Wisconsin’s Beaches: Impacts and Resiliency Overview

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Major Topics

• Water Quality (Kimberly Busse)

• Dangerous Currents and Risk Communication (Todd Breiby – WCMP)

• Harmful Algal Blooms (Mark Warner – DHS)

• Beach Resiliency and Sediment Transport (Gene Clark – UW Sea Grant)
Water Quality

- Monitoring
  - Routine
  - Sanitary Surveys
  - Predictive Modeling
  - qPCR

- Source Tracking
  - Sanitary Surveys
  - Predictive Modeling
  - qPCR
Monitoring Water Quality
Routine Monitoring

- Monitoring recreational water quality
- Inform public health of beach quality
Collecting Water Samples

- Samples collected from center of beach at 24 inches depth 12 inches below the surface
- Sample collected into sterile 100 ml bottle
- *Escherichia coli (E. coli)* and enterococci are indicator organisms of choice
  - Enterococci = salt water
  - *E. coli* or enterococci = fresh water
Rapid Testing Methods

qPCR
- Molecular based testing to evaluate FIB in recreational water
- Results same day as collection
- More expensive than traditional methods
- Requires highly trained staff

Predictive Modeling
- Statistical tool to predict FIB concentrations
- Utilized sanitary survey data to monitor normal fluctuations in water quality and other conditions
- Provides results same day as collection
- Used as another tool for beach managers to evaluate water quality
- Does not predict catastrophic events (i.e. sewage spill)
  - Still important to monitor water quality to validate results
Sources of Beach Water Pollution in the United States - 2012

- Stormwater: 43.3%
- Wildlife: 28.1%
- Sewage Overflow: 18.6%
- Unidentified Sources: 10.0%

Source Tracking
Sanitary Surveys

- To explore and accurately characterize Great Lake Beaches in terms of possible sources of microbial pollution entering the beach area.
What are Sanitary Surveys?

- Affordable, simple tool to evaluate sources of fecal pollution
- Routine Sanitary Survey (RSS)
  - 2-page form for recording environmental conditions and pollutants on the beach
- Annual Sanitary Survey
  - 8-page form for recording physical beach conditions and watershed characteristics
Contributors to Poor Water Quality

Data from a subset of 10 beaches in WI. Data collected from 2010-2012.
DNA Fingerprinting and qPCR

- Molecular testing to verify sanitary survey results by identifying specific sources
- Source specific – using molecular based techniques
- Very powerful tool once sources are narrowed
Leads to Healthier and Safer Beaches