

# Cape Cod Freshwater Initiative

A science-based, information-driven planning process that engages stakeholders and enables action to protect and restore Cape Cod's freshwater ponds

[www.capecodcommission.org/freshwater](http://www.capecodcommission.org/freshwater)



CAPE COD  
COMMISSION

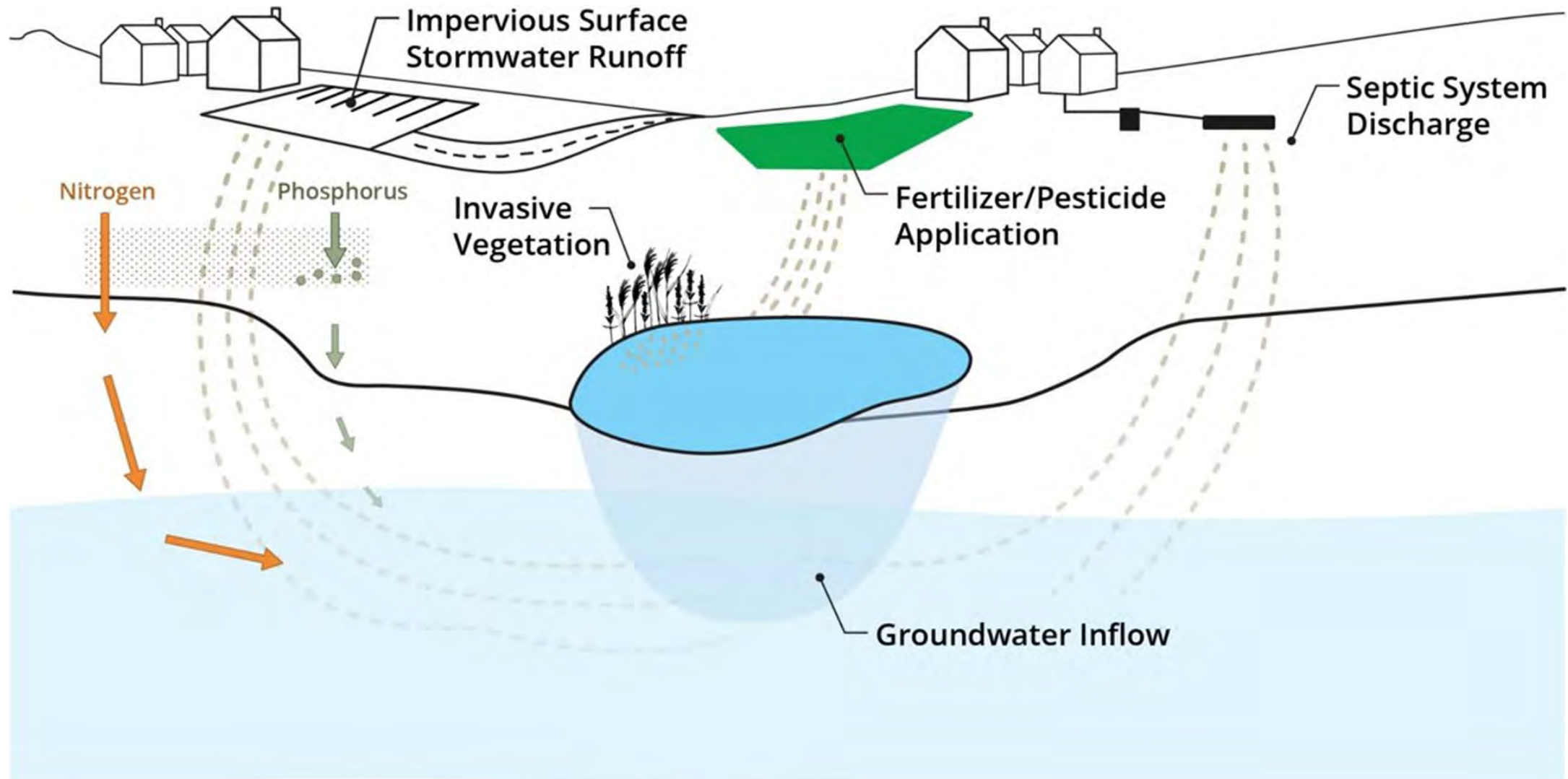


CAPE COD  
COMMISSION

# The Cape Cod Commission

...is the regional land use planning, economic development, and regulatory agency created in 1990 to serve the citizens and 15 towns of Barnstable County, Massachusetts

# Ponds at Risk



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## ESTABLISHING THE BASELINE

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Ponds And Lakes Atlas Update



Physical Characteristics



Data Management And Analysis



Remote Sensing

## STRATEGY DEVELOPMENT

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Engagement and Outreach



Strategies Database



Economic Analysis



Legal Analysis

## ONGOING MONITORING AND ANALYSIS

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Monitoring Program



Ongoing Data Management and Analysis



# FRESHWATER IMPACTS

**PONDS WITH BETTER WATER QUALITY LEAD TO INCREASED VISITATION AND HIGHER PROPERTY VALUES**

## 1.3 to 1.7 million

**Estimated visits to Cape Cod ponds and lakes annually**



Estimates based on intercept survey data collected at 96 freshwater public access points and foot traffic data using cell phone activity at ponds across the region.

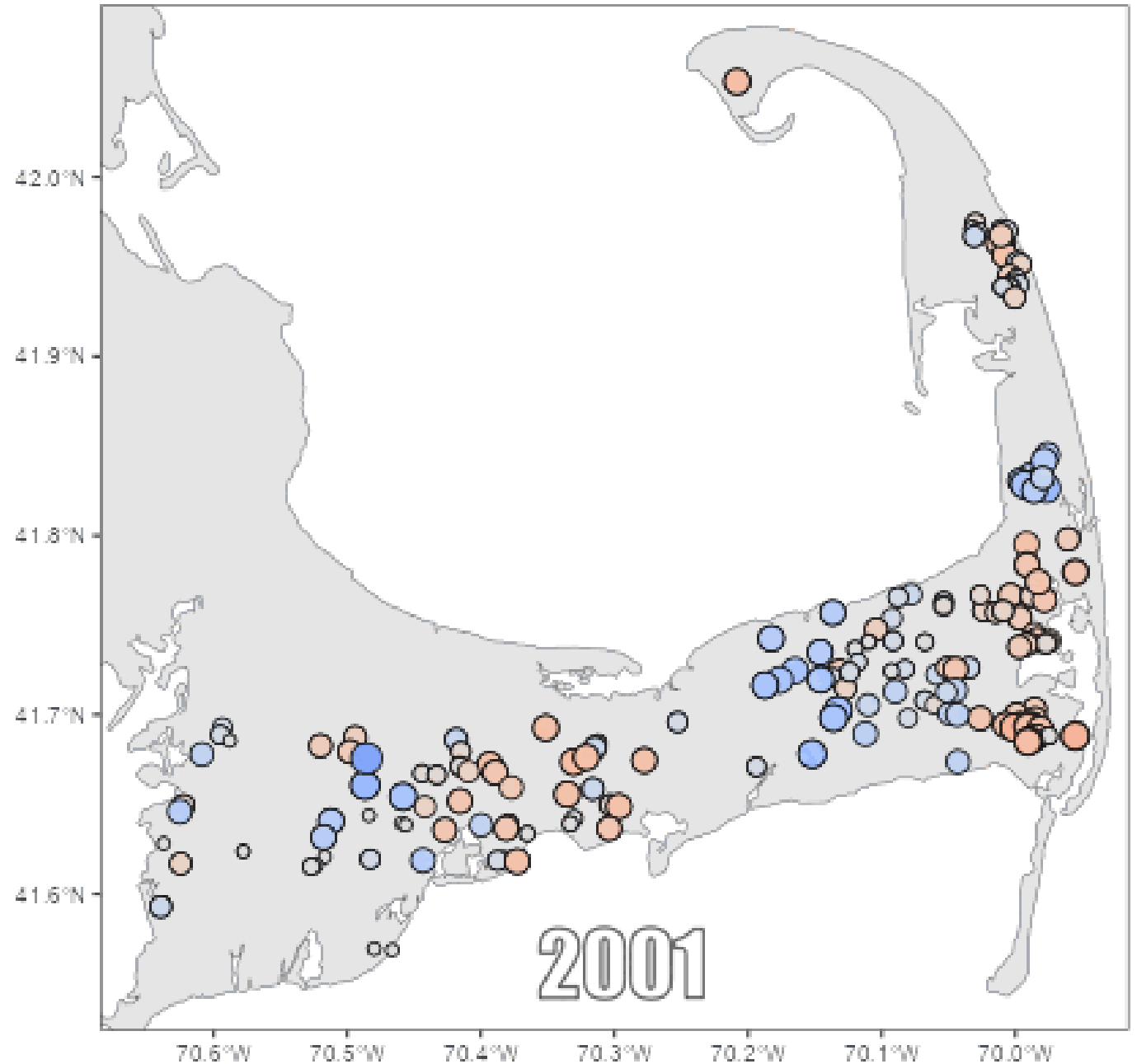


**Sales price premium for homes closer to ponds with better water quality**

Based on home sales from 2015-2022

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# History of Ponds Monitored 2001-2020



# Regional Pond Monitoring Program

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## First season of monitoring - 2023

- **50 ponds** monitored from April to Oct
- **346 pond** visits by staff and volunteers

## Monitoring efforts resumed March 2024

- **Expanded in 2024** - March through November to capture turnover events
- 118 pond visits through May 2024



# Data Management and Analysis

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Cape Cod Water  
Quality Database

Identify trend analyses and  
develop processing scripts

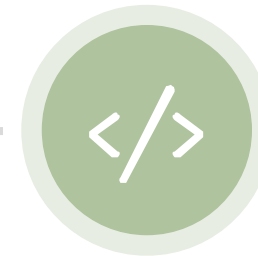
Release freshwater public  
data portal / user interface



ONGOING DATA MANAGEMENT AND ANALYSIS



Future  
monitoring data



Regional data and  
trend analysis

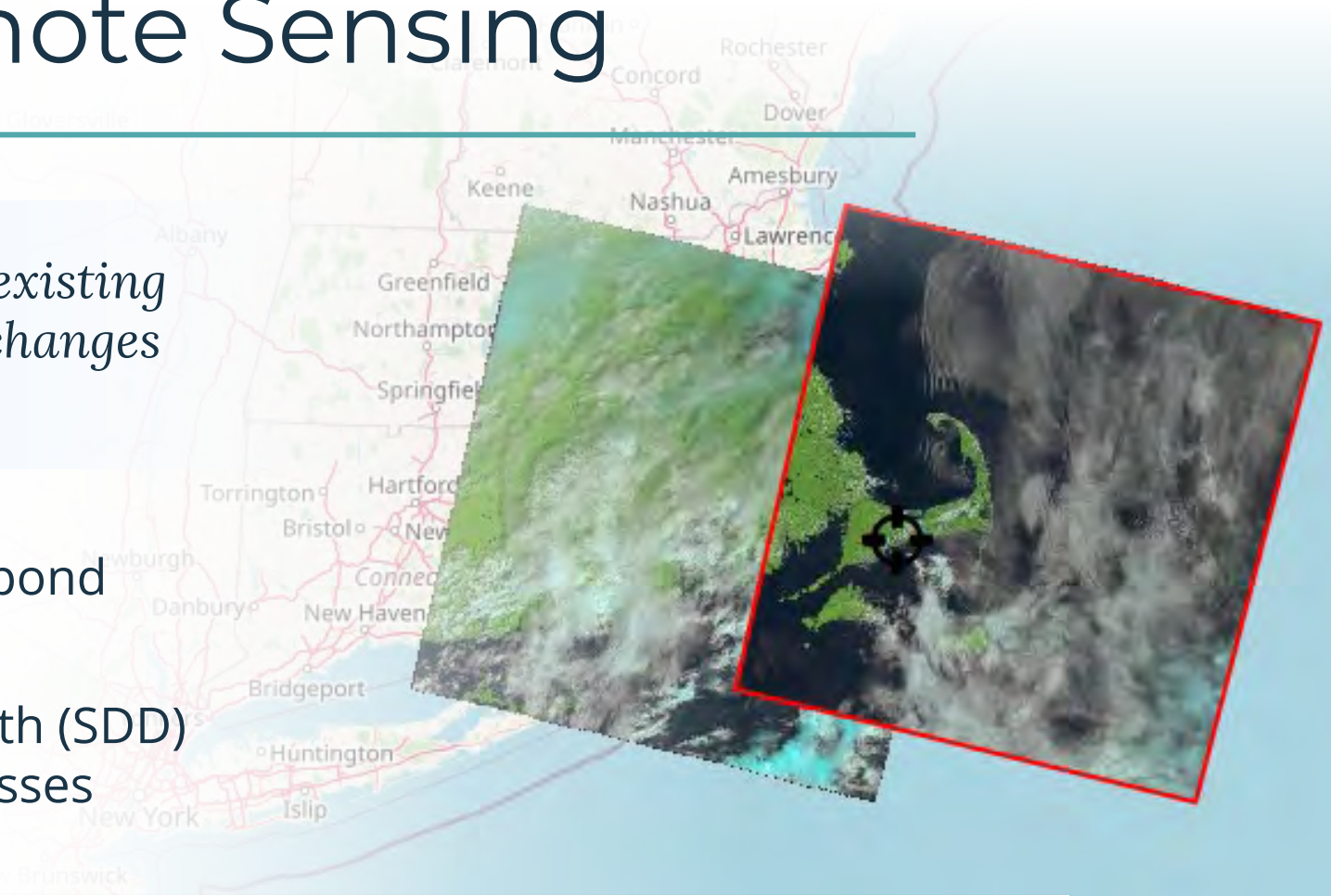




# Remote Sensing

*Using satellite-derived imagery and existing pond water quality data to quantify changes in pond characteristics*

- Connecting satellite imagery to pond water quality monitoring data
- Calibrating with Secchi Disk Depth (SDD) collected during satellite overpasses

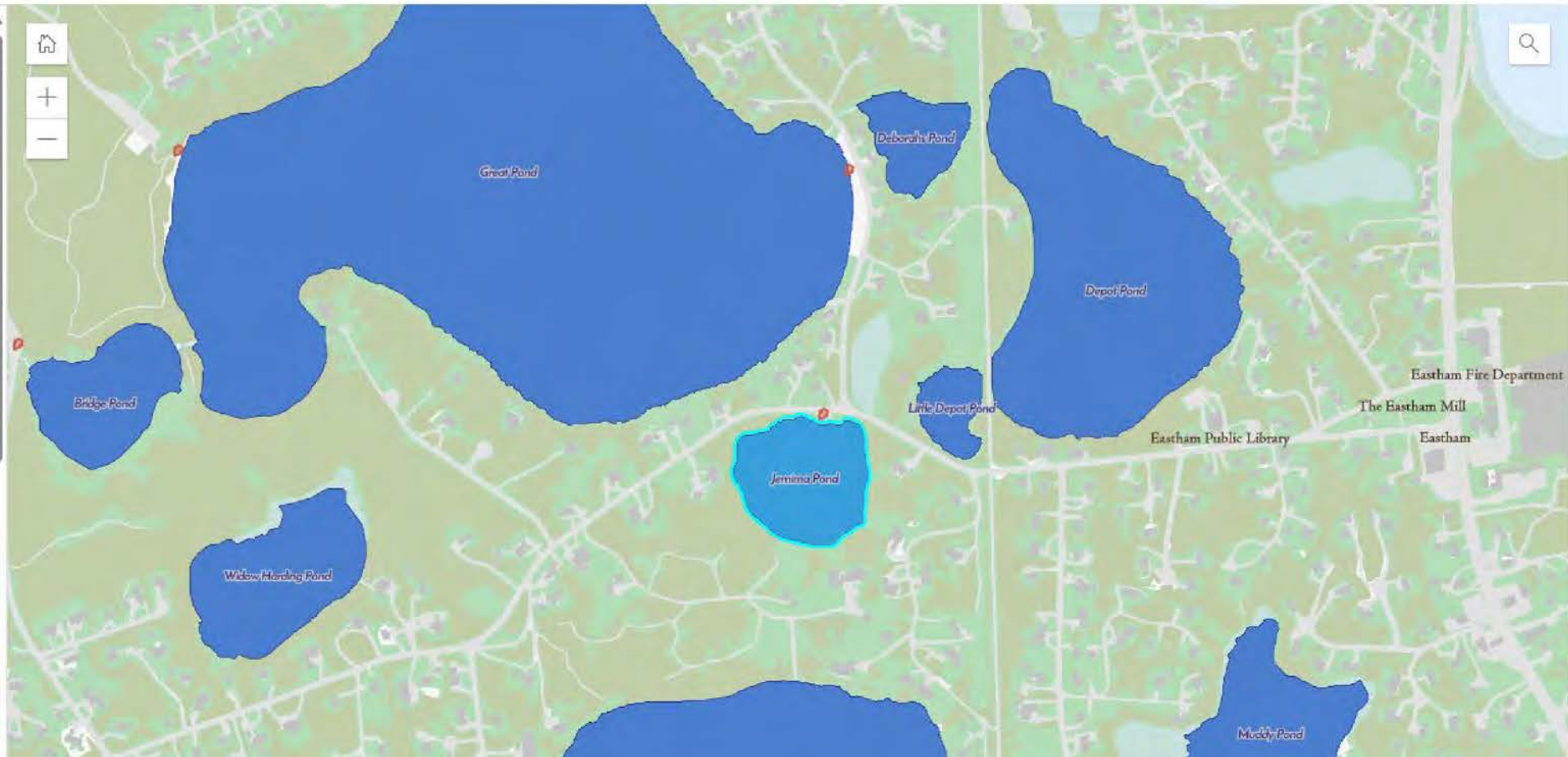


# Pond Atlas Viewer



## Jemima Pond

Alternative Name	
CCC-GIS-ID	EA-100
Town	Eastham
Village	Eastham
Acres	6.53
Maximum Depth (ft)	15.0
Great Pond	No
Watershed Delineated	Yes
Ponds stocked with fish	No
NHESP Natural Community	No
Percent Protected Open Space in Pond's 300ft. buffer	14%
Cranberry Bogs within 300ft Buffer	No
Golf Course within 300ft Buffer	No

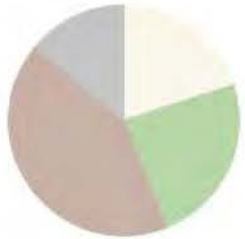


# Pond Atlas Viewer



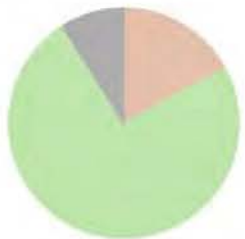
## Surrounding Landcover

what land cover is within 300 ft of the selected pond

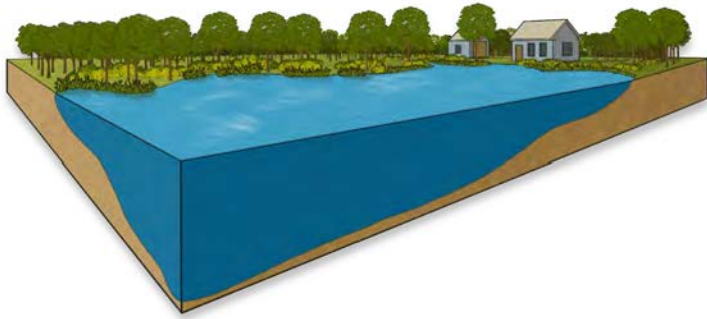


## Surrounding Landuse

what land use is within 300 ft of the selected pond

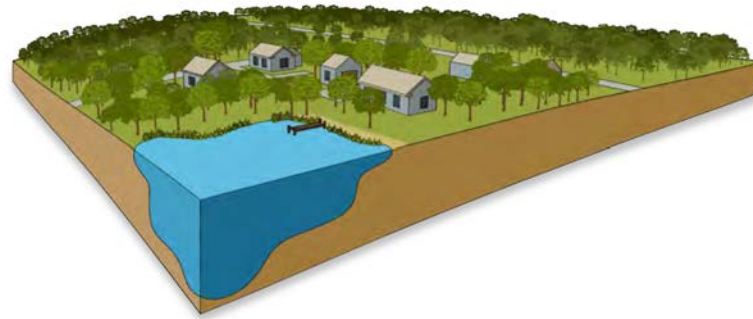


## SCALE OF APPROACHES



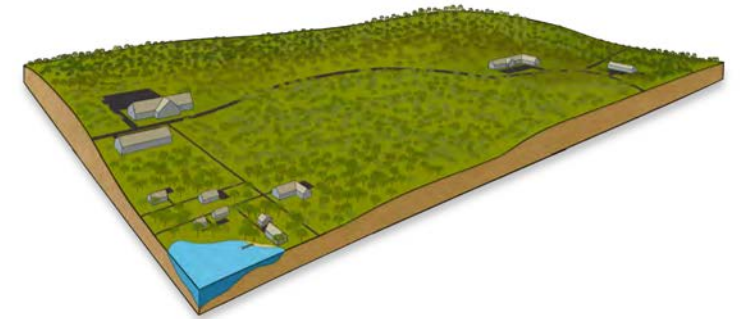
### IN POND

Sediment, nutrient, algae, and vegetation management approaches



### POND SHORE

Vegetated buffers, fertilizer management, septic setbacks, I/A septic systems



### WATERSHED

Comprehensive watershed planning, land use regulations, land protection, advanced wastewater treatment

THREATS  
ADDRESSED



Excess  
Nutrients



Pollutant  
Inputs



Algal  
Blooms



Erosion



Invasive/Nuisance  
Species

# 40 DRAFT STRATEGY FACT SHEETS

The image displays four draft strategy fact sheets, each with a distinct header and layout:

- Land Protection:** Focuses on Freshwater Pond Area Planning / Regulation. It addresses threats like Excess Nutrients and includes strategy goals for Protect and Manage. The description explains how land protection involves zoning and stewardship to prevent development near ponds.
- Benthic Barriers:** Focuses on Vegetation Management. It addresses threats like Excess Nutrients and Polluted Inputs. The description notes that benthic barriers are made of variable composition and placed on top of plants to filter pollutants.
- Permeable Reactive Barrier:** Focuses on Nutrient Management. It addresses threats like Excess Nutrients. The description explains that these barriers use reactive materials to break down contaminants in groundwater.
- Pondshore Buffer Plantings:** Focuses on Nutrient Management. It addresses multiple threats including Excess Nutrients, Polluted Inputs, Algal Blooms, Erosion, and Invasive/ nuisance Species. It lists co-benefits like Habitat, Aesthetics, and Recreation. The description details planting native plants in a buffer zone to prevent erosion and filter pollutants.

Each fact sheet includes sections for Strategy Goals, Duration of Benefits, Description, Advantages, and Constraints, along with a visual diagram of the strategy in action.

## MANAGEMENT APPROACHES

- Planning & Regulations
- Nutrient Management
- Sediment Management
- Algae Management
- Vegetation Management
- Fisheries Management



# STAKEHOLDER ENGAGEMENT

Stakeholder groups  
organized by groundwater  
lenses

## Outer Cape Lenses

Eastham,  
Wellfleet, Truro,  
Provincetown

PILGRIM

PAMET

CHEQUESSETT

NAUSET

## Sagamore Lens

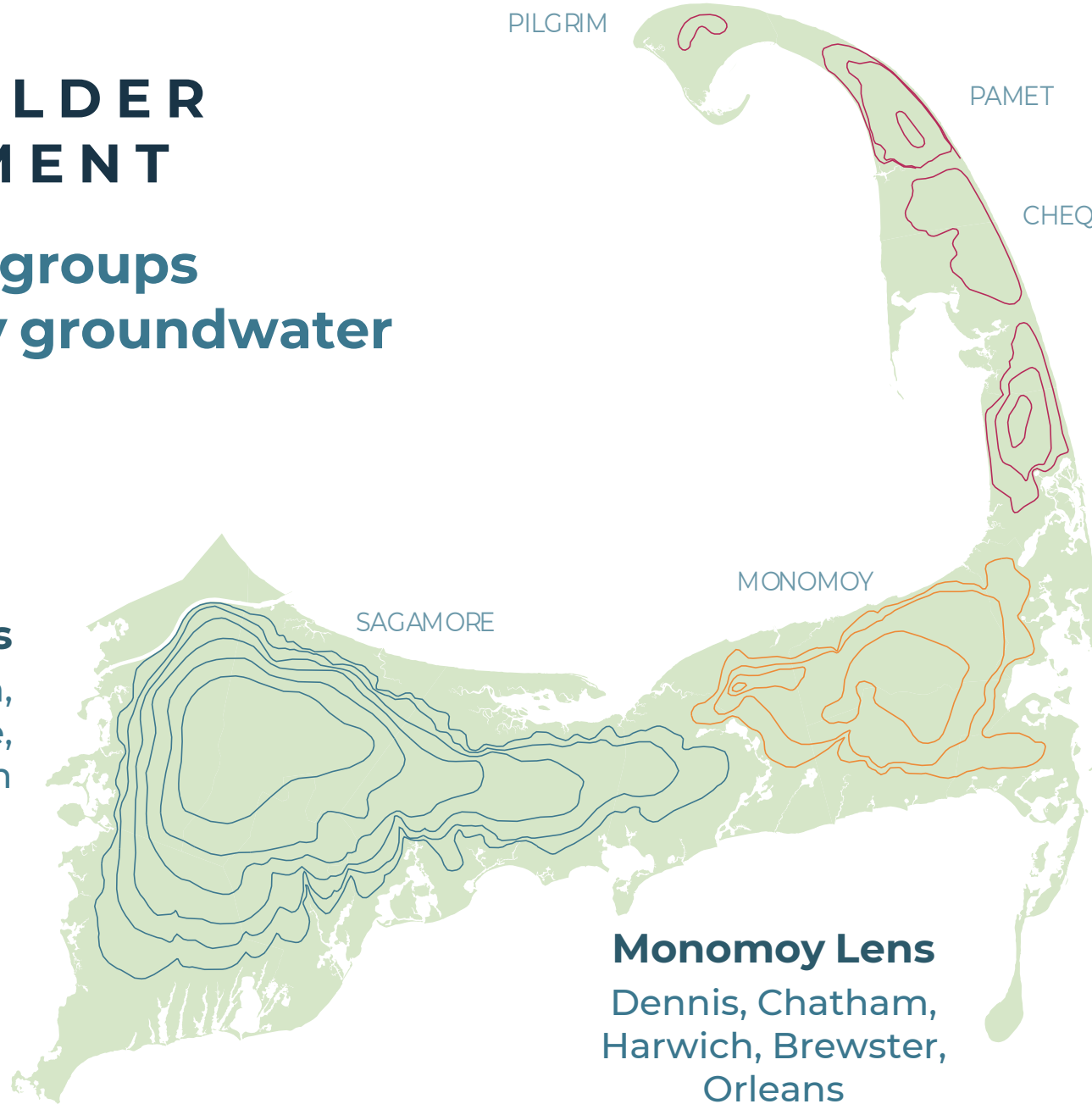
Bourne, Falmouth,  
Sandwich, Mashpee,  
Barnstable, Yarmouth

SAGAMORE

MONOMOY

## Monomoy Lens

Dennis, Chatham,  
Harwich, Brewster,  
Orleans



# Cape Cod Freshwater Initiative Collaboration CCC and CCNS

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Data Sharing



Pond data portal development



Remote sensing



Strategies Technical Advisory Group

# Groundwater Resources

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## QUANTITY

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- Plenty of water in the lenses
- Difficult to access without impacts to surface waters
- Consider saltwater upconing

## QUALITY

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- Septic systems, stormwater, fertilizer impacts
- Management through CWMPs; sewers, IAs, and other
- (public water supply helps address N from septic)

## SEA LEVEL RISE

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- USGS study: Public supply wells OK
- Private wells near coast may be impacted



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Contact Heather McElroy  
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