

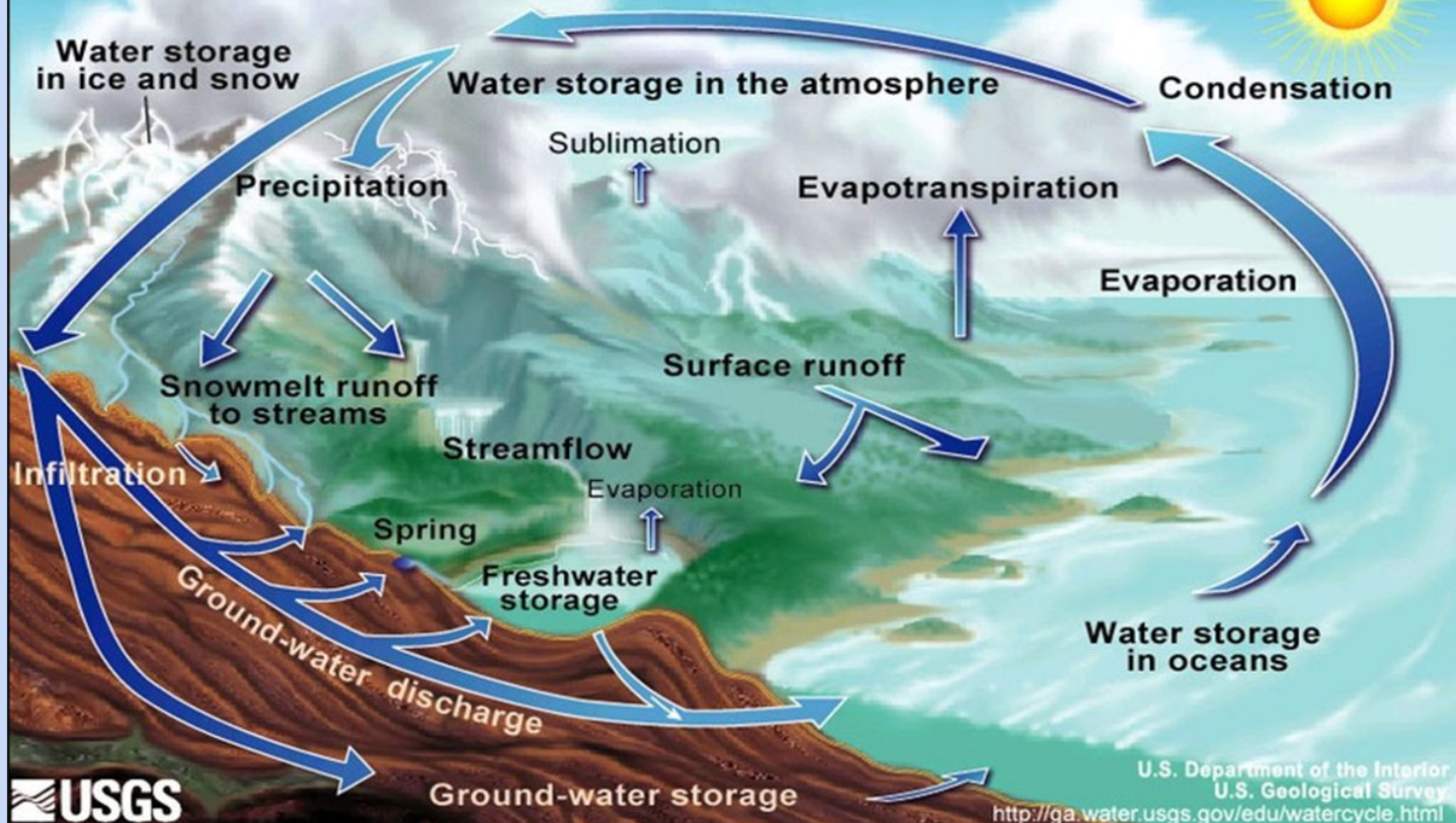
Long Island Groundwater Sustainability Study 2024-25



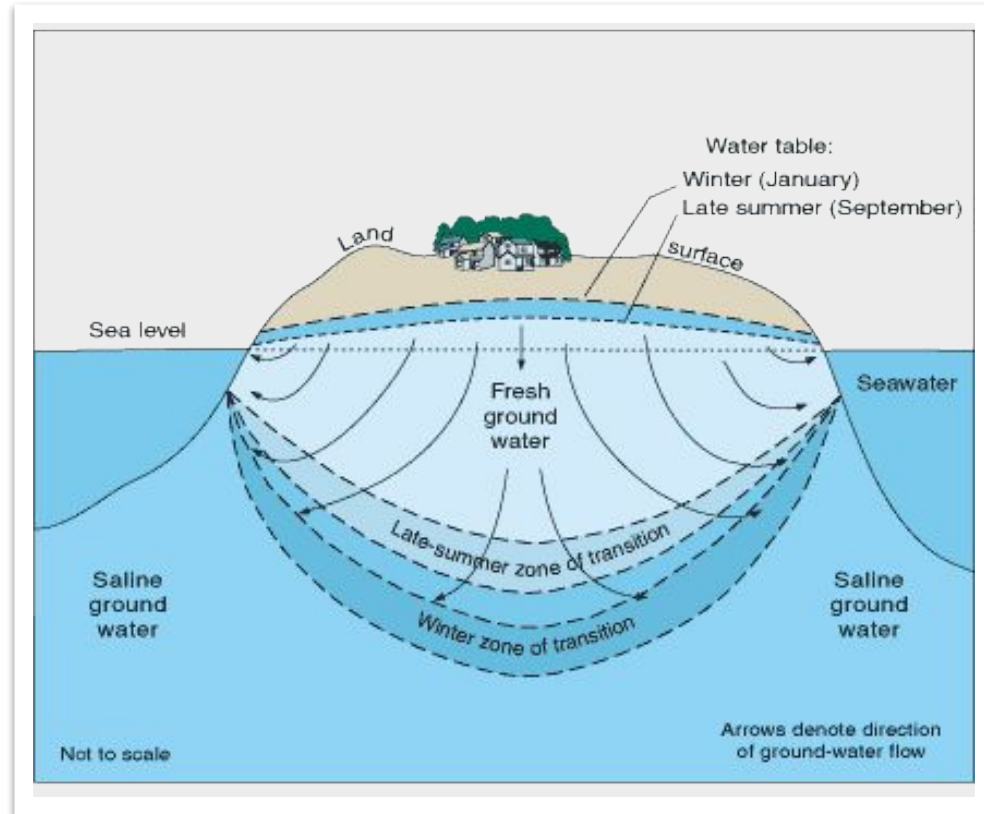
Agenda

- Groundwater 101
- Impacts of Climate Change
- The 1986 Gerber Report
- 2024 Groundwater Sustainability Study
 - a. CRP Community Action Grant
 - b. Well and Septic Survey
 - c. Water Sampling
 - d. Next Steps

The Water Cycle



Freshwater- Saltwater Environments

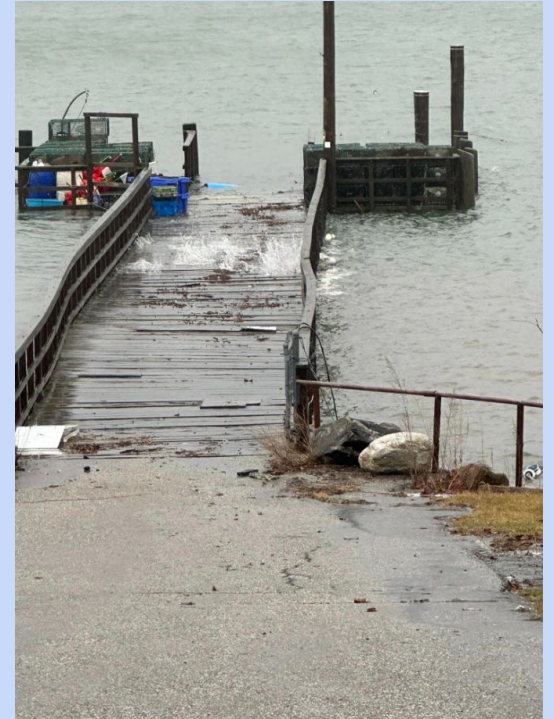


Impacts of Climate Change

- More intense rainfall events and runoff
- Reduced snowpack
- Sea level rise
 - Saltwater intrusion
 - Increased precipitation can also accelerate coastal erosion (i.e bluff land loss)

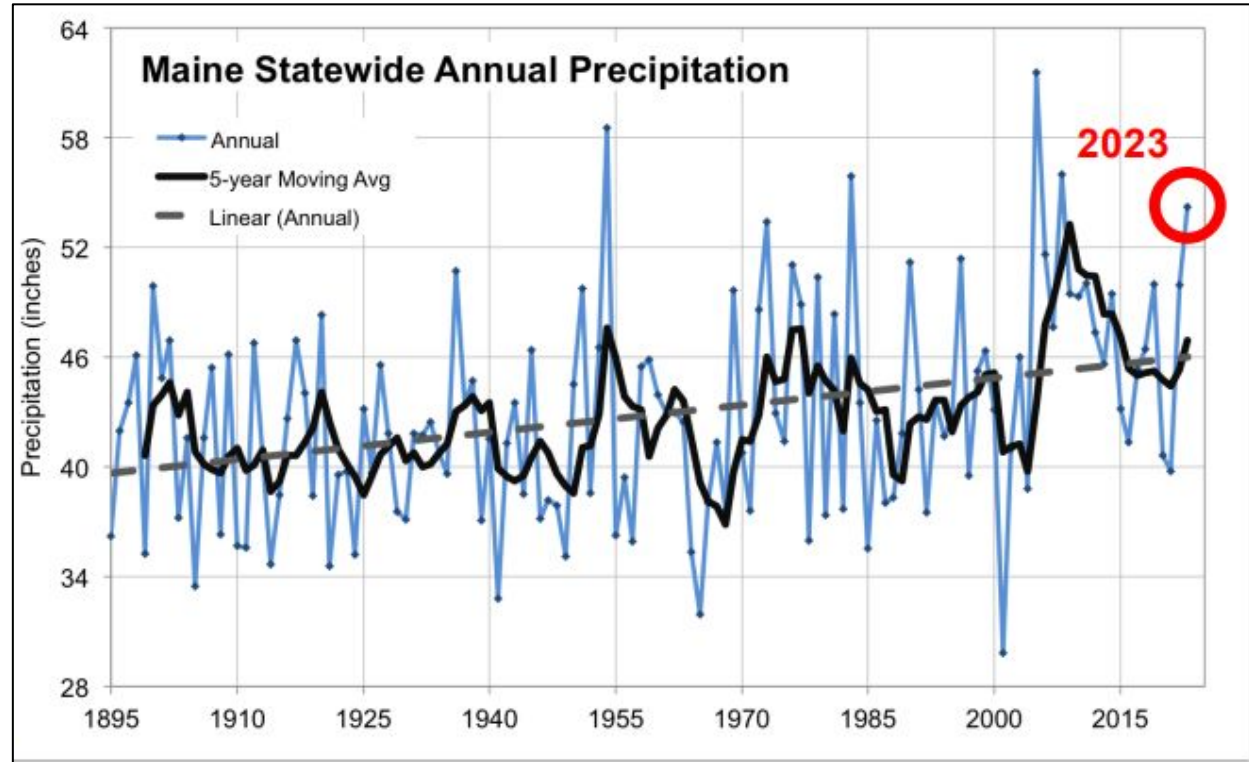


Bluff erosion;
view from
front beach.

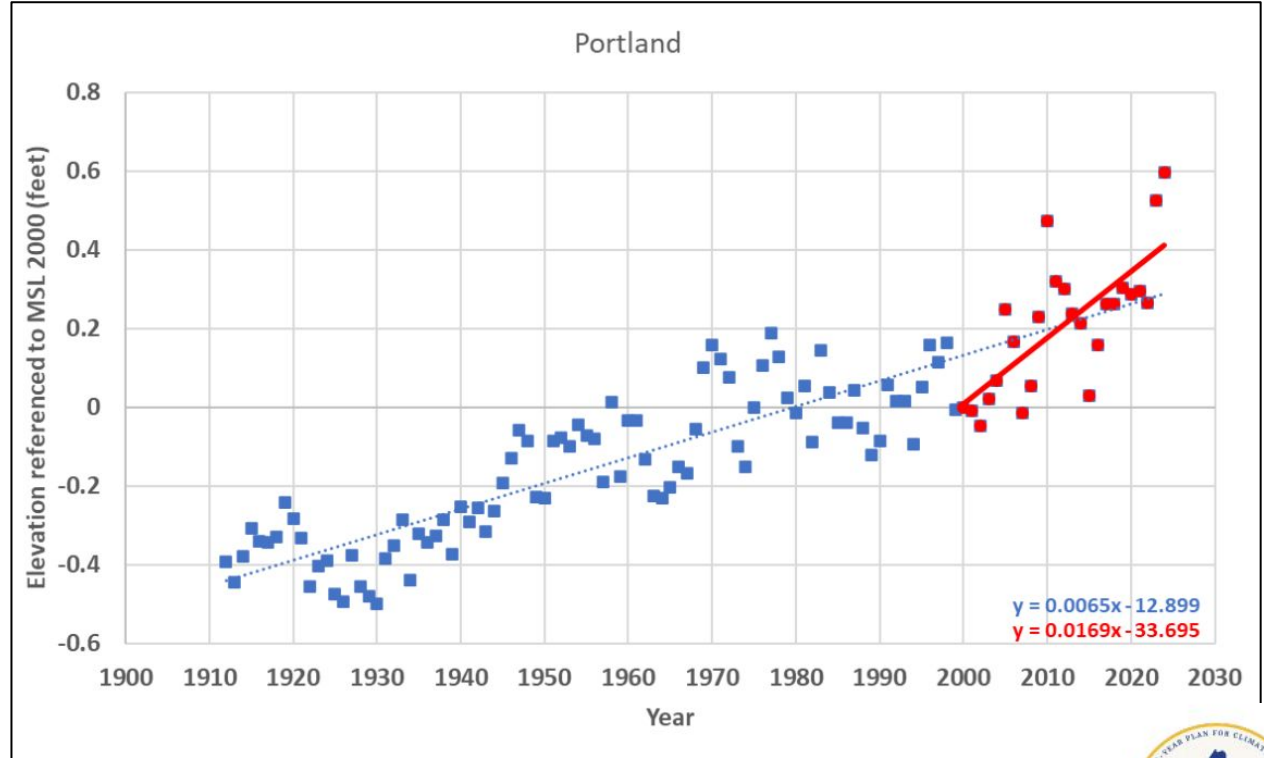


Storm damage from January 2024
storm on Long Island.

- Annual increase of about 6" since 1895
- Heavy precipitation >2" per day is becoming more common
- Projected 5-14% annual rainfall increase by 2100 and more frequent intense rainfall events



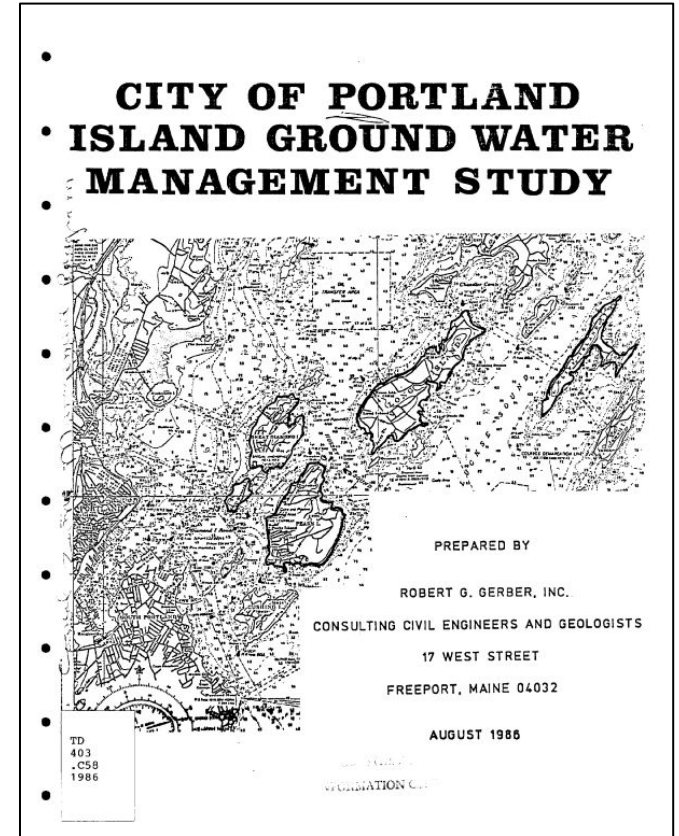
- The rate of sea level rise has increased by about 2.5x over the past 23.3 years (2.0 inches per decade)
- 2024 has set coastal flooding records, exacerbated by sea level rise



The Gerber Report- 1986

- **Objectives:**

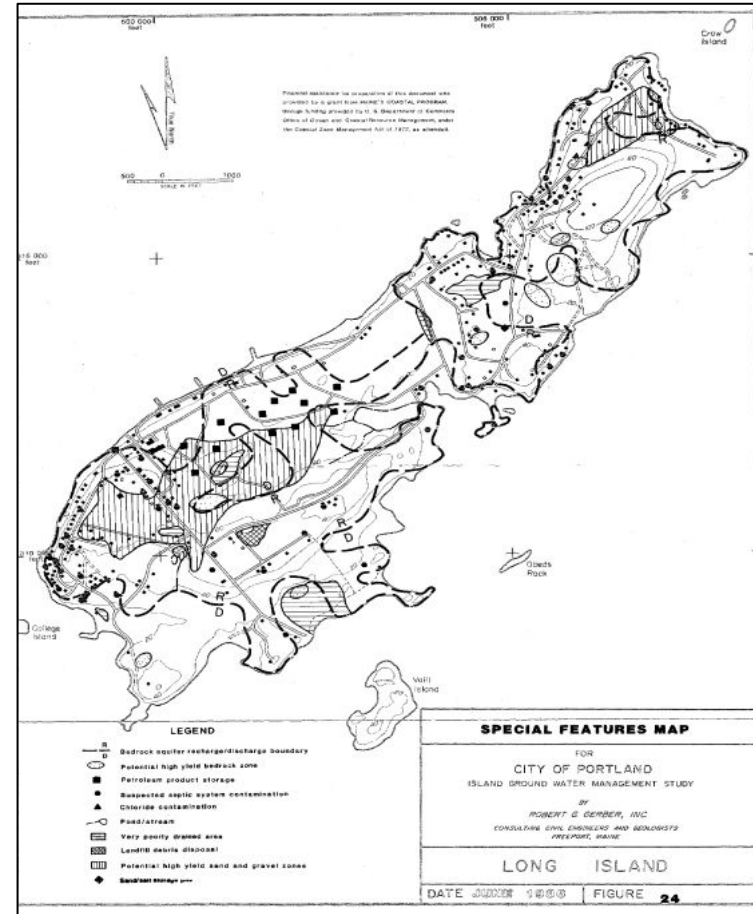
- a. Collect groundwater resources data
- b. Develop models to describe groundwater movement and origins
- c. Locate known and potential sources of groundwater contamination
- d. Propose management goals and implementation recommendations



The Gerber Report Findings

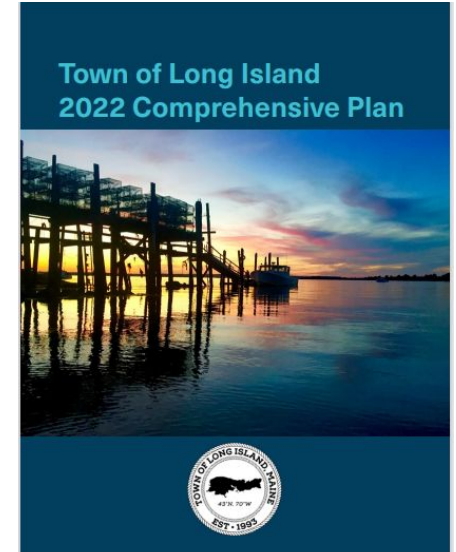
- In 1985, 104 of the wells on the island were tested more-or-less simultaneously for common health and esthetic related water quality parameters
- Results:
 - Almost half the wells tested had some total coliform bacteria
 - Over 1/3 of the wells had nitrate nitrogen concentrations significantly above what would be typical of uncontaminated groundwater
 - Very few cases of reported salt water intrusion in the island wells
 - Some local chloride contamination may be due to road salting or sand/salt storage

- High densities of subsurface sewage disposal systems and/or malfunctioning systems may have caused degradation of groundwater.
- On the “Special Features” map, the report identified sections of Long that might be vulnerable to septic system impacts



2022 LI Comprehensive Plan

- Water testing and protecting the water supply was identified as a top concern in the LICP2035 Survey
- Historical context:
 - “During the late 1890s and early 1900s, Long Island was hit by a limited real estate boom, whereby large sections of the island were subdivided into very small lots with many streets laid out with geometric precision. Many of these lots were built on lots too small to conform to present day land use standards (6).”
 - Point source pollution due to the history of tanks on island



Community Resilience Partnership: Community Action Grant

- The Town of Long Island Groundwater Sustainability Study
- Awarded \$45,400 for the project
- Objectives:
 - Collect and analyze data on the current state of the island's groundwater
 - Develop recommendations for next steps and implementation of a long-term climate resilience strategy

Components of Awarded Grant/ Water Study

Task 1: Data Collection and Compilation

- Well and Septic Survey
- Inventory and map existing wells
- Water Quality Testing
- Map and describe Long Island's Aquifer

Task 2: Water Balance and Carrying Capacity

- Provide a conceptual framework for understanding the island's groundwater aquifer and assessing its capacity to support development

Task 3: Future Applicability and Implementation

- Provide a conceptual framework for understanding the island's groundwater aquifer and assessing its capacity to support development

Task 4: Community Engagement

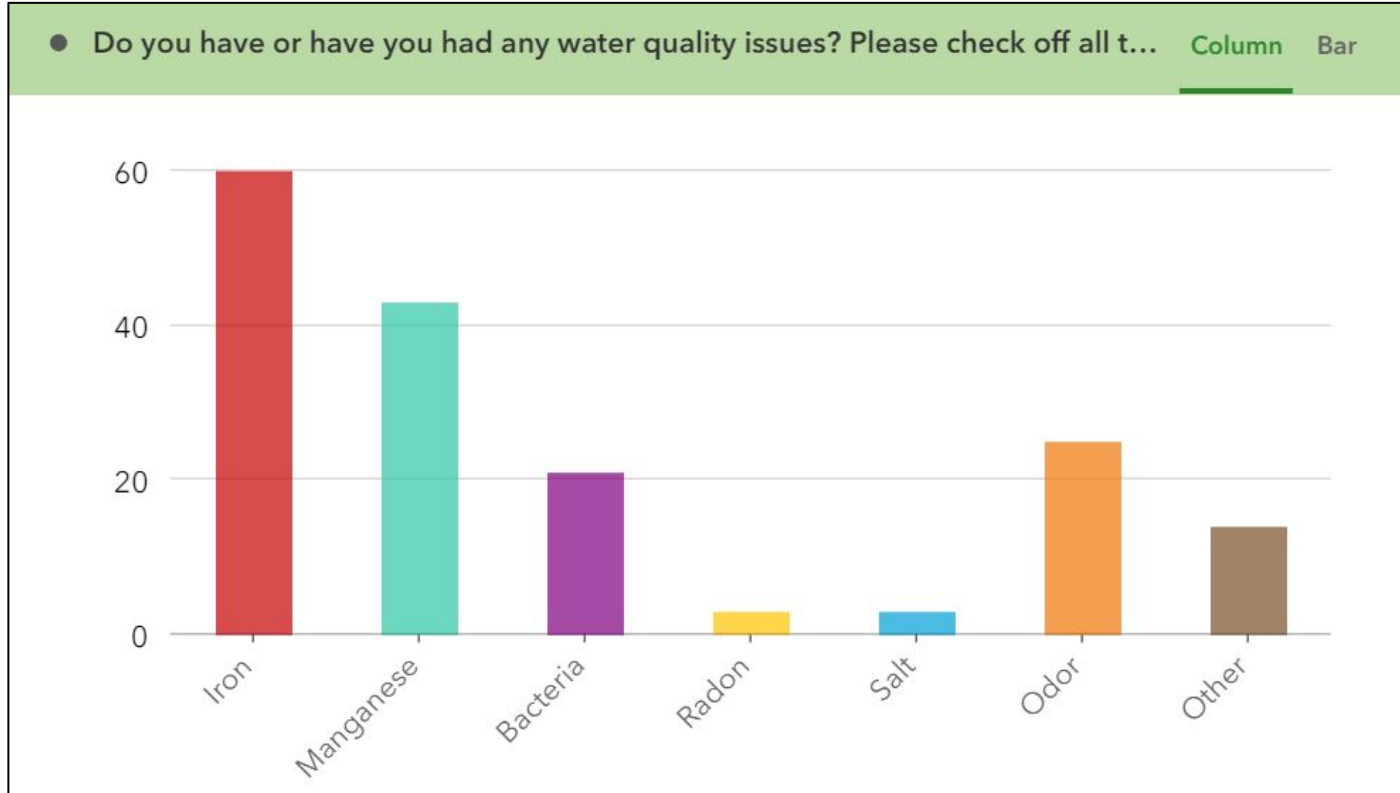
- Provide printed literature, online project updates and announcements, and community forums
- Facilitate and encourage dialogue between community members and project managers to best inform project tasks and goals

Well and Septic Survey

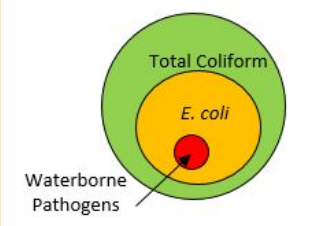
- Goals:
 - Update town data
 - Promote water testing program
- Results
 - 154 responses
 - Mapped well locations with Survey123
 - Recorded data on well history, water quality concerns, water usage, water treatment, and septic systems



Water quality concerns noted in survey responses



Water Sampling: Testing Parameters

Total Coliform	<ul style="list-style-type: none">• It's not practical to test for the numerous species of pathogenic bacteria that can be found in the environment. Instead, the potential presence of pathogens is determined with indirect evidence by testing for an "indicator" organism such as coliform bacteria
E. coli	<ul style="list-style-type: none">• A subgroup of Total Coliform bacteria• The detection of E. coli bacteria in your water sample means there's a chance that human waste or sewage, or animal waste may be impacting your well. 
Chloride	<ul style="list-style-type: none">• Occurs naturally in most ground water from small amounts which dissolve out of minerals in the soil and rocks.• Slightly elevated levels occur naturally in coastal areas due to air-blown marine spray.• High levels are usually associated with contamination by human activities, including saltwater intrusion, road salt storage/use, septic systems, etc.

A BIG thank you to our sampling volunteers!

- ~86 hours of sampling conducted
- ~122 hours total including transport to ME Environmental Laboratory in Yarmouth
- Sampling to date: over \$5,000 was spent on water testing at no cost to the community

Linda and Dennis McCann

Nancy Berges

Doug McCown

Brad Brown

Jane Conley

MaryAnn Pearsall

Joe Massaua

Michael Jozokos

Jon Seamans

Janice Avignon

Christian LaMontagne

Next Steps

- Analyze this summer's data
- Continue to gather data this winter and beyond
- Produce guidelines and recommendations with the help of experts
- Join forces with LICPIC: climate committee
- Recruit interested people to help finish the project

Water Quality Test Results

Bacteria

Total coliforms 49%

Escherichia coli 14%

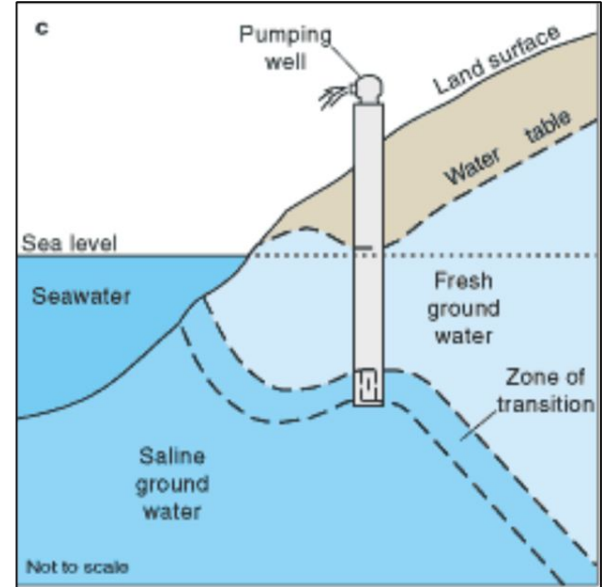
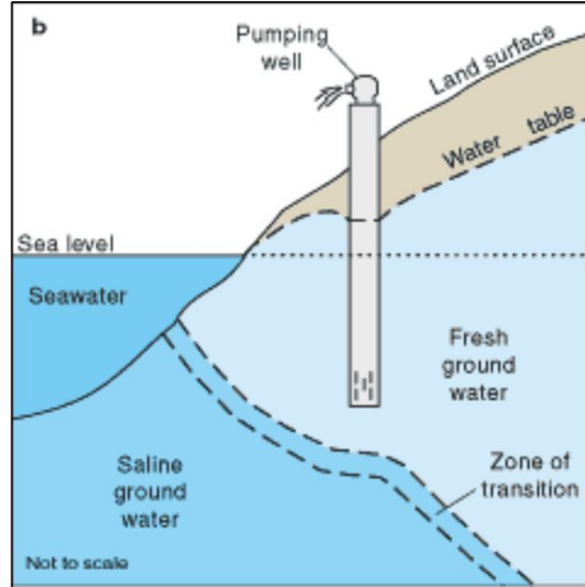
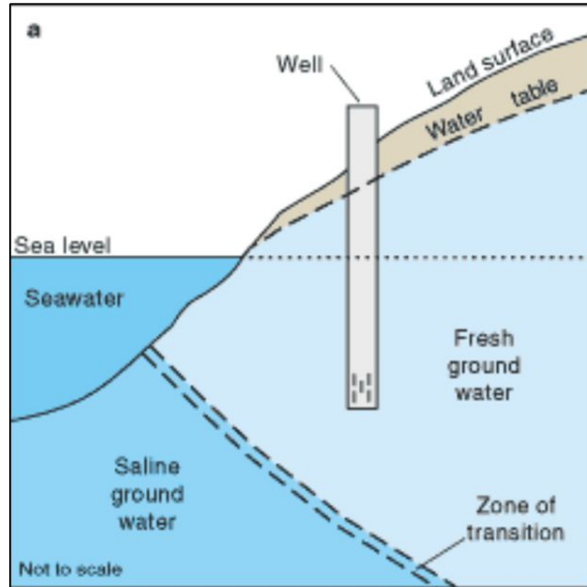
Chloride

Range Detected 1 to 190 mg/L

Median 20 mg/L

Average 30 mg/L

Potential Impacts from Overpumping



Fractured Bedrock Aquifers

