Maine Healthy Beaches

- 60 beach management areas
- Diverse partners
- “Home Rule” state; voluntary program
Value of Healthy Beaches

- Integral to local economies

- Tourist spending ~ 500 mil. York County (Levert 2009)

- Lacking reliable economic, usage and illness data
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 illness can include stomachache, vomiting, diarrhea, and infections of ear, eye, and skin. If you have any of these symptoms within 7 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.

For more information visit: www.mainehealthybeaches.org

Or contact: ________________________________

CLOSED
No Swimming
No Water Contact activities

ATTENTION
Swimming and water contact activities are not advised at this time

Click Here To See Today’s Beach Status and Data

Disclaimer: Information on this site may not reflect current beach conditions. Contact the local beach manager for current beach status.

MAINE COASTAL BEACHES
Beach Management Challenges

- Diverse beaches & managers
- Slow response time
- Implications of beach postings
- Inconsistent protocols
- Dynamic system; lack of predictability
- Distrust of the data

E. Stancioff, 2003
Limitations of Fecal Indicator Bacteria (FIB)

- Inconsistent correlation with pathogens
- Poor correlation with human health risk
- Can persist and regrow in environment
- Doesn’t differentiate source(s)
- One size fits all
- Extreme variability
- Next day results
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.
Watershed Health = Beach Health
Pollution Source Tracking

- Circulation studies
- Toolbox approach
- GIS risk analysis
- Sanitary surveys

Keri Kaczor
Pollution Source Tracking Toolbox
# Pollution Source Tracking Toolbox

<table>
<thead>
<tr>
<th></th>
<th>High Bacteria</th>
<th>Low Bacteria</th>
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</thead>
<tbody>
<tr>
<td><strong>High Optical Brightener</strong></td>
<td>Black water (e.g. human sources - malfunctioning septic system, sanitary sewer cross connection)</td>
<td>Grey or Gray water (e.g. laundry, wash water)</td>
</tr>
<tr>
<td><strong>Low Optical Brightener</strong></td>
<td>Human or non-human sources</td>
<td>Potentially low or no fecal contamination</td>
</tr>
</tbody>
</table>
Pollution Source Tracking Toolbox
GIS: Risk Analysis

Enterococci + Optical Brightener Risk Ranking
- Green: Low
- Yellow: Medium
- Red: High
GIS: Risk Analysis

- Transforms data to usable information
- Priority survey areas
Pollution Source Tracking Toolbox

Pharmaceutical and personal care products

Figure adapted from A. Boxall, EMBO reports Vol. 5, No. 12, 2004
Pollution Source Tracking Toolbox

Microbial Source Tracking

500 mL water sample

Filter – discard water

DNA Isolation

Detect human Polyomavirus DNA

Detect human Bacteriodales bacterial DNA

Detect ALL Bacteriodales bacterial DNA

K. Borges 2012
Pollution Source Tracking Toolbox

Microbial Source Tracking

![Graph showing Enterococcus and HF183 copies over different locations and dates.](image)
### Pharmaceutical & Personal Care Products

<table>
<thead>
<tr>
<th>PPCP</th>
<th>Description</th>
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<tbody>
<tr>
<td>Atenolol</td>
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<tr>
<td>Acetaminophen</td>
<td>Pain killer</td>
</tr>
<tr>
<td>Cotinine</td>
<td>Metabolite of nicotine</td>
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<tr>
<td>1,7-Dimethylxanthine</td>
<td>Caffeine breakdown (after goes through body)</td>
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<tr>
<td>Caffeine</td>
<td>Stimulant</td>
</tr>
<tr>
<td>Carbamazepine</td>
<td>Control seizures</td>
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<tr>
<td>Metoprolol</td>
<td>Control high blood pressure</td>
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<table>
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<tr>
<th>MONITORING STATION</th>
<th>ENT ≥ 33 MPN/100ml</th>
<th>OB ≥100 µg/l</th>
<th>+ Dev. from ENT Mean</th>
<th>+ Dev. from OB Mean</th>
<th>≥4 PPCPs ng/l</th>
<th>+ Canine Det.</th>
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</table>
Sanitary Survey

Explore ALL bacterial pathways

Target humans sources first!

Tiered approach

Malfunctioning septic systems

Leaky sewers/cross connection
Surveying Properties

- Role of trained professionals
- Best tools = eyes and nose!
Surveying Properties

No Two Malfunctions Are Exactly Alike!
Sources are difficult to find

Requires collaboration

Wastewater disposal is costly & options are limited

Need for monitoring, maintenance, & expansion of wastewater infrastructure
The Path to Clean Water is Turbulent

- Sources are removed, new ones emerge
- Over-development & impervious surfaces
- Warmer, wetter climate

M. Warneke
- Intensified rainfall and source tracking studies
- Precautionary rainfall advisories
- Develop beach specific management plans
- End of pipe treatment?
- Prevention
Promoting Best Practices

Think Healthy. Act Healthy.

Swim Healthy.

Practice Healthy Beach Habits!

Maine is famous for its beautiful beaches and healthy swimming waters. There are things you can do to help keep them that way, and help prevent water-related illnesses.

What YOU can do while at the beach:
- Avoid swallowing beach water and try not to let any get in your mouth.
- Change diapers away from the water's edge—in a bathroom if possible—and dispose of in a sanitary manner. Germs can spread if dirty diapers are not disposed properly.
- Wash your hands with soap and water after diapering, or sanitary wipes after using the bathroom or changing children.
- Take your kids on bathroom breaks often—sometimes “I have to go” means it’s already too late.
- Feed nauseous or have diarrhea? Don’t swim. Tell the lifeguard or beach manager of any accidents.
- Be aware that contamination of the water is typically the worst following significant rainfall. To avoid risk, consider staying out of the water 48 hours following a significant rain event.

What you can do as a BOATER:
- Never discharge untreated sewage directly into the water.
- Make certain you know the laws and best boating practices.
- For more details on best practices for pumpout station locations, see our Healthy Boating Equals Healthy Beaches brochure www.mainehealthybeaches.org

What you can do as a CITIZEN:
- Maintain and routinely pump out your septic system.
- Properly dispose of pet waste and/or livestock remains.
- Maintain appropriate vegetation buffer strips along waterways.

Share the knowledge—many people are not aware that beach health risks exist!

Thank You.

www.MaineHealthyBeaches.org

Use your HEAD

PUMP IT, DON'T DUMP IT!

Help us eliminate boat sewage as a pollution source.

Boat sewage degrades water quality and marine habitats. Elevated fecal bacteria levels in coastal waters can pose a human health risk, leading to closures of valued beaches and shellfish growing areas.

The Maine Department of Environmental Protection, in cooperation with the Maine Home Builders Association and Discharge Areas, is collaborating to eliminate boat sewage disposal as a pollution source.

What can you do?
- Be a responsible boat owner.
- Dispose of sewage properly.
- Do not feed nauseous or have diarrhea?
- Maintain your home's septic system.
- Dispose of pet waste properly.
- Maintain or plant vegetative buffer strips along waterways.

Successful water quality protection

To find out more about this project, please contact Keri Spindel, Maine DEP, 207-624-6125.

For more information about No Discharge Areas, contact Pam Parker, Maine DEP, 207-287-7902.

Please keep our beaches healthy.
Questions?