

Beach 101

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Sleeping Bear Dunes Photo by Steve Keighly, Winner of the Instagram Beach Photo Challenge for favorite beach to take a long walk.

Stomp out *E. coli*!



Field Gear for Collecting Samples



Where to sample?



Defined swimming area



Water samples collected, store on ice, < 6 hour holding time

Give lab 2 hours to prepare samples

Lab Methods

Method	Sample Cost	Equipment Cost	Hours	- / + Comments
Culture Based	\$8 to \$20	\$5,000	18-24	Time delay in results but easy to do
QPCR	\$70 to \$100	\$20,000+	3-5	Expensive and technical but quick and does source tracking
Digital PCR	Potentially less than QPCR	\$40,000-\$100,000	3-5	

Other methods in development

Monitoring Costs for Culture Based Methods

\$ 75 to \$100 sanitary survey

\$14 to \$20 per sample for analysis

\$13 per hour for students

**Training, Equipment,
Computers, Mileage, Publishing**

IMMEDIATE REPORTING REQUIRED

At least \$100 cost per sample event

Notification Signs



required in Michigan by Health Code, and BEACH Act grant requirements

Monitoring Approach Annapolis Protocol 1999



World Health Organization
Sustainable Development and Healthy Environments

WHO/SDE/WSH/99.1
Original: English
Dist.: Limited

HEALTH-BASED MONITORING OF RECREATIONAL WATERS: THE FEASIBILITY OF A NEW APPROACH (THE 'ANNAPOLIS PROTOCOL')

**OUTCOME OF AN EXPERT CONSULTATION,
ANNAPOLIS, USA CO-SPONSORED BY USEPA**

The image shows the cover of a book. It features a semi-circular graphic with a cityscape, mountains, and water. Below the graphic, the text reads: 'Protection of the Human Environment Water, Sanitation and Health Series'. At the bottom of the graphic, it says 'Geneva 1999'.

**Protection of the Human Environment
Water, Sanitation and Health Series**

Geneva
1999

http://www.who.int/water_sanitation_health/bathing/Annapolis.pdf

Monitoring Approach

Identify Beach



Conduct sanitary survey (include weather data)
and collect monitoring data

Evaluate All Data

Evaluate All Data



home blog

Virtual Beach

"Virtual Beach" is [free decision-support software](#) for Windows that enables beach managers, public health professionals, and applied researchers to develop and operate water-quality

- Whether to issue (or lift)
- What type of lab test (if a
- Where and how to priori



Virtual Beach - Pathogen-Indicator Model Building and Prediction

Virtual Beach 3
Software for Developing Empirical Models of Pathogen Indicators in Recreational Waters

TURNING DATA INTO DECISIONS

USEPA
Office of Research and Development
Ecosystems Research Division
Athens, GA

USGS
Wisconsin Water Science Center
Middleton, WI

Wisconsin DNR
Madison, WI

Release 3.0.4

Learn the Issues

Science & Technology

Laws & Regulations

About EPA

On This Page...

[About Virtual Beach](#)

[Virtual Beach Users](#)

[Online Data](#)

[Training](#)

Exposure Assessment Models

Exposure Assessment Models

Modeling Products

Groundwater Models

Surface Water Models

Food Chain Models

You are here: [EPA Home](#) » [Exposure Assessment Models](#) » [Virtual Beach \(VB\)](#)

Virtual Beach (VB)

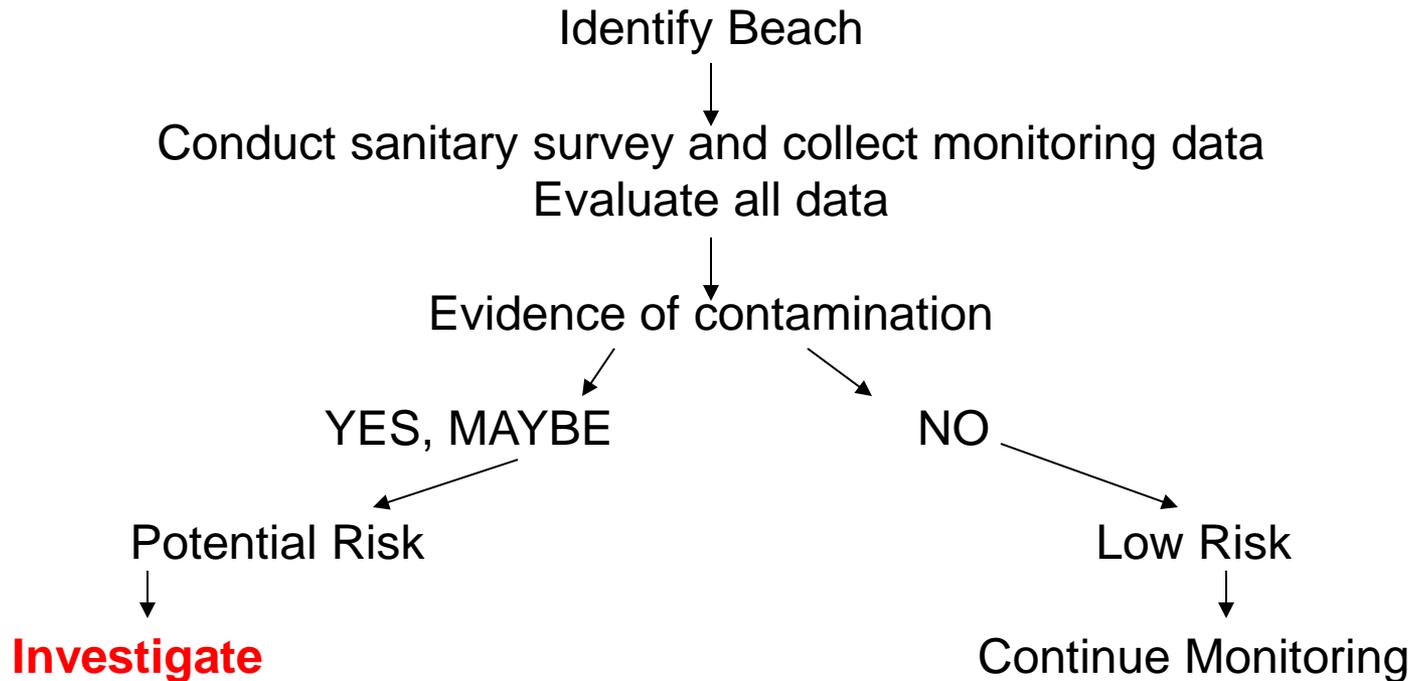
On this page:

- [Introduction](#)
- [Audience](#)

Virtual Beach Releases

Version	Release Date
3.0.4	December 2014

Monitoring Approach



Investigate

More Sanitary Surveys

<http://www2.epa.gov/beach-tech/beach-sanitary-surveys>



The screenshot shows the top navigation bar of the EPA website. On the left is the EPA logo with the text "United States Environmental Protection Agency". To the right are language links: "Español", "中文: 繁體版", "中文: 简体版", "Tiếng Việt", and "한국어". Below these is a search bar labeled "Search EPA.gov" with a magnifying glass icon. A dark blue navigation menu contains four items: "Learn the Issues", "Science & Technology", "Laws & Regulations", and "About EPA".

Related Topics: [Technical Resources about Beaches](#)

[Contact Us](#) [Share](#)

Beach Sanitary Surveys

On this page:

- [Background](#)
- [Marine Beach Sanitary Survey](#)
- [Marine Sanitary Survey Webinar](#)
- [Great Lakes Sanitary Survey](#)
- [Other Sanitary Survey Information](#)

Other Beaches Links

- [Find your Beach](#)
- [National List of Beaches](#)
- [Grants](#)
- [Sanitary Survey Tool](#)
- [Annual Swimming Season Statistics](#)

Background

A sanitary survey is a method of investigating the sources of fecal contamination to a water body. Sanitary

Investigate

Environmental Canine Services



Karen and Logan



Scott and Sable



Aryn and Crush



Stephanie and Kona



Dan and Abbey



Laura and Kenna

Investigate

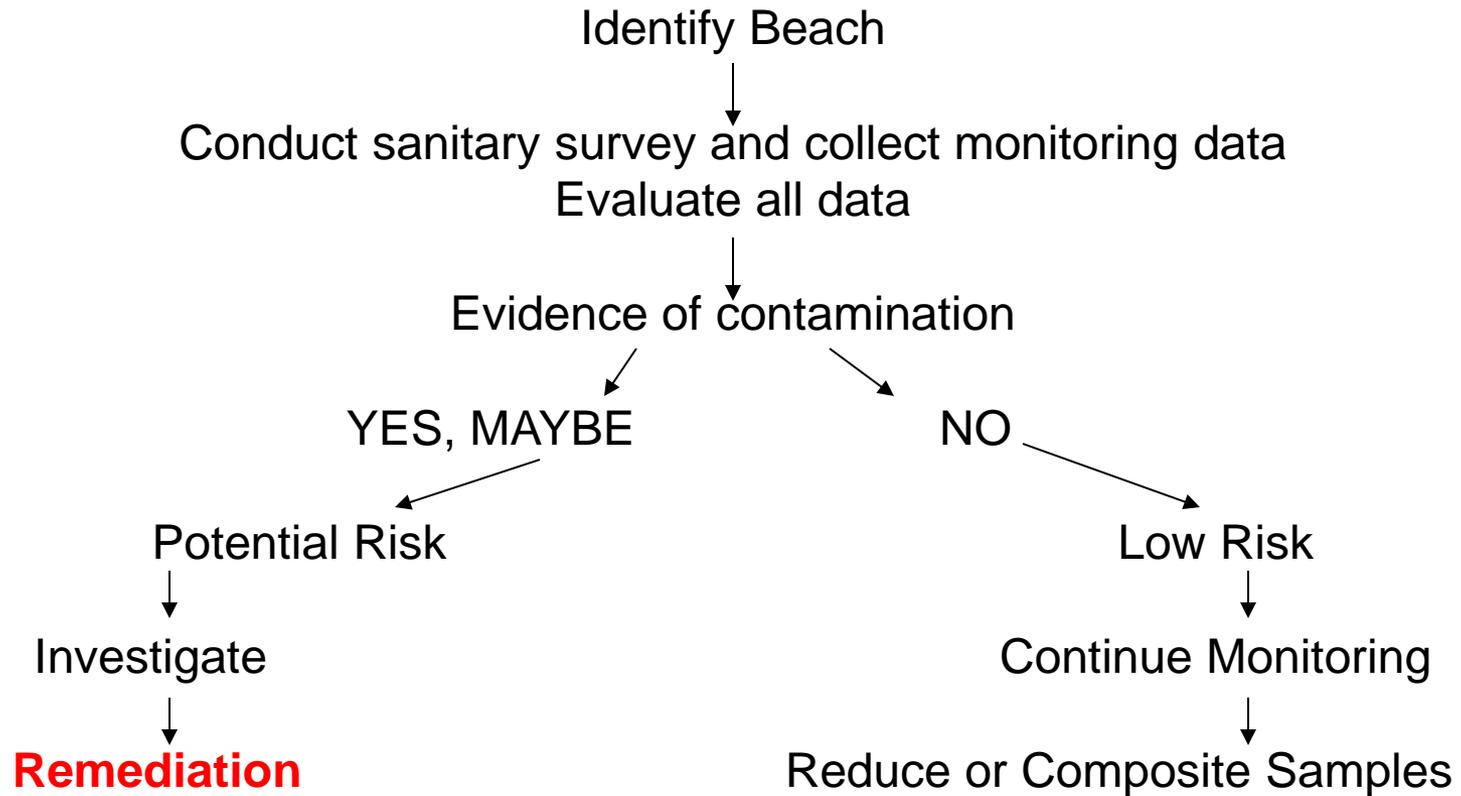
DNA Source Tracking Quantitative Polymerase Chain Reaction



Identify and Correct Sources



Monitoring Approach



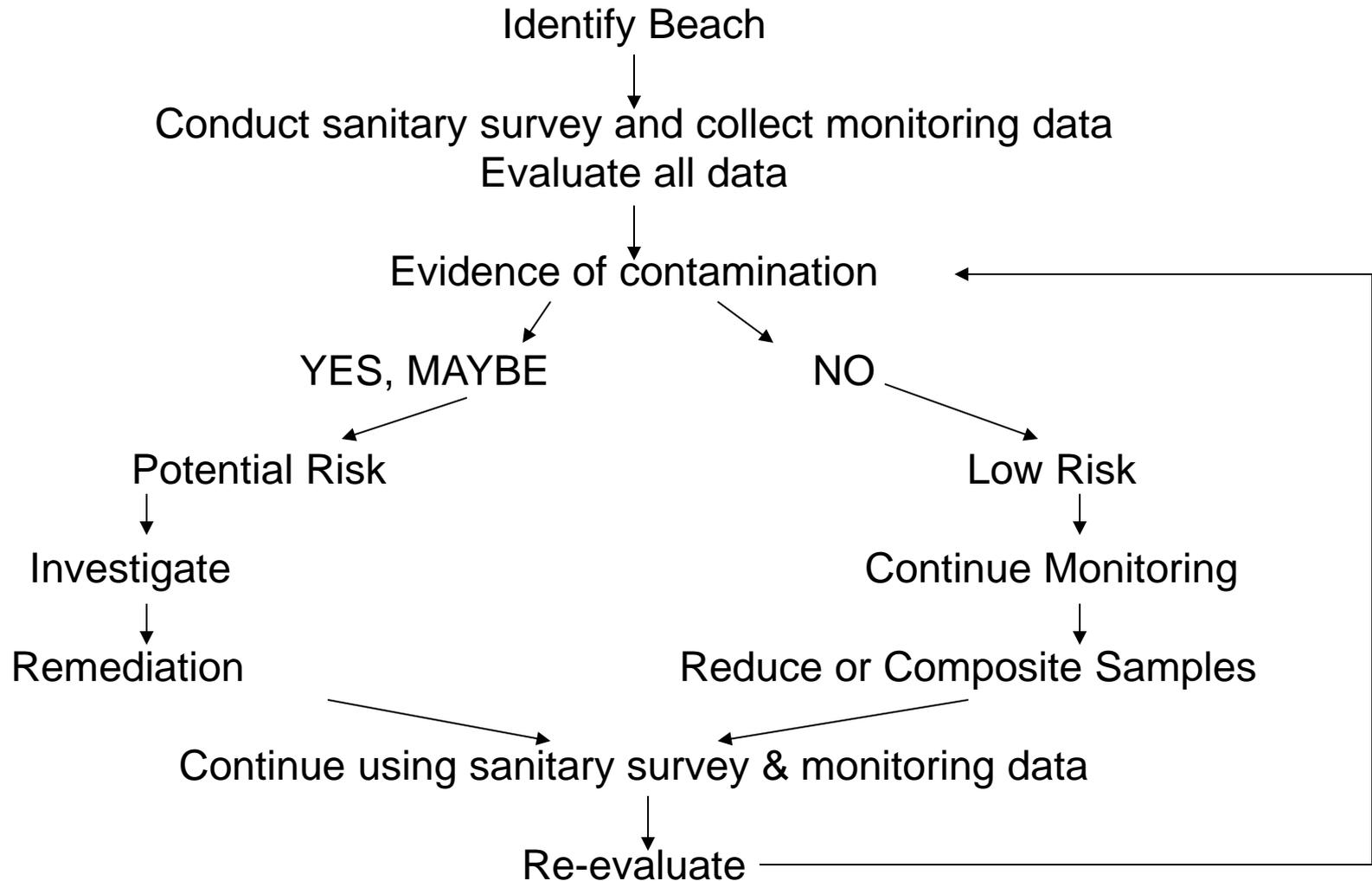
Remediation

add or change landscaping

redesign slope of beach, groom beach



Monitoring Approach



beachnet@great-lakes.net



Your link to 1,000+ members
working with beaches and water quality!



GLBA

Great Lakes *Beach Association*

Working together to improve recreational beach water quality

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The logo for the Great Lakes Beach Association (GLBA) features the letters "GLBA" in a bold, white, sans-serif font. The letters are set against a background of two overlapping circles: a larger teal circle on the left and a smaller white circle on the right. The background of the entire header is a photograph of a sandy beach with waves breaking in the distance and a few people walking on the shore.

GLBA

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Marquette in October 5-7, 2016



Beach listservs

beachnet@great-lakes.net

MIQPCR@LIST.MSU.EDU

beachinfo@lists.epa.gov