

BEACH 101

Great Lakes Beach Association Conference

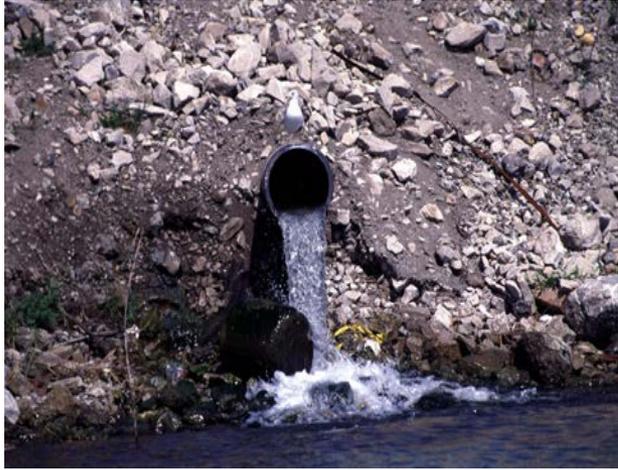
Marquette, Michigan

October 5, 2016



Warren Dunes Park MI

Sources of Pollution Affecting Water Quality



E. coli and Enterococci are fecal indicator bacteria used to measure the presence of fecal contamination in water.



Waterborne pathogens

Pathogen	Disease	Effects	
Bacteria	<i>Escherichia coli</i> (enteropathogenic)	Gastroenteritis	Vomiting, diarrhea, death in susceptible populations
	<i>Helicobacter pylori</i>	Gastritis	Diarrhea. Peptic ulcers are a long-term sequela.
	<i>Legionella pneumophila</i>	Legionellosis	Acute respiratory illness
	<i>Leptospira</i>	Leptospirosis	Jaundice, fever (Weil's disease)
	<i>Pseudomonas</i>	Infections in immunocompromised individuals	Urinary tract infections, respiratory system infections, dermatitis, soft tissue infections, bacteremia, and a variety of systemic infections
	<i>Salmonella typhi</i>	Typhoid fever	High fever, diarrhea, ulceration of the small intestine
	<i>Salmonella</i>	Salmonellosis	Diarrhea, dehydration
	<i>Shigella</i>	Shigellosis	Bacillary dysentery
	<i>Vibrio cholerae</i>	Cholera	Extremely heavy diarrhea, dehydration
	<i>Yersinia enterocolitica</i>	Yersinosis	Diarrhea
Protozoans	<i>Balantidium coli</i>	Balantidiasis	Diarrhea, dysentery
	<i>Cryptosporidium</i>	Cryptosporidiosis	Diarrhea
	<i>Entamoeba histolytica</i>	Ameobiasis (amoebic dysentery)	Prolonged diarrhea with bleeding, abscesses of the liver and small intestine
	<i>Giardia lamblia</i>	Giardiasis	Mild to severe diarrhea, nausea, indigestion

Source: EPA's *National Beach Guidance and Performance Criteria for Grants*

EPA's Beaches Environmental Assessment and Coastal Health (BEACH) Program



BEACH Program goal:

Significantly reduce risk of waterborne illness to users of the nation's recreational waters through improvements in recreational water programs, communication and scientific advances.



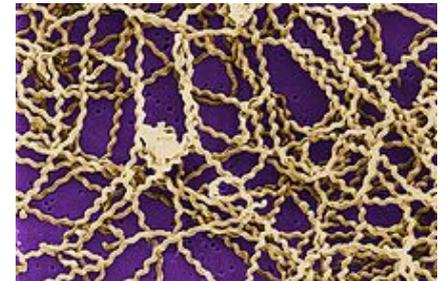
EPA's Beaches Environmental Assessment and Coastal Health (BEACH) Program

Key objectives of EPA's Beach Program:

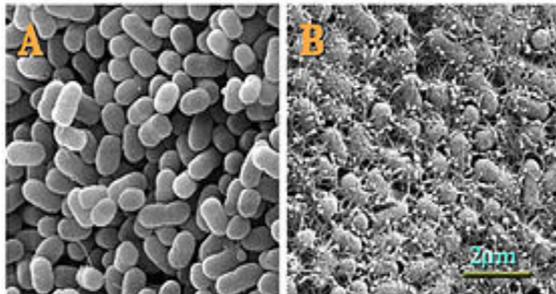
1. Strengthen water quality standards for beach programs.
2. Improve beach programs
3. Provide better information about beach water quality.
4. Promote research to protect the health of beach users.

Swimming-associated outbreaks in the midwest

Outbreak of leptospirosis affected 12% of triathlon participants and community residents in Springfield, Illinois, 1998.



Outbreak of *E. coli* O157:H7 at state park swimming beach in Rockford, Illinois, 1995.



Take Frequent Bathroom Breaks:
Keep Pee and Poop Out of the Pool!



The water with diarrhea in pools allows the bacteria and viruses to spread and to infect. These germs can spread the path to the water and other swimmers. Diarrhea does not kill germs instantly!

www.cdc.gov/od/oc/media/2012/s012212a01.htm

Can You Read This?

Can you read the word **GOT** in the picture?

GOT = 1

DIARRHEA? = 2

DON'T = 3

SWIM! = 4

When you're swimming, stay out of the water. Don't allow your germs to get into the pool.

www.cdc.gov/od/oc/media/2012/s012212a01.htm

WANTED: DIRTY DIAPERS



→ Based on evidence of spreading poop and pee in the pool
→ Duty of spreading germs and making us, staying open and empty

REWARD: A CLEAN AND HEALTHY POOL.

Check diapers every 15-30 minutes and change them in the bathroom. **NOT** at the pool!

www.cdc.gov/od/oc/media/2012/s012212a01.htm

Wash With Soap
(especially the rear end!)
Before You Swim



Washing with soap before swimming helps reduce the number of germs that can get into the pool.

www.cdc.gov/od/oc/media/2012/s012212a01.htm

Diarrhea and Swimming
DON'T MIX

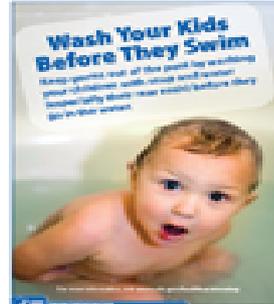
If you have diarrhea, stay out of the water. Don't allow your germs to get into the pool.



www.cdc.gov/od/oc/media/2012/s012212a01.htm

Wash Your Kids Before They Swim

Keep germs out of the pool by washing your children with soap and water immediately after they swim before they get in the water.



www.cdc.gov/od/oc/media/2012/s012212a01.htm

Beaches Environmental Assessment and Coastal Health (BEACH) Act

October 10, 2000



To reduce the risk of disease to users of coastal recreation waters and to improve the quality of coastal recreation waters.

Key BEACH Act Provisions:

1. Authorizes grants to implement beach monitoring and notification programs.
2. Requires that states have the most protective water quality criteria for bacteria at coastal waters.
3. Requires EPA to study issues associated with pathogens and human health and publish new criteria.

Key BEACH Act Provisions:

1. **Authorizes grants to implement beach monitoring and notification programs.**
 - \$9M issued per year to 30 coastal states, 5 territories and 3 tribes.
 - \$120M in BEACH Act grants have been issued.
 - Approximately 4,000 coastal beaches are monitored.





Beach Advisory & Closing On-Line Notification (BEACON)

- BEACH Act grantees must submit beach data to EPA annually.
- EPA must maintain state beach data and make it publicly available.

BEACON 2.0 - Beach Advisory and Closing On-line Notification

You are here: EPA Home » Beaches » BEACON 2.0 » Find a Beach

Find a Beach

Go To: Address or Location Type state, zip, or address

Latitude: 32.0499 Longitude: -134.0593

Legend

- Jurisdictions with beach data
 - States and Counties
 - Tribes
- Beaches (by last reported status)
 - No advisory or closure
 - Advisory

Alaska, Hawaii, US Territories, and Tribes

Alaska Hawaii American Samoa

Indianas >>

Bad River Band N. Mariana Islands

Grand Portage Puerto Rico

Malah US Virgin Islands

http://www.epa.gov/

EPA United States Environmental Protection Agency

LEARN THE ISSUES SCIENCE & TECHNOLOGY LAWS & REGULATIONS ABOUT EPA

BEACON 2.0 - Beach Advisory and Closing On-line Notification

You are here: EPA Home » Beaches » BEACON 2.0 » Reports

Reports

About Beaches Find a Beach Reports RSS Generator

Instructions: Use the wizard below to follow three steps to select beaches, set search filters and view BEACON 2.0 reports. Step 1 allows you to select the county, and/or beach. Step 2 allows you to add filtering by date and alter other miscellaneous filters. Step 3 displays a list of available reports for use with

Step 1 - Location Filter Step 2 - Additional Filtering Step 3 - Report Selection

Notes: You must select at least one location filter. In order to look up beach names grouped by HUC code, use the following link to [My WATERS Mapper](#) codes.

- Select by EPA Region (click to open/close selection list)
- Select by Great Waterbody (click to open/close selection list)
- Select by State/Tribe/Territory, County, and/or Beach (click to open/close selection list)

Key BEACH Act Provisions:

- 2. Requires that states have water quality criteria for bacteria as protective of human health as EPA's recommended water quality criteria at their coastal waters by April 2004.**

History of Recreational Water Quality Criteria



- ▶ Federal bacteria criteria recommendations first made in 1968 by U.S. Public Health Service.
 - Recommended a limit of 200 FC cfu/100 ml
- ▶ In 1970s EPA conducted epi studies at marine and fresh water bathing beaches showing EC and EN better correlation to gastroenteritis than FC.
- ▶ Findings led to EPA's *Ambient Water Quality Criteria for Bacteria - 1986*.
- ▶ *Water Quality Standards for Coastal and Great Lakes Recreation Waters; Final Rule, November 16, 2004.*



Federal Register

Tuesday,
November 16, 2004

Part II

Environmental
Protection Agency

40 CFR Part 131
Water Quality Standards for Coastal and
Great Lakes Recreation Waters; Final Rule

Key BEACH Act provisions:

3. Requires EPA to study issues associated with pathogens and human health and publish new or revised bacteriological criteria.



2012 Recreational Water Quality Criteria for Freshwater

One of two illness rates must be selected:

Criteria Elements	<u>Estimated Illness Rates:</u> 36/1,000 primary contact recreators		<u>Estimated Illness Rates:</u> 32/1,000 primary contact recreators	
Indicator	Geometric Mean (cfu/100 mL)	Statistical Threshold Value (cfu/100 mL)	Geometric Mean (cfu/100 mL)	Statistical Threshold Value (cfu/100 mL)
<i>E. coli</i>	126	410	100	320
Enterococci	35	130	30	110

The illness rates were derived from the NEEAR studies that compared illness rate to WQ as measured by levels of fecal indicator bacteria.

Great Lakes Restoration Initiative (GLRI)

In 2009, President Obama pledged \$475M to address the most significant problems in the Great Lakes:

Toxic Substances and Areas of Concern

Invasive Species

Habitat and Wildlife Protection and Restoration

Accountability, Education, Monitoring, Evaluation, Communication and Partnerships

Nearshore Health and Nonpoint Source Pollution



Great Lakes Restoration Initiative

Nearshore Health and Nonpoint Source Pollution - 87 grants awarded between 2010 and 2012 to address beach health under 5 categories:

Improving Beach Monitoring for Bacteria

Communicating Beach Monitoring to the Public

Developing Beach Forecasting Models

Conducting Beach Sanitary Surveys (identify pollution sources)

Making Beaches Safer (reduce bacterial pollution)



Great Lakes Beaches



Great Lakes Restoration Initiative

Improving Beach Monitoring for Bacteria

Communicating Beach Monitoring to the Public

Developing Beach Forecasting Models

Conducting Beach Sanitary Surveys

Making Beaches Safer



Establishment of Regional Rapid Method Test Facilities in Wisconsin



Project expanded existing lab facilities and established new labs in Wisconsin to have the capacity to analyze beach water samples in under 4 hours using qPCR.

Great Lakes Restoration Initiative

Improving Beach Monitoring for Bacteria

Communicating Beach Monitoring to the Public

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Making Beaches Safer



Beach Advisories through Smartphones: myBeachCast



Download App Beach Health & Water Quality Links & Resources Current Conditions

beach basics

[FAQ](#)
[Links & Resources](#)

what's new?

[Officials evaluate condition of Presque Isle's beaches](#)
Erie Times-News (10/23)
Local, state and federal officials went for a walk on beaches of Presque Isle State Park in Erie, Penn. Erosion, ice and money were concerns

Are there other features or data you'd like to see covered in BeachCast?

Please contact:
manningen@alc.org

This work was funded in part by the Great Lakes Restoration Initiative.



Welcome to Great Lakes **BeachCast!**

This website, enhanced with funding from the [Great Lakes Restoration Initiative](#), broadcasts critical information about beach advisories in the Great Lakes region and related human health information.

Download the app:



With the MyBeachCast mobile app, you can discover local Great Lakes beaches on your location, save favorite beaches, and view real-time information on beach quality advisories, weather, water and wind conditions, and more.

Just click below to download the app from the Apple Store (for iPhone) or Google for Android:



Map current conditions:



Map your favorite beaches to view:

- Beach closings and advisories
- Current weather, water and wind conditions

Great Lakes Restoration Initiative

Improving Beach Monitoring for Bacteria

Communicating Beach Monitoring to the Public

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Making Beaches Safer



Development of Swimcast Models at Chicago Beaches



Great Lakes Restoration Initiative

Improving Beach Monitoring for Bacteria

Communicating Beach Monitoring to the Public

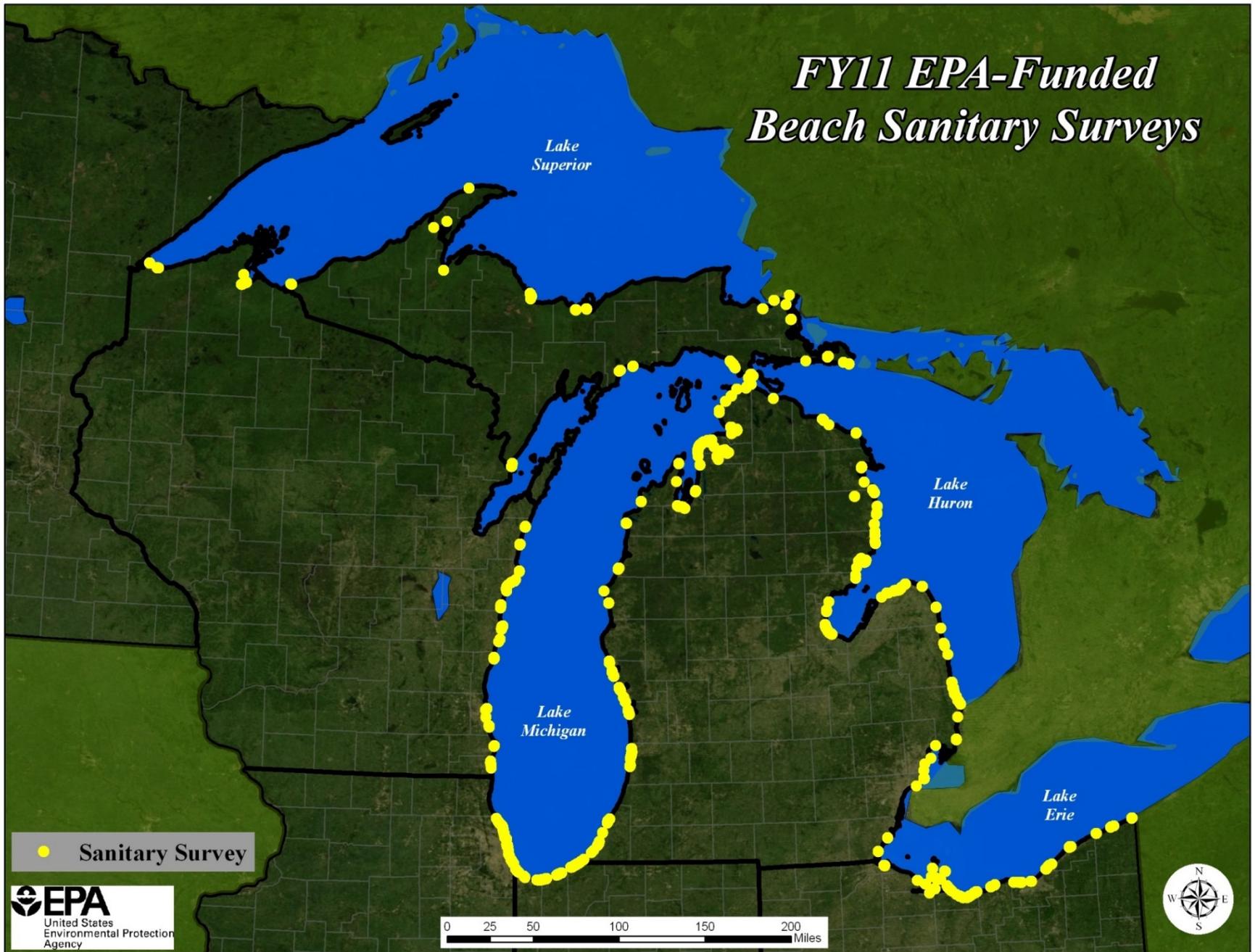
Developing Beach Forecasting Models

Conducting Beach Sanitary Surveys

Making Beaches Safer



FY11 EPA-Funded Beach Sanitary Surveys



Beach Sanitary Surveys



GREAT LAKES BEACH ANNUAL SANITARY SURVEY

1. BASIC INFORMATION

Name of Beach:	Date(s) of Survey:
Beach ID:	Name of Waterbody:
Town/City/County/State:	Number of Routine Surveys Used:
Sampling Station(s) ID:	Name(s) of Surveyor(s):
STORET Organizational ID:	Surveyor Affiliation:

2. DESCRIPTION OF LAND USE IN WATERSHED

Current Land Use in Watershed

Type	Residential	Industrial	Commercial	Agricultural	Other (specify):
Percentage					

Development Describe

% undeveloped	
% developed	

How was land use measured:

Waterbody Uses: Boating Fishing Surfing Windsurfing Diving Other (specify)

Are maps of the beach area attached? yes no Are maps of the watershed attached? yes no

List maps and their sources:

Does the detailed map include locations of:

Sample Points	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Hydrometric Network	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Pollutant Sources	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Boat Traffic	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Maines	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Boat dockage	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Fishing	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Bathing/Swimming	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):

Bounding Structures:

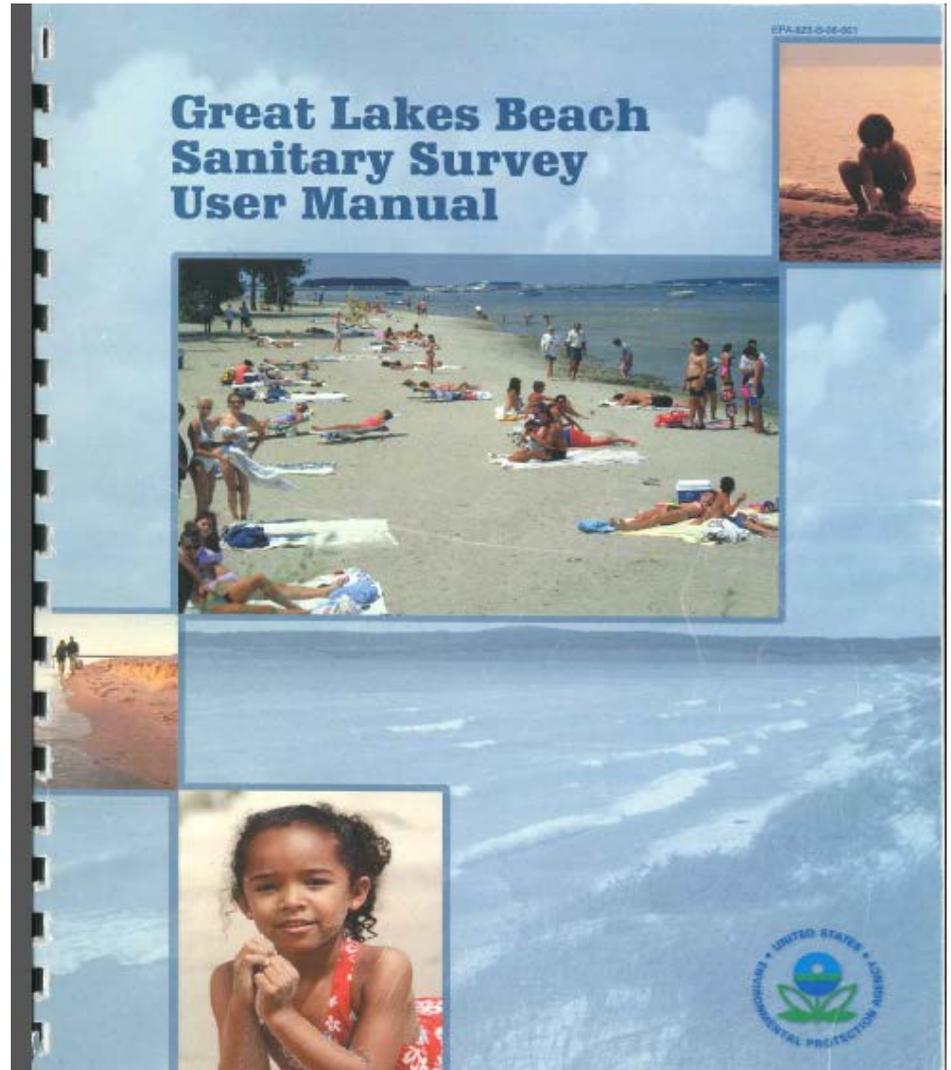
Jetty	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Groin	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Seawall	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Other	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):

Sanitary Facilities

Restaurants/Bars	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Playground	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Parking Lot(s)	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):
Other	<input type="checkbox"/> yes	<input type="checkbox"/> no	(explain):

Erosion/Accretion Measurements

High Watermark Location Identification	Fixed Object Description (e.g., tree, building)	Distance from Fixed Object to High Watermark	Feet or Meters?	Distance between High Watermark Locations	Feet or Meters?
A				A$+$B:	
B				B$+$C:	
C				C$+$D:	
D (optional)				D$+$E:	
E (optional)					



Great Lakes Restoration Initiative

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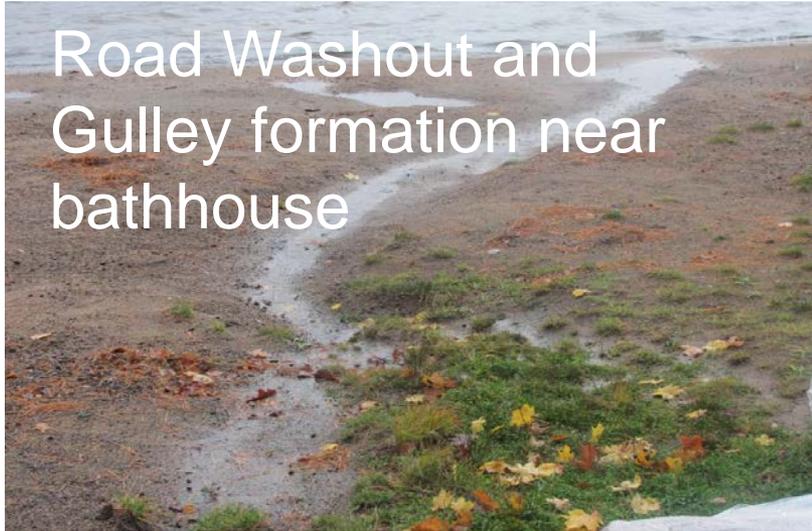
Making Beaches Safer



Egg Harbor Beach and Parking Lot Restoration Project, Door County, Wisconsin



Hancock Beach BMPs Project Houghton County, Michigan



Porous pavers



Curb cut to Rain Garden



Passive Treatment Wetland to Improve Nearshore Health & Reduce Non-point Source Pollution, Oregon, Ohio



Stomping out *E. coli*!





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