Bacteria Highs and Lows: Review of Maine's Healthy Coastal Beaches Program

Speakers:

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Esperanza Stancioff

Maine Healthy Beaches Program is entirely voluntary. It is not mandated and has no enforcing legislation. The program tests for enterococci using the Enterolert method that gets results in 28-32 hours. The protocol calls for resampling after exceedances. The cut off point is 104 colonies per 100ml of sample. Advisories and closures are posted by the state park or town and the program staff help to advise on these decisions.

Maine Healthy Beaches Program beach notification days
- Advisories have increased over the past 3 years;
- There have been more rain events;
- There has been better detailing at the local level.

The Program is working on areas needing surveys and special studies
- 2006
  Biddeford and Willard Beach: sanitary shoreline surveys;
  Kennebunkport: FB Environmental Study.
- 2007
  Ogunquit: Ogunquit River Special Study
  Kennebunk: Kennebunk River, Goochs Beach.

Collaboration among communities
- ex. Biddeford and Kennebunkport have been working together in Goose Rocks Beach watershed.

Steve Jones: Microbial Source Tracking

Water Quality Issues at Maine Beaches:
- Public Health Threat
- Studies show widespread pollution problems with storm events

Water Borne Diseases and Pathogens
- Fecal Borne
- 100s of bacteria can cause water-born infection, but not all are fecal

Goals of Microbial Source Tracking
- Identify fecal pollution sources

- Indicator of pathogens as human/non-human or actual source species
- Track pollution in time

What is the culprit of fecal contamination? Common target organisms: enterococci (marine waters) & e. coli (freshwater).

Types of Microbial Source Tracking: with most methods it's necessary to culture bacteria, but with gene tracking this is not necessary.

- Phenotypic – secondary characteristics
- Genotypic – based on genetic makeup
- Library Dependent
- Library independent

Microbial Source Tracking considerations

- Reproducible
- Present & Surviving? Growing?
- Identify Species
- Labor, time, cost?
- Training and ease of test
- Cultivation and/or library
- Existing studies, limitations, field testings

Applied Microbial Source Tracking (NH)

- Chose E. Coli in 1999
- Began 2000
- Automated process 2003
- Ribotyping method: uses bacteria in intestines that are species unique
- Uses a regional source species database
- Recent projects have been at a small tributary scale where upstream contamination was thought to be causing beach pollution.
- Sources species are identified as a percent/total, but the process still yields high percent unknown

Matt Liebman

EPA's Clean Beaches Initiative

- Grants provided since 2001
- Comparison and analysis of Rainfall and Beach Action Days (BADs)

Why are we having so many problems? What can we do better?

3 kinds of problems

- CSOs
- Sewers
- Culverts on coastal streams

Bacteria from Non-Point Sources (NPS)

- Concentrated source
- Environmental growth
- Riparian zones of streams have been removed

NPS risks/causes of illness
- Working on better notification of public about risks
- Would it be more effective to predict possible presence of pathogens?
- Working on rapid testing methods: the EPA is doing a study in Rhode Island during the 2007 beach season

Can we better track sources of pathogens?
- EPA promoting a tool box approach
- Focusing on non-library dependent methods
- Evaluating many approaches with other agencies
    - Enterococci esp gene
    - Optical brightners
    - Coliphage

Success stories:
- Warren Beach, Scarborough, Rhode Island
- Wollaston Beach, Willows Pier, Provencetown, MA