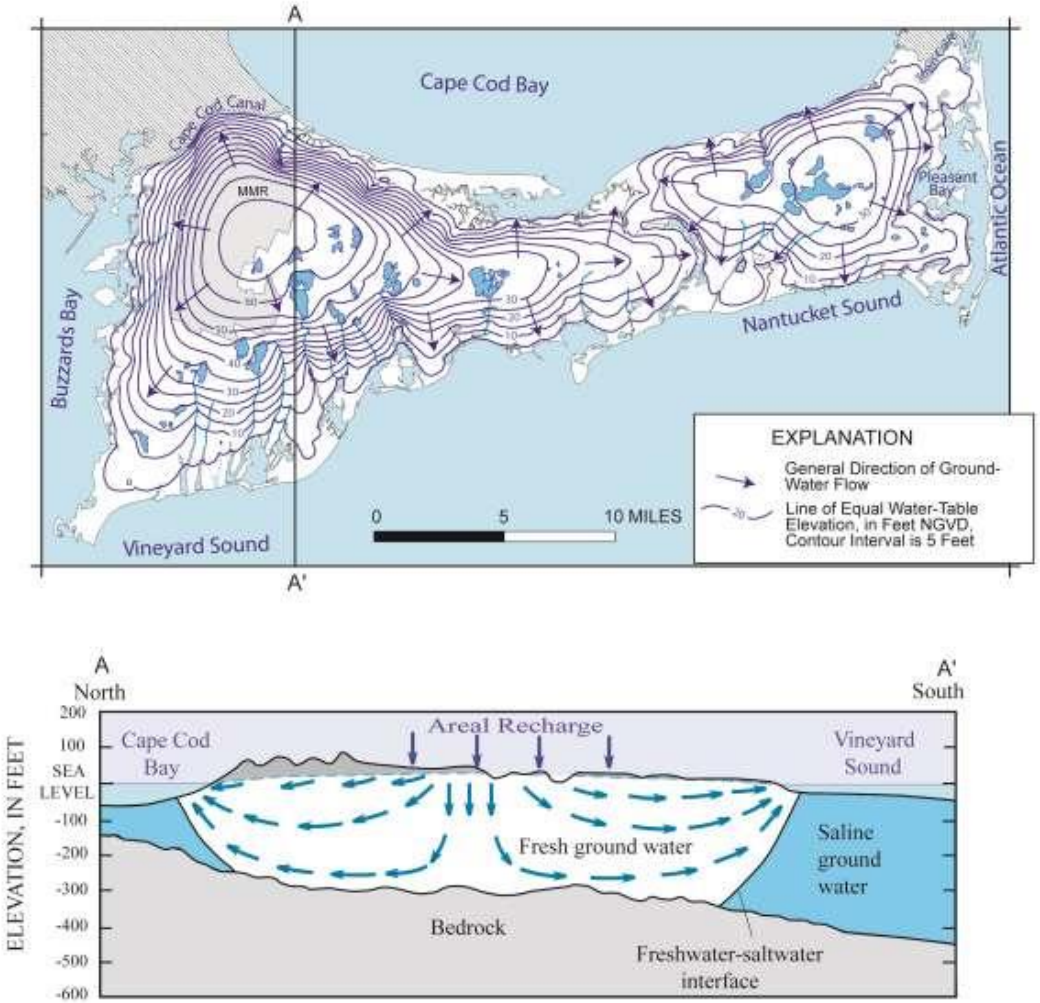

Figure 1. Top: the Sagamore (West Cape) and Monomoy (East Cape) groundwater flow lenses of Cape Cod, Massachusetts. Bottom: North-South cross-section, A-A', through the Sagamore lens.

Goals:

- **Model effects of future sea level rise on groundwater, water table, stream flows and freshwater-saltwater interface**
- **Evaluate impacts of changes on water bodies, wetlands, public water supplies, septic systems/wastewater management, stormwater management, and infrastructure**
- **Provide outreach**
- **Develop recommendations for adaptive measures**

Results

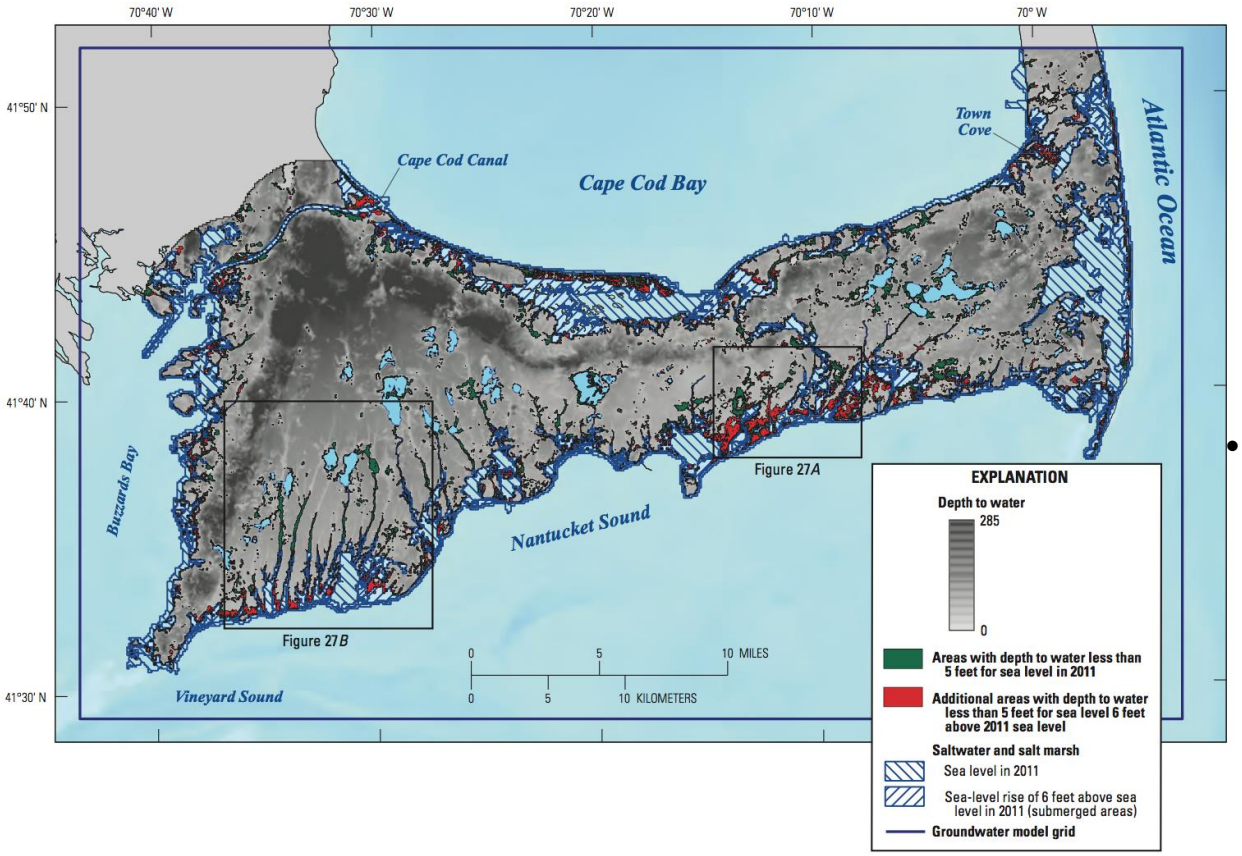

Figure 26. Depth to water resulting from a sea-level rise of 6 feet above sea levels in 2011 and areas with depths to water less than or equal to 5 feet for sea levels in 2011 and 6 feet above sea levels in 2011 in central and western Cape Cod, Massachusetts.

At 6 feet of sea level rise

- **Area of high groundwater (< 5' below the surface) will double, from 24.9 sq.mi. to 40.8 sq.mi.;**
- **Median groundwater elevation rises by 2.11';**
- **Septic systems and subsurface infrastructure will be inundated from below.**
- **Stream discharges will change:**
  - **Discharge may offset some of the increase in the water table;**
  - **Since the Sagamore lens has more stream discharges (47%) than the Monomoy lens (29%), the Sagamore lens may rise less;**
- **Public water supplies probably not affected;**
- **Private wells may be impacted.**