



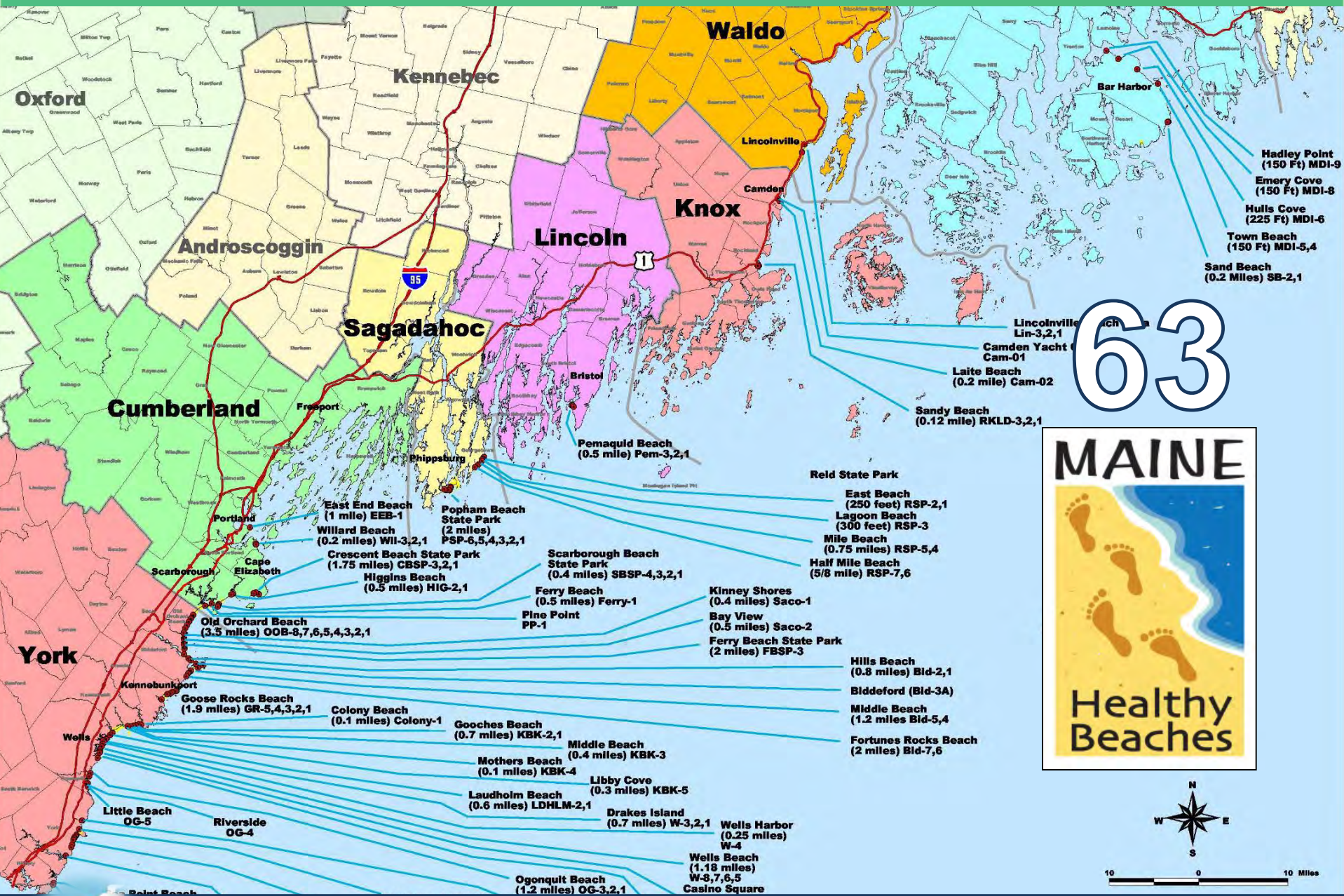
Tackling Persistent Bacteria Sources in Kennebunkport's Goose Rocks Beach Watershed

Meagan Sims

Maine Healthy Beaches Program

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

Protecting Maine's Air, Land and Water



Monitoring, Assessment & Notification

Welcome! This beach is part of the Maine Healthy Beaches Program.



Bacteria levels are routinely monitored for your safety and health



Think Healthy. Act Healthy. Swim Healthy.

Symptoms of water-related illnesses can include stomachache, vomiting, diarrhea, and infections of ear, eye, and skin. If you have any of these symptoms within seven days of swimming and suspect they were due to water contact at a Maine Beach, notify your physician and contact the Maine Department of Health & Human Services (800) 821-5821. Risk of illness may be greater for people with compromised immune systems. Water quality can change unexpectedly. Swim at your own risk.

MaineHealthyBeaches.org



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CONTAMINATION ADVISORY



Bacteria levels may be unsafe. Water contact is not advised.



RAINFALL ADVISORY

Rainfall can increase bacteria levels. Water contact is not advised.



Beyond Routine Beach Monitoring

Assess risk

Evaluate existing impairments

Establish collaborative partnerships

- EPA, Universities, etc.

Build local capacity to identify & address pollution

VII. RAM Final Score	
<hr/>	
Section Total Points	
I. Beach <u>history</u> (+)	_____
II. Human <u>wastewater</u> (+)	_____
III. Freshwater inputs (+)	_____
IV. Domestic animals/wildlife (+)	_____
V. Beach activities and characteristics (+)	_____
<hr/>	
Subtotal Sections I-V	_____
<hr/>	
VI. Actions to improve/protect water <u>quality</u> Subtract Points (-)	_____
<hr/>	
Final Score	<input type="text"/>
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Beyond Routine Beach Monitoring

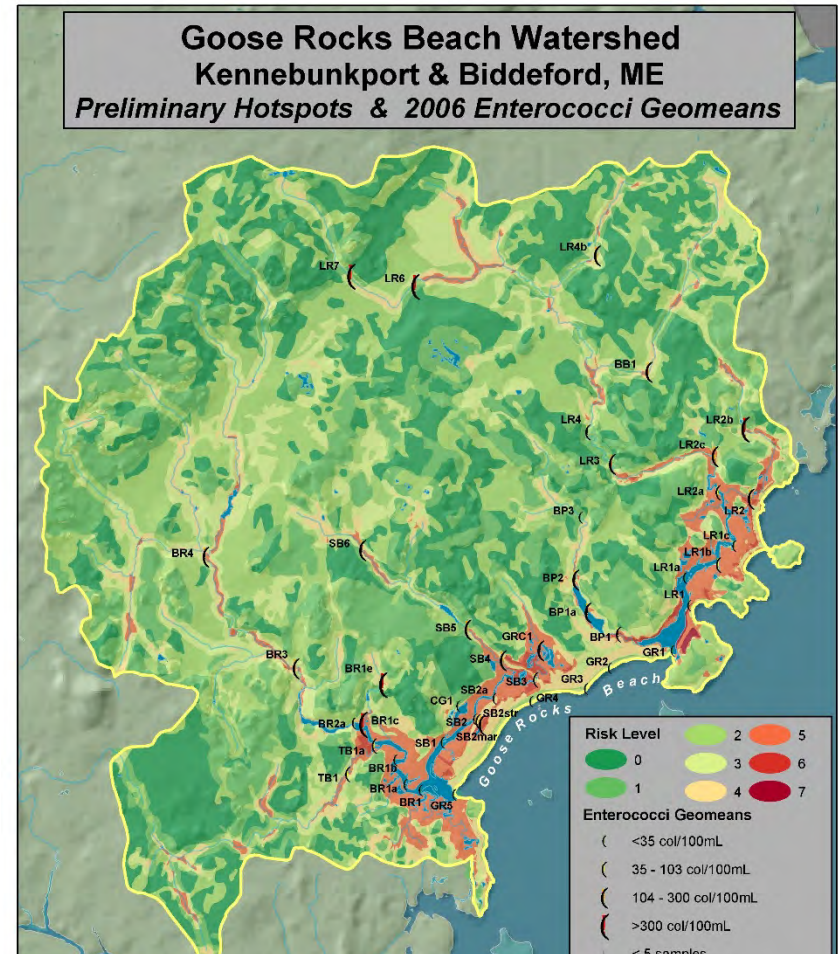
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Beyond Routine Beach Monitoring

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Build local capacity to identify & address pollution

Town of Kennebunkport

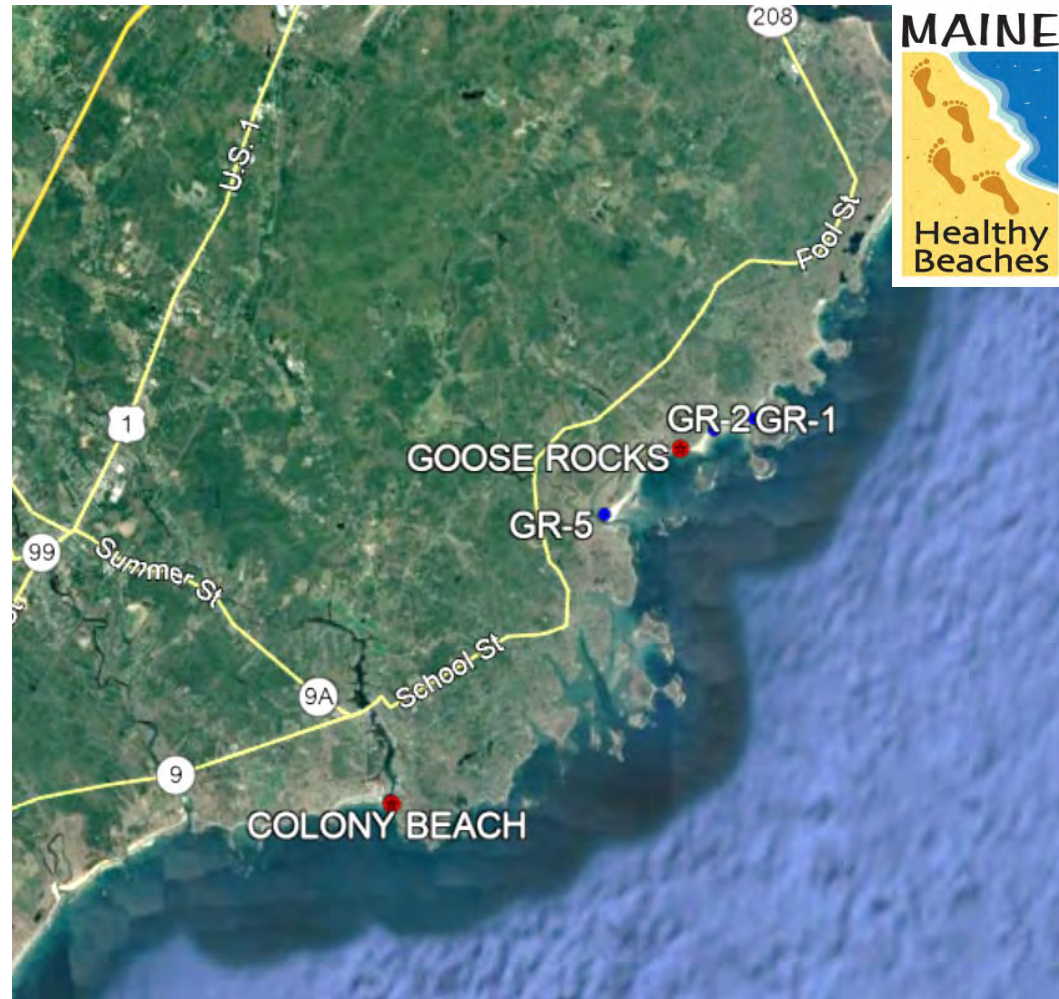
Joined in 2004

Beaches

- Colony
- Goose Rocks

Monitoring (Tier 1)

- Increased frequency 2018



Beach Monitoring



The Problem

Frequent beach
exceedances

Threaten public health

RAINFALL ADVISORY



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Goose Rocks Beach

Economic Asset

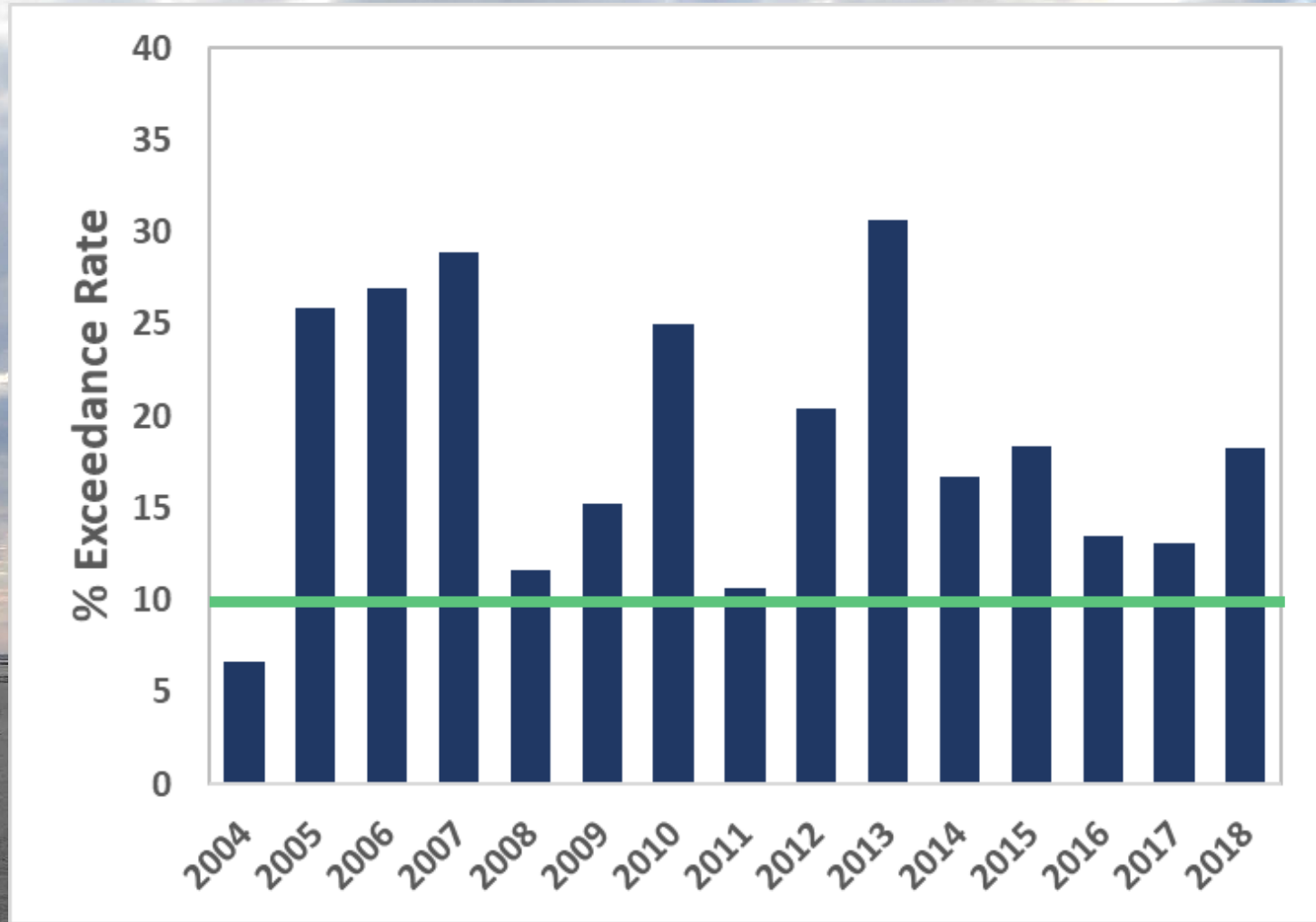
2018 Beach Stickers
= **\$137,849**



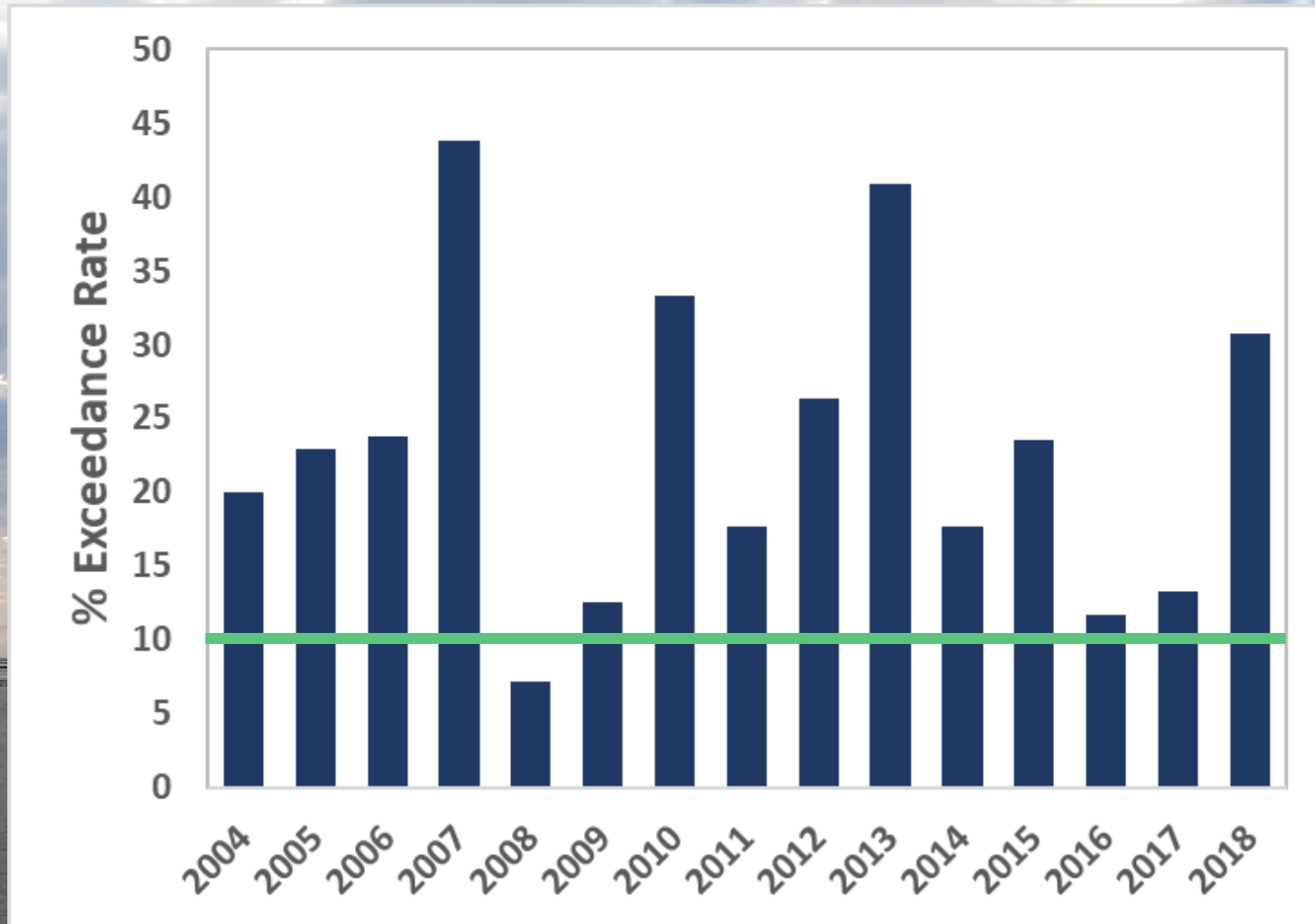
Goose Rocks Beach



Goose Rocks Beach



GR-5 (Batson River)



Summer 2006 Goose Rocks Beach Water Quality Monitoring Project

FINAL REPORT - November 2006



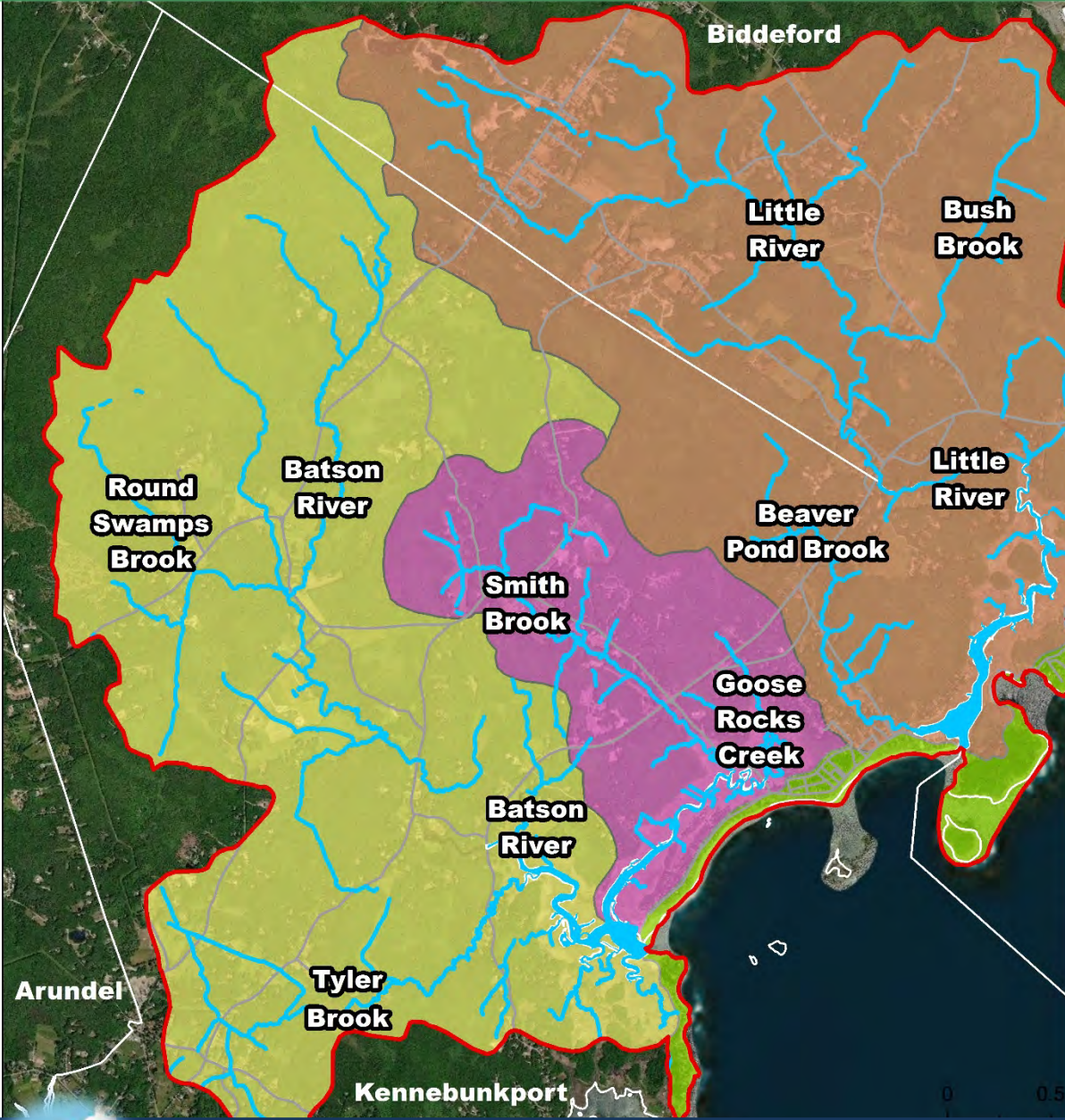
**FB Environmental
Hillier & Associates
Jackson Estuarine Laboratory**



The Response (2006)

- WQ monitoring & GIS
- Hot spot & source identification
- Suspected human sources
- Recommendations
 - Secure funding, source specific methods

Goose Rocks Beach Watershed



Goose Rock Beach Watershed

Streams

Roads

Coastal Watershed

Smith Brook Watershed

Little River Watershed

Batson River Watershed

N

MAINE

Healthy Beaches

Watershed Monitoring



Toolbox Approach

Parameter	Method	Source Target	Cost/Expertise
Enterococci (ENT)	Grab sample, Enterolert	Warm blooded animals	Low/Low
Optical brighteners (OB)	Grab sample, Fluorometry	Human	Low/Low
Pharmaceuticals and personal care products (PPCP)	Grab sample, metabolite analysis	Human	High/High
Canine detection	Grab sample in tandem with canines	Human	Low/Med
Microbial source tracking (MST)	Grab sample, DNA extraction	Variety of human and non-human sources	High/High



The Challenge



Disease-causing pathogens can enter Casco Bay coastal waters from multiple sources, leading to potential public health risks.

Illustration by www.consulting.com. Consulting including symbols adapted from the Integration and Application Network, University of Maryland Center for Environmental Science.

Limitations of Fecal Indicator Bacteria

Inconsistent correlation with pathogens/human health risk

Extreme variability

Next day results

Can persist and regrow

Doesn't differentiate source(s)



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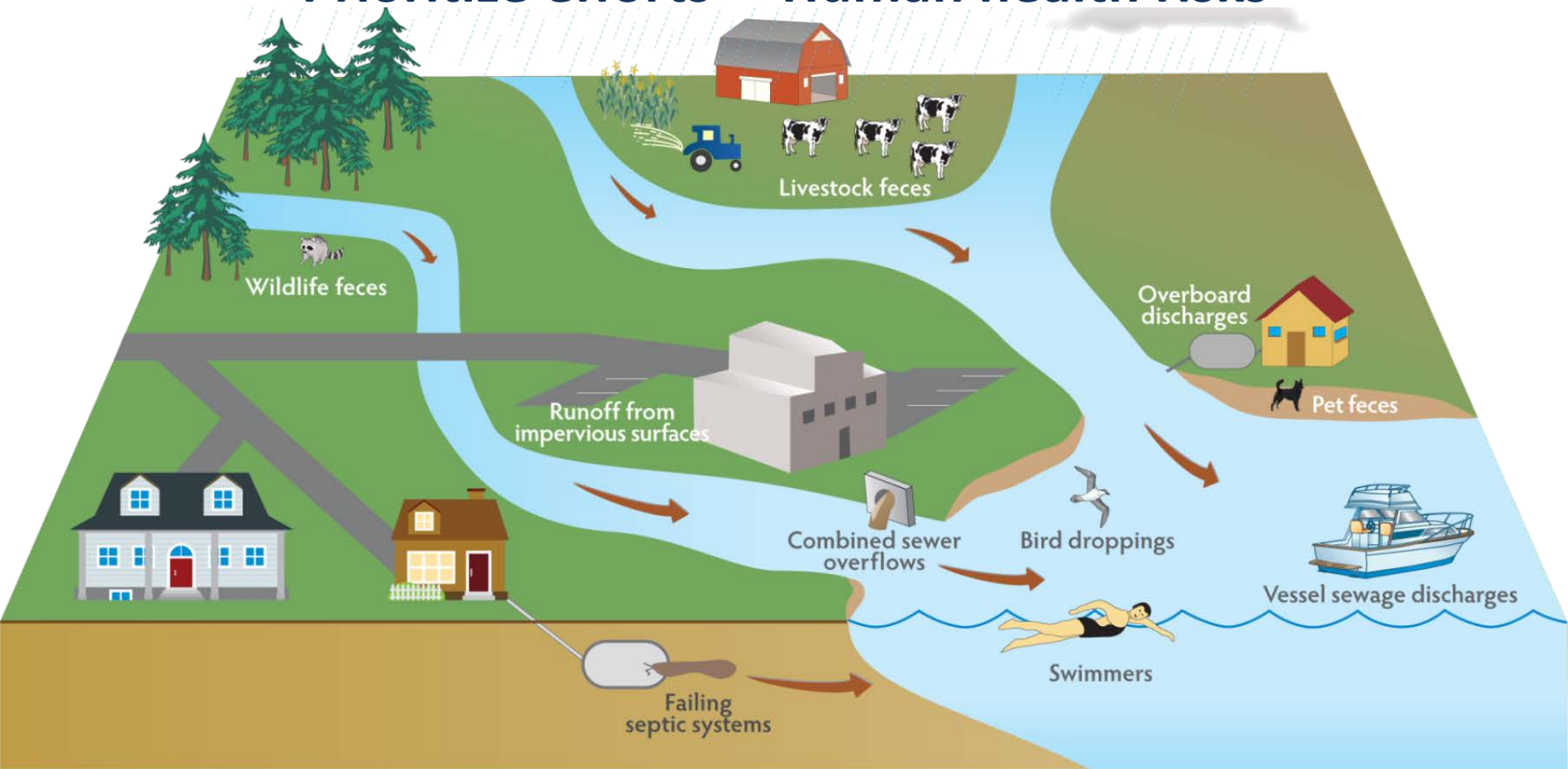
Host source(s)

Signal strength

Seasonal trends

Prioritize efforts

Human health risks



Disease-causing pathogens can enter Casco Bay coastal waters from multiple sources, leading to potential public health risks.

Illustration by Waterview Consulting including symbols adapted from the Integration and Application Network, University of Maryland Center for Environmental Science.

Toolbox Approach

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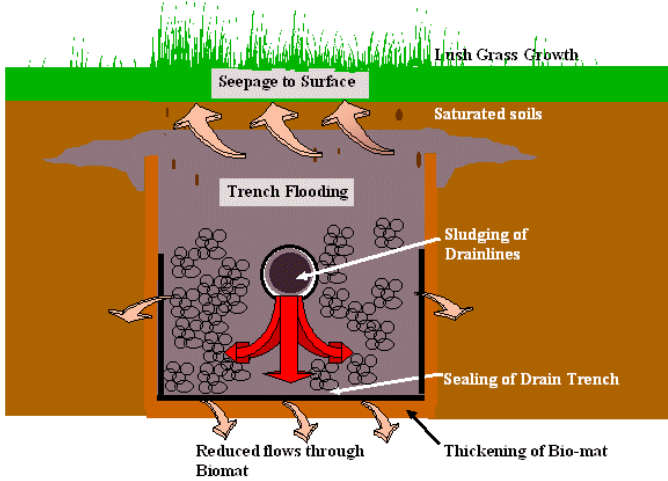
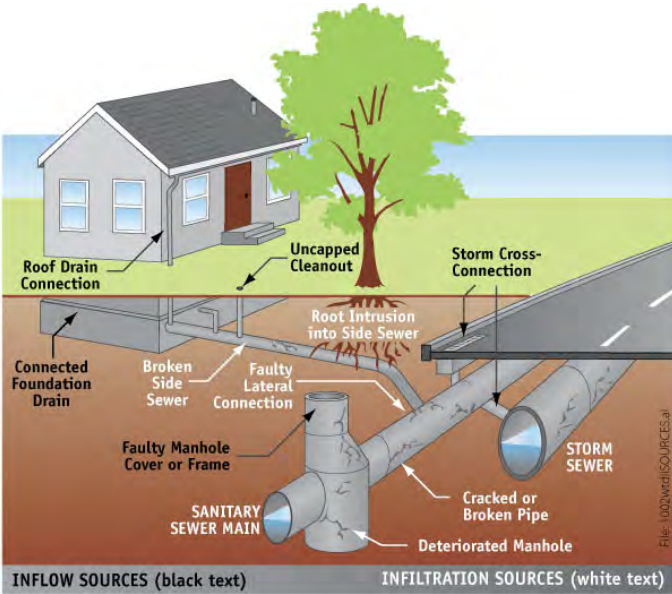
Potential Bacteria Sources



- Mammal
- Bird & gull
- Ruminant (cattle, deer, sheep)
- Canine
- **Human**

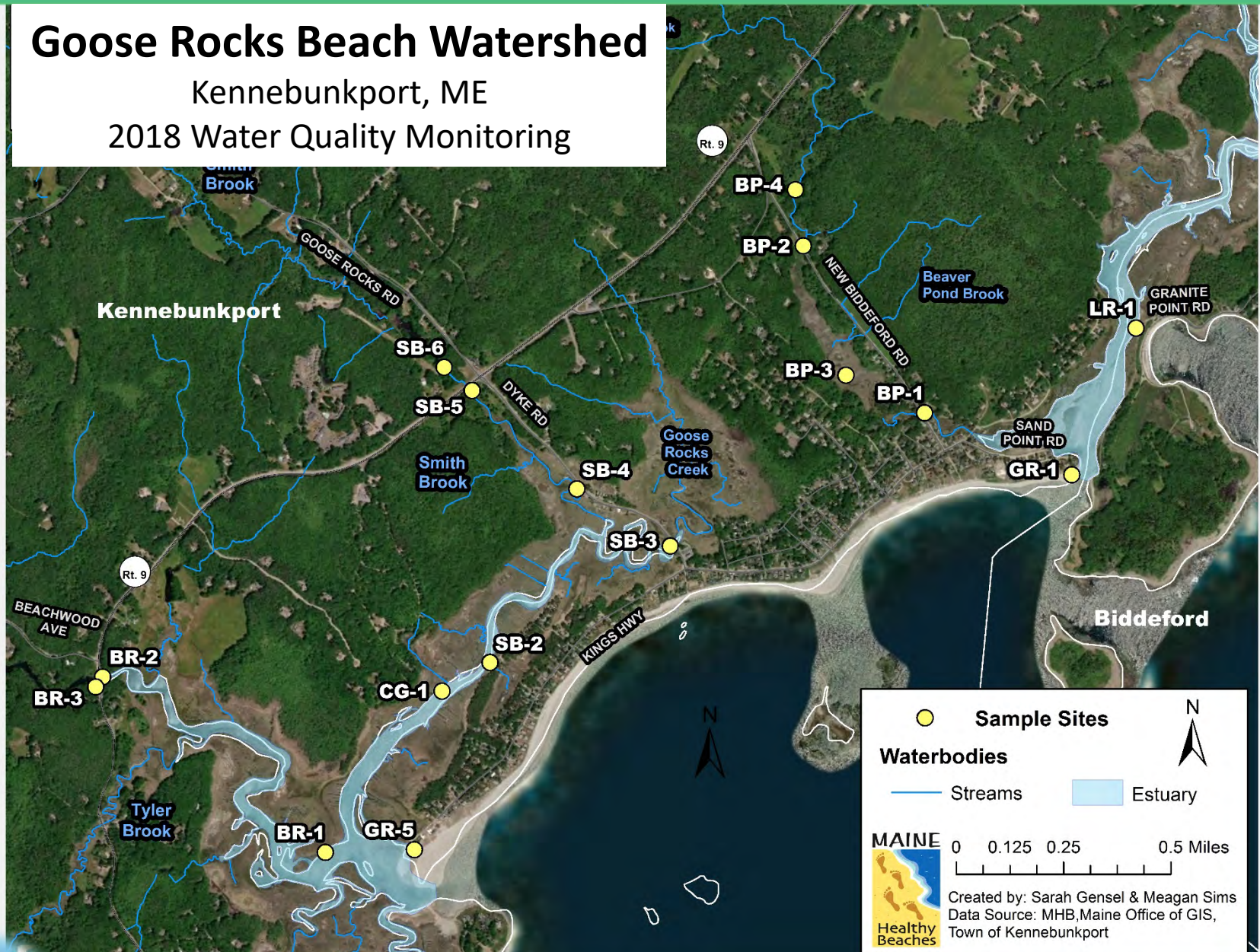


Human Sources



Goose Rocks Beach Watershed

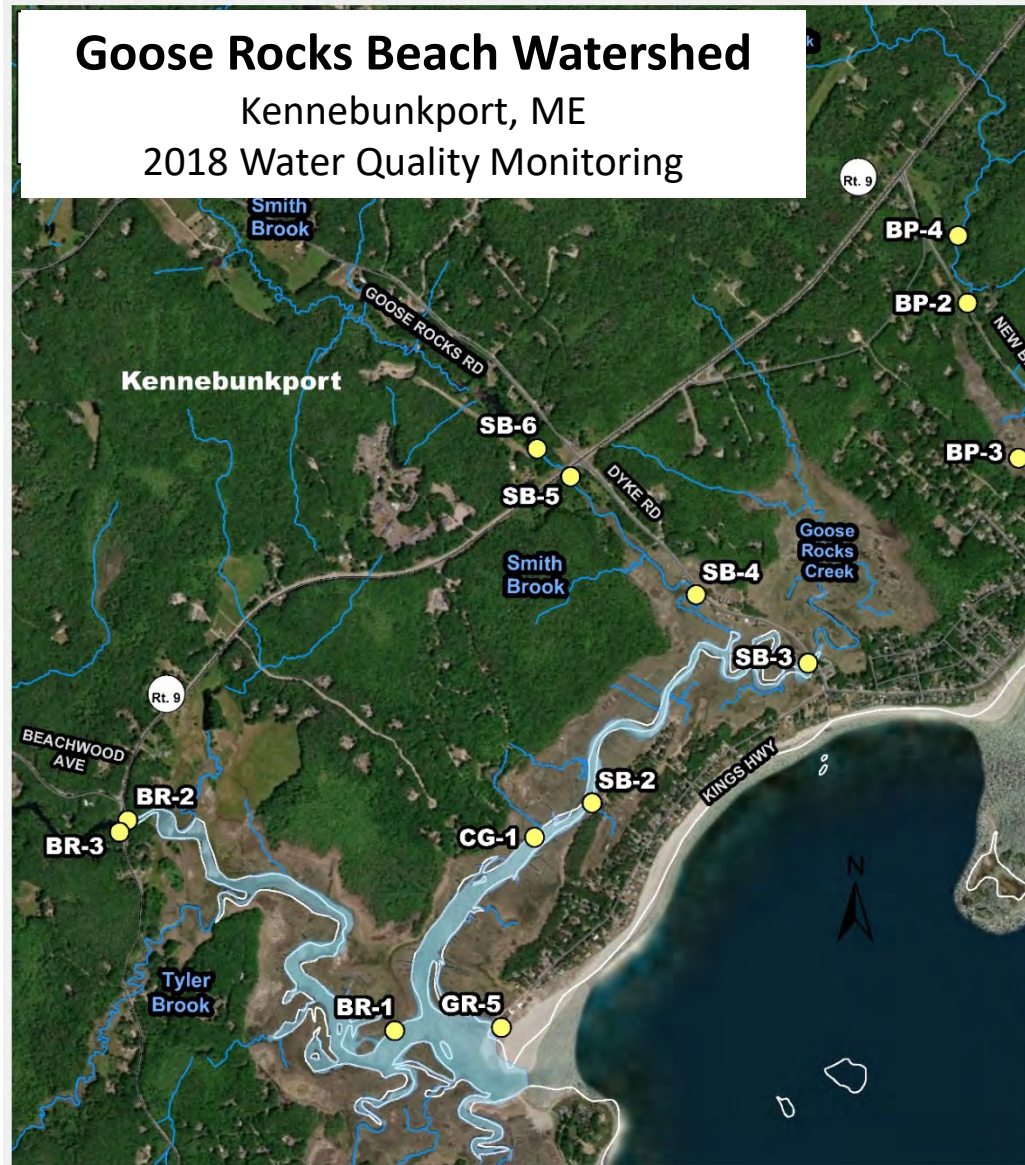
Kennebunkport, ME
2018 Water Quality Monitoring



Goose Rocks Beach Watershed

Kennebunkport, ME

2018 Water Quality Monitoring



2018 WQ Efforts

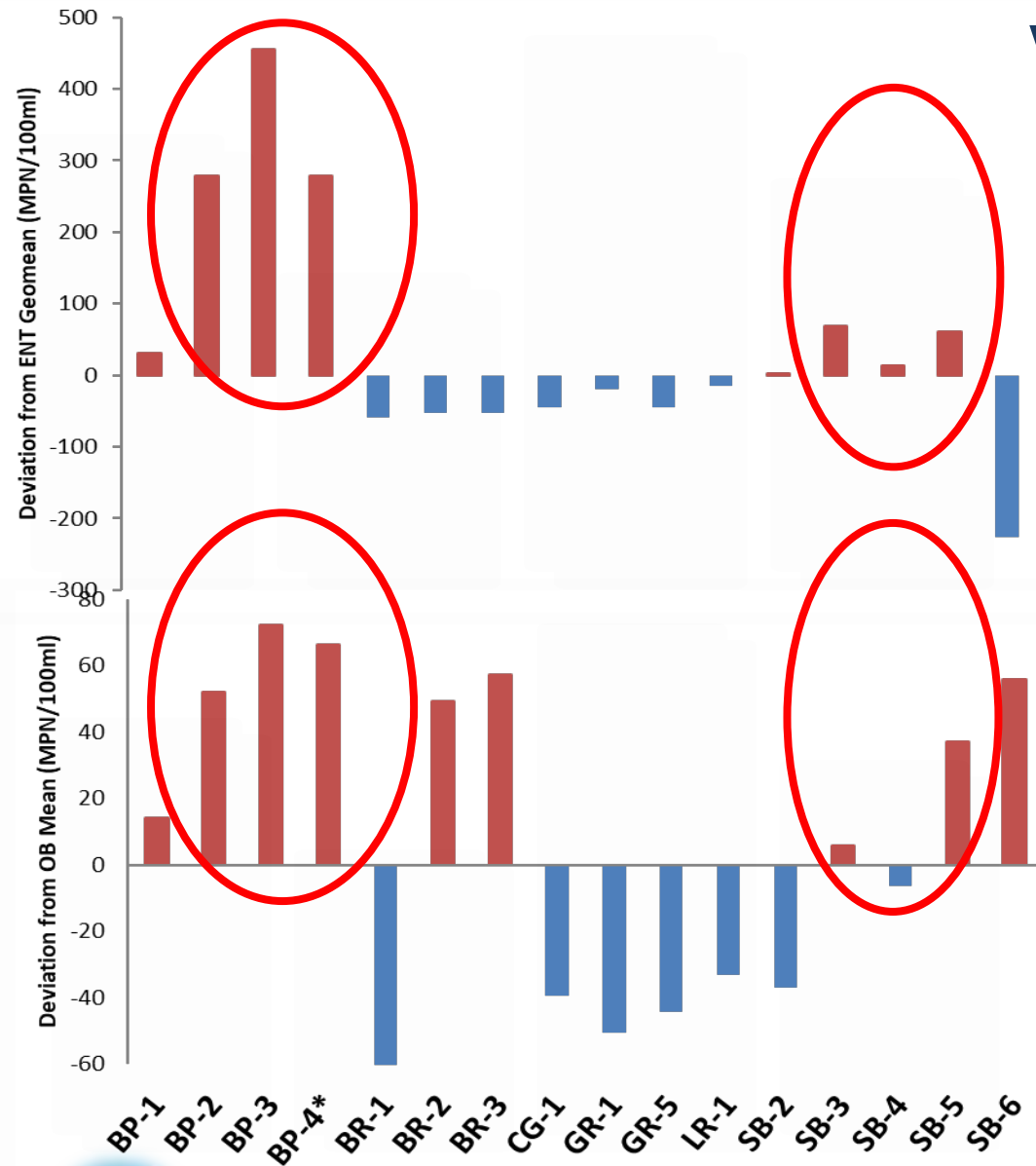
10 Events (June-Oct.)

- ENT/OB
- MST: 3 late season
- Mammal
- Human
- Bird & gull
- Ruminant (deer, sheep)
- Canine

Verify "hot-spots"

Bacteria

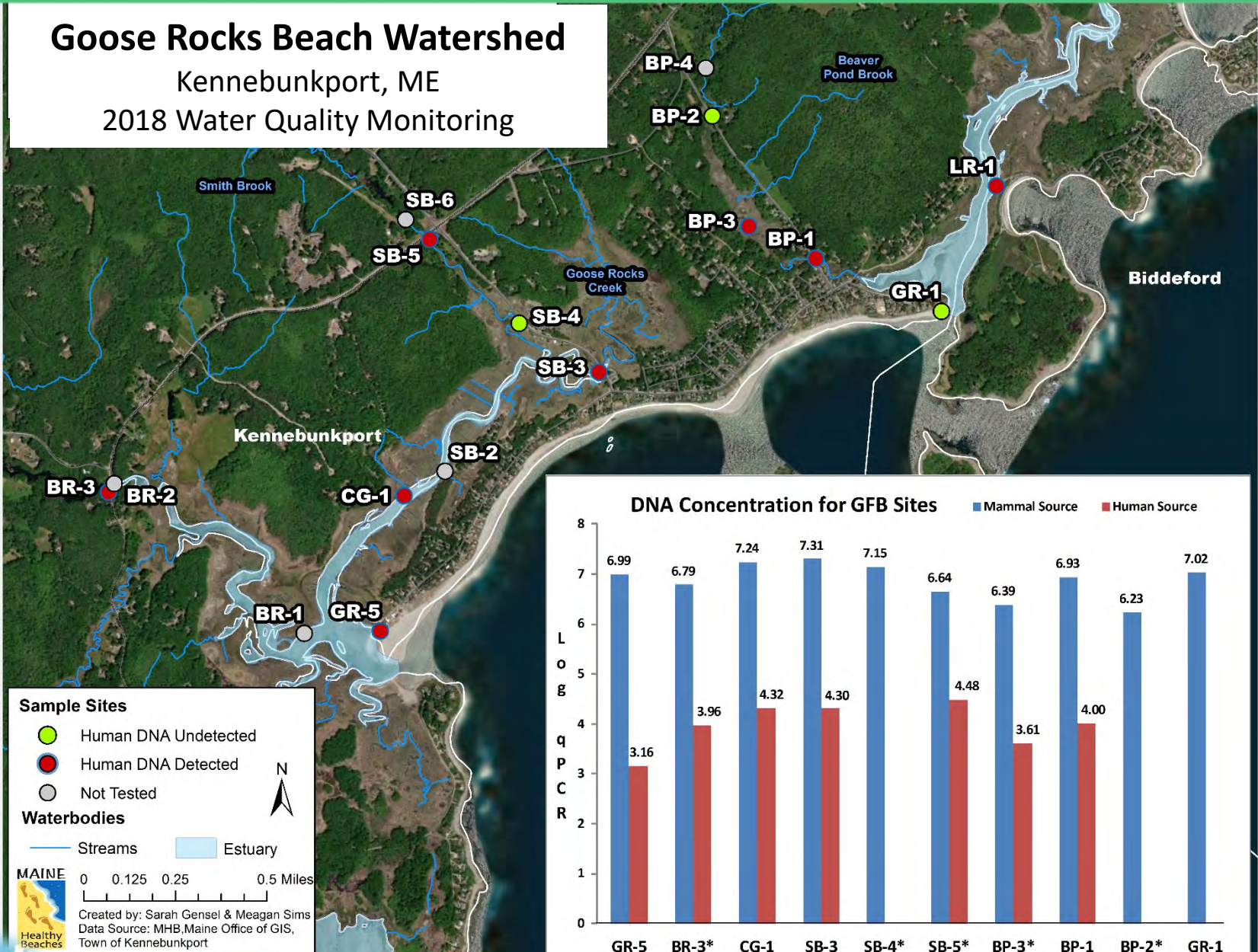
Optical Brighteners



Goose Rocks Beach Watershed

Kennebunkport, ME

2018 Water Quality Monitoring



Transforming Data Into Action

Identify, remediate, and prevent pollution sources

- ✓ Find and fix bacteria sources
- ✓ Enhanced monitoring (track & verify sources)
 - Bacteria, OBs, DNA
- ✓ Education/outreach for specific sources detected
- ✓ Continue infrastructure upgrades/expansions
- ✓ Property surveys (sewer/septic)- smoke/dye test
- ✓ Improved signage at the beach



Challenges

- Funding
- Many potential sources
- Upgrades expensive and time consuming
- Volunteer/staff time
- Maintaining momentum



Expand Partners

- MHB/DEP
- UNH
- GRBAC
- Town departments
 - town manager
 - public health
 - codes
 - planning
 - public works



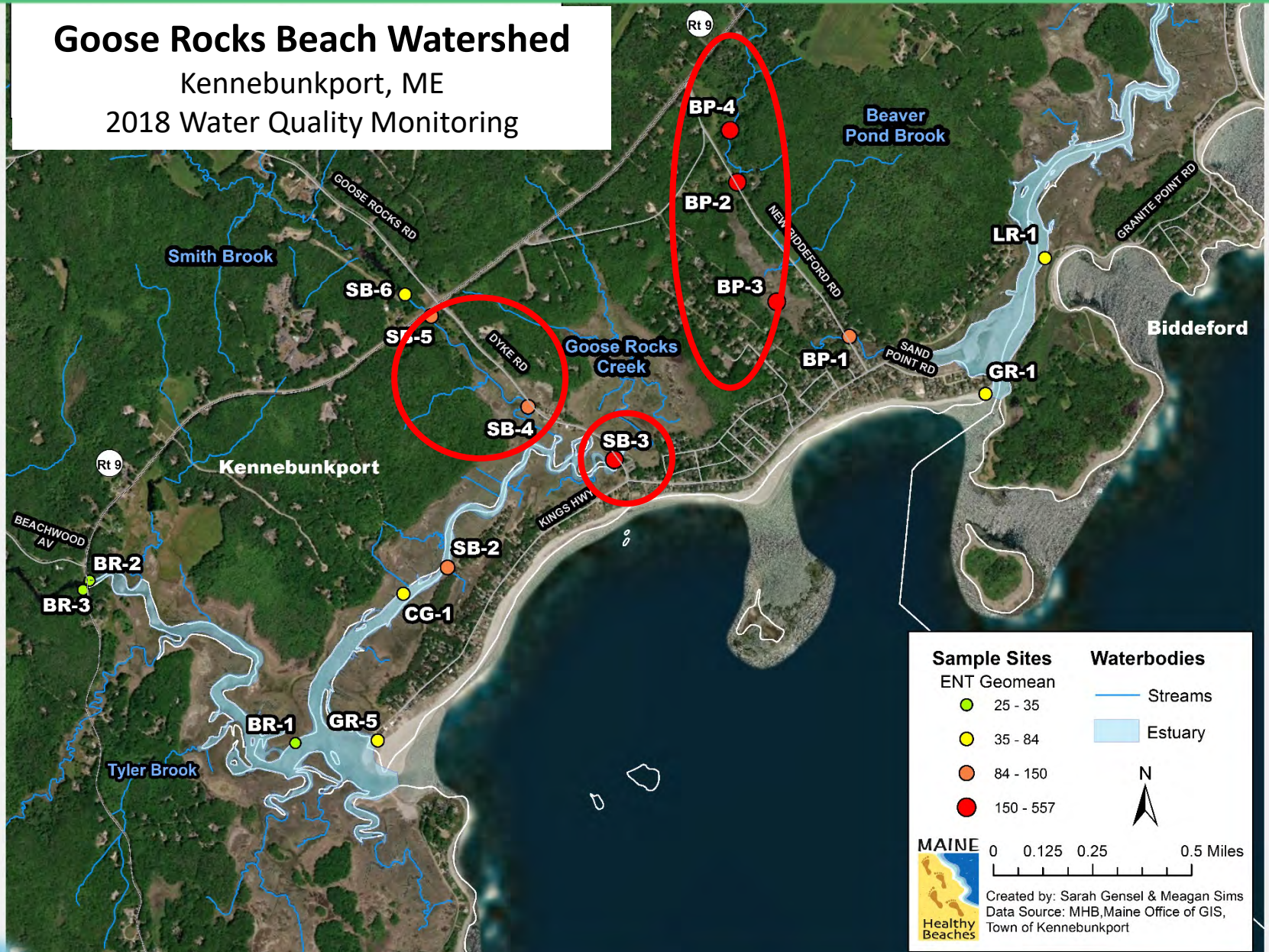
Early Successes

- **Hot-spots identified**
- Septic database
- Town funds and staff time
- Town-supported interns
- Local engagement
 - GRBAC, campground
- Increased local awareness



Goose Rocks Beach Watershed

Kennebunkport, ME
2018 Water Quality Monitoring



Sample Sites	Waterbodies
ENT Geomean	— Streams
● 25 - 35	— Estuary
● 35 - 84	
● 84 - 150	
● 150 - 557	
	N
	0 0.125 0.25 0.5 Miles
MAINE Healthy Beaches	Created by: Sarah Gensel & Meagan Sims Data Source: MHB, Maine Office of GIS, Town of Kennebunkport

Early Successes

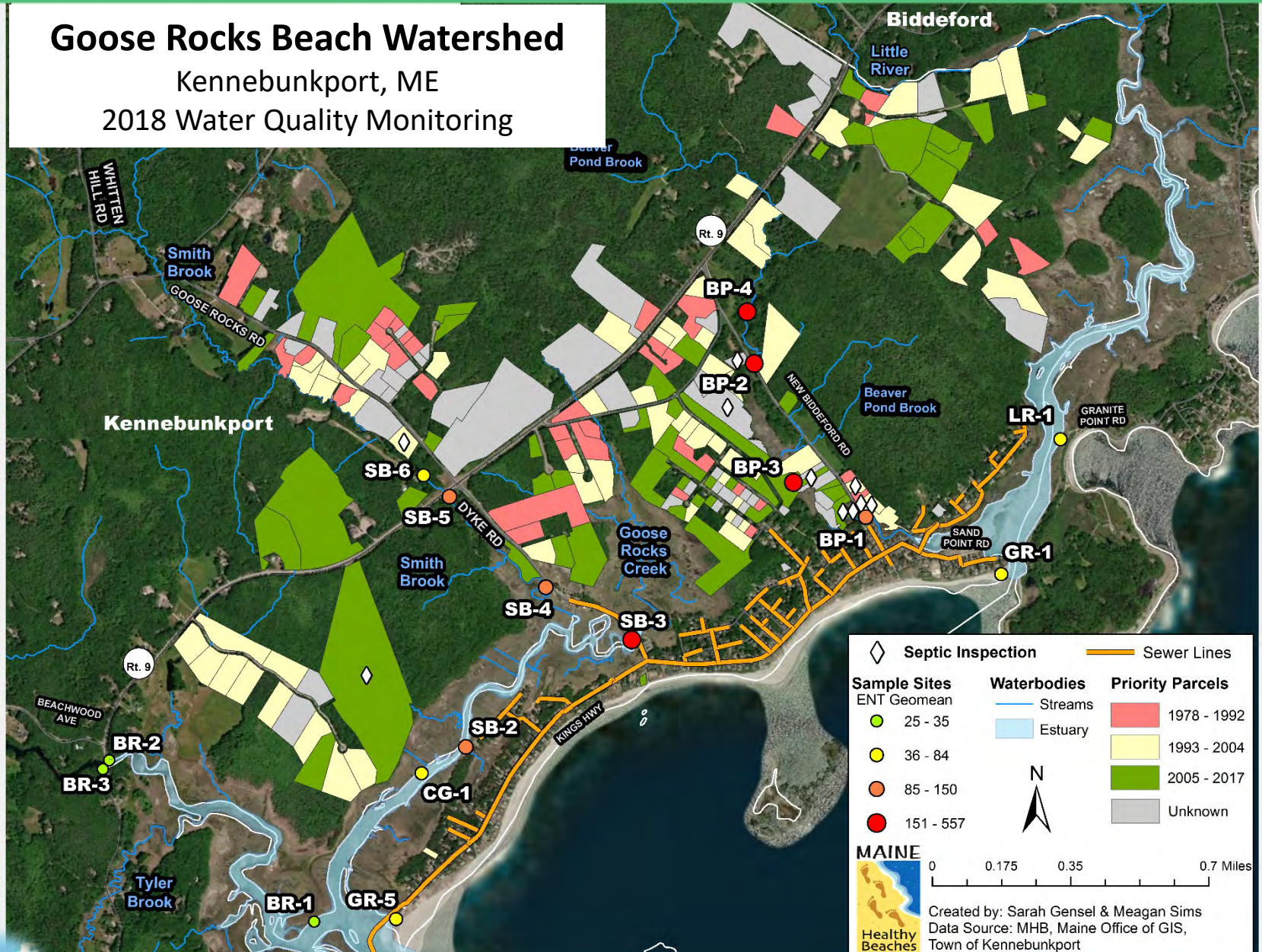
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Goose Rocks Beach Watershed

Kennebunkport, ME

2018 Water Quality Monitoring



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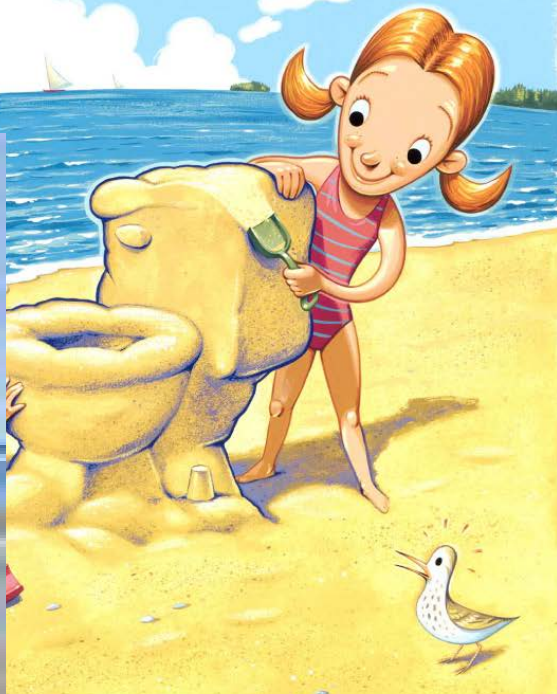


Successes – More to do!

- Increased signage
- More watershed data
- More septic surveys/
sewer investigations
- Explore funding
opportunities
- Better spatial data
 - SW mapping, septics,
sewer, etc.



The beach is not your bathroom.



Targeted Outreach

Protect Water Resources

Please don't feed seagulls

Regular feeding can lead to:

- Water Pollution
- Poor Nutrition
- Over Crowding
- Delayed Migration
- Spread of Disease
- Unnatural Behavior

Septic System Inspection:

Protect your investment by minimizing the risk



Do your part to keep our valuable wildlife and water resources healthy

Keep our beaches

MAINE



Use your **HEAD** | **PUMP IT, DON'T DUMP IT!**

Help us eliminate boat sewage as a pollution source.



What to Do With Doo

Clean up after your pets and do your part to keep our water resources healthy!



Contact:

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207-530-2518

www.maine.gov/dep

