Illinois
Lake Michigan Beaches
TMDL

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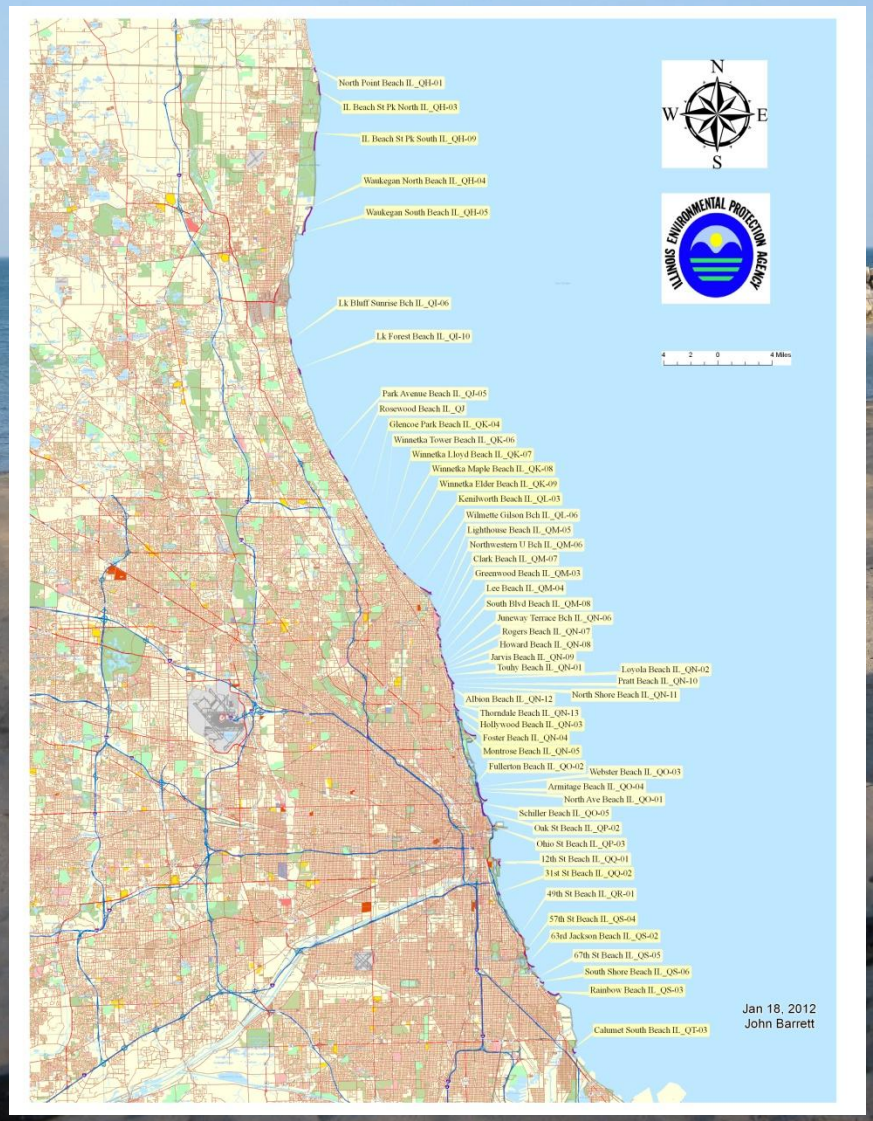
3/27/2012

Grouping the Beaches



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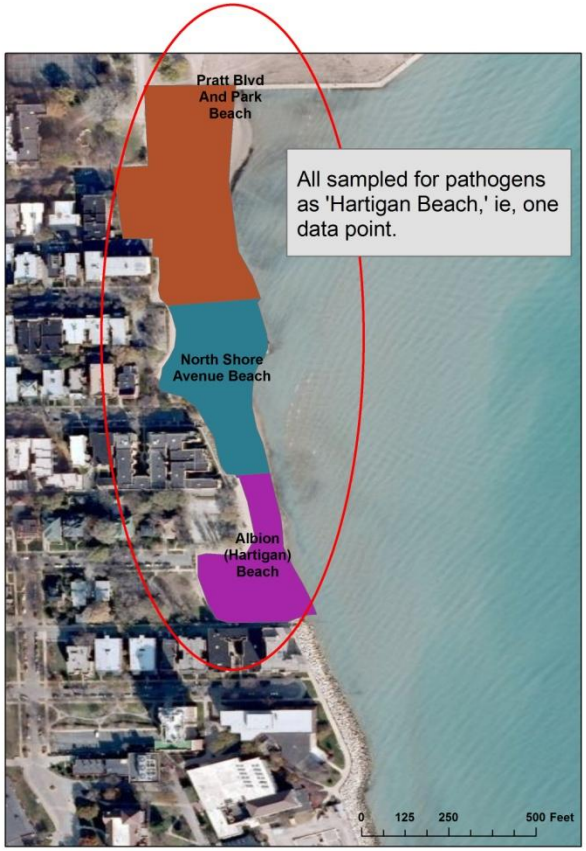
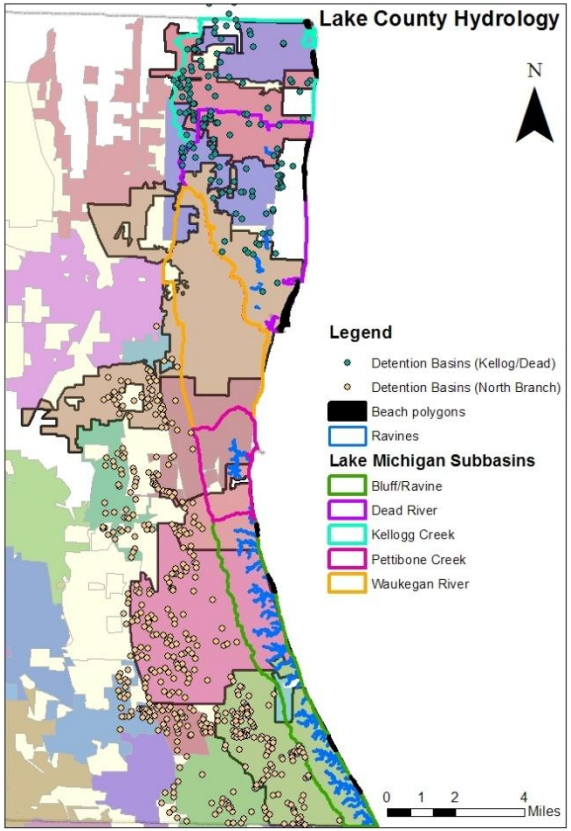
Why group?



- Make more efficient usage of the available data
- Similar beaches can use similar treatments
- Economy of scale

Why Group?



- Neighboring beaches may be able to share resources
- So that efforts on one beach do not drive problem to another

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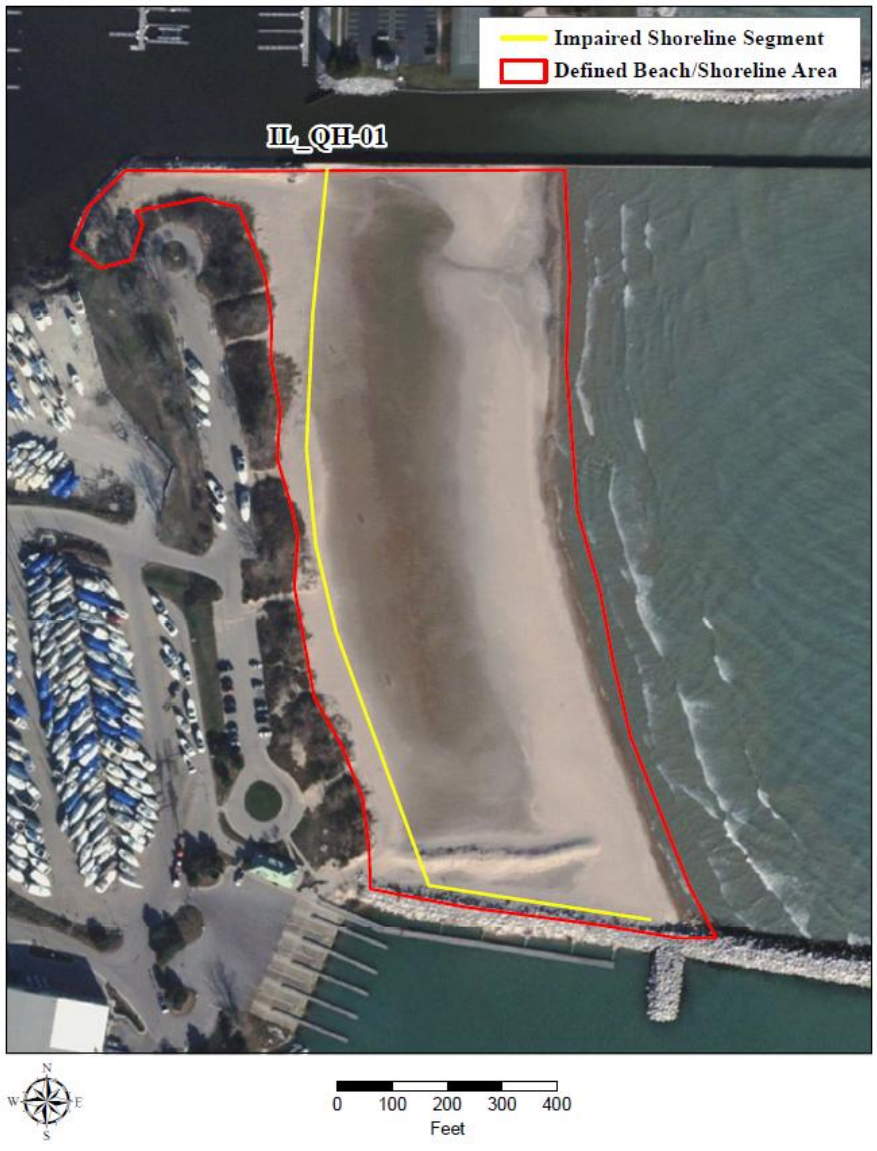
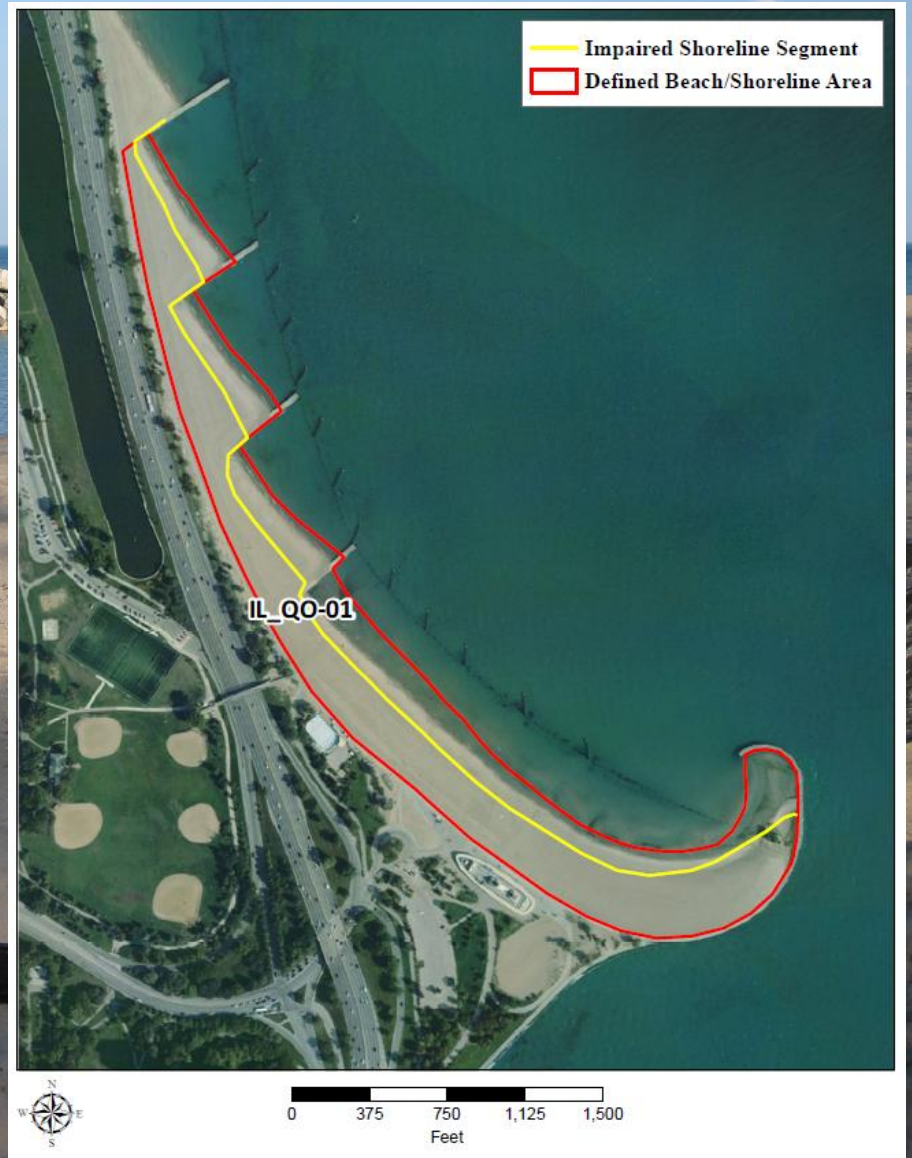
Beach Definitions

North Point Marina Beach



North Avenue Beach



Parameters Used in Statistical Model

Surrogate	Metric	Surrogate For	Manageable Parameter	Method
Known/Assumed Sources				
Number of gulls	Count	Bacteria in bird fecal matter	X	Egg oiling; dog patrol
Number of beach goers	Count	Human sources; Disturbance of sediments	X	Fees; restrictions?
Area of specific land use class (e.g., area of high density residential land)	Area	Depending on land use bacterial sources	X	Sewering; BMPs; Ravine restoration
Point source loading	Magnitude	Direct source loading	X	Load reductions
Bypass	Type or Magnitude	Direct source loading		Accounted for in study, but a specific WLA will not apply to this source
Physical Influences				
Beach slope	Magnitude	Potential for greater slosh zone	X	Grading
Embayment	Type	Effects of hydrodynamics	X	Alteration of jetties, walls, etc.
Substrate	Type	Potential for bacterial attachment and growth	X	Beach supplementation
Hydrometeorological Influences				
Precipitation magnitude (e.g. previous 24 hours)	Magnitude	Washoff		
Days/hours since rain event	Temporal	Build-up		
Air or water temperature	Magnitude	Bacterial growth and die-off		
Wind direction	Type	Influence of Lake Michigan off-shore waters		
Lake Influences				
Wave height	Magnitude	Resuspension from slosh zone		
Current velocity	Magnitude	Influence of Lake Michigan off-shore waters		
Current direction	Type	Influence of Lake Michigan off-shore waters		

Load or Concentration TMDL

- Most of the Illinois TMDLs will tell you that you can have so many pounds of bad stuff per day

- This TMDL is different in that it will tell you that you can have so many colony forming units per milliliter

Why This Proposed Method

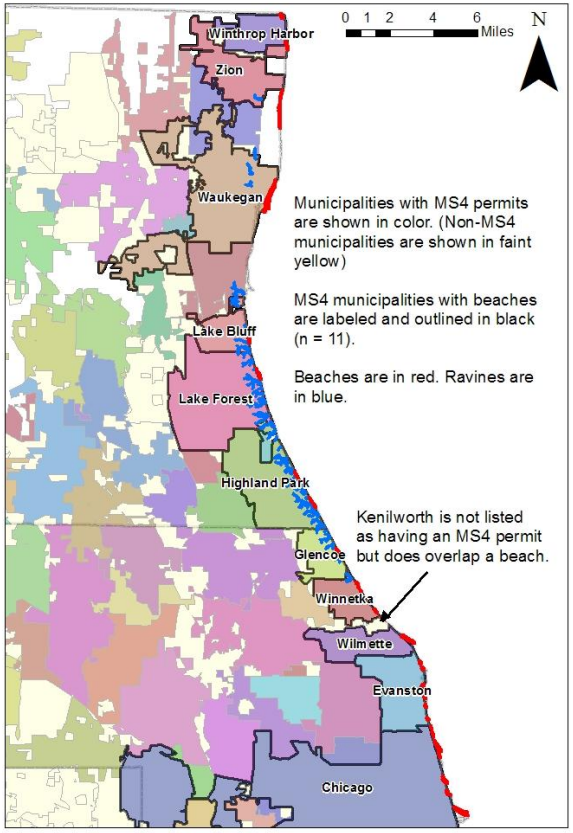
1. Use extensive monitoring data to establish distributions of *E. coli* concentrations

2. Create statistical model(s) that use measurable source surrogates (e.g. concentrations, magnitudes, areas) to best estimate the distribution of *E. coli* concentrations from monitored data

3. Calculate shift in distribution needed to meet the WQS with a chosen level of certainty

4. Calculate the relative reductions in source surrogates needed to recreate the shifted distribution with statistical model(s)

Localities with MS4 Permits



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Benefits to Method

- Assumptions in loadings and sources limited in favor of determining statistically significant influences of measured parameters/ surrogates on *E. coli* concentrations
- Seasonality and critical conditions explicitly accounted for
- Loading capacity and MOS directly determined through quantification of uncertainty in monitored *E. coli levels*
- Relative contributions from variety of sources can be calculated; also considers physical constraints of beaches and influence of Lake Michigan
- Utilizes all available monitored data (including sanitary surveys)
- Provides 51 TMDLs in cost-effective and timely manner
- Implementation options can be explicitly linked to relative reductions, are specific for each beach, and are easily understood

Implementation Plans

- Permit changes
- How home owners can control run-off from their property
- How Park Districts can control run-off
- Control of wildlife in the area
- Litter control
- Beach grooming
- Gull Control

When?

July 2012 – final date for acceptance of any new data

Late Summer 2012 – completion of modeling

Fall 2012 – preparation of public notice TMDL documents

Late Fall 2012 – Illinois EPA review of public notice TMDLs

Early 2013 – Public notice of TMDLs

Spring 2013 – Response to comments and TMDL finalization

May 2013 – TMDLs to U.S. EPA for approval

The overriding idea is to keep as many people healthy as we can while maximizing everyone's fun day at the beach

No matter what you want to do there!