

Annual Sanitary Survey

1. BASIC INFORMATION

Name of Beach: Zoo Beach	Date(s) of Survey: May 25, 2007 to October 18, 2007
Beach ID: WI988510	Name of Waterbody: Lake Michigan
Town/City/County/State: Racine, Racine County, WI	Number of Routine Surveys Used: 72
Sampling Station(s)/ID: Z1 (northernmost) - Z3 (southernmost)	Name(s) of Surveyor(s): S. Kurdas, E. Junion, A. Koski, J. Kinzelman
STORET Organizational ID: WIBCH43	Surveyor Affiliation: City of Racine Health Department

2. DESCRIPTION OF LAND USE IN WATERSHED

Current Land Use in Watershed

Type	Residential	Industrial	Commercial	Agricultural	Other (specify):
Percentage	36.2%	6.0%	6.9%	0%	Transport/Comm/Util = 23.4% Gov't/Institutional=6.4%, Recreational=7.6% Open lands=7.1%, Wetlands=1.1%, Woodlands=1.4% Surface Water=1.3%, Landfill=6.4%

Development	Describe
% undeveloped	10.9% (Wetlands, Woodlands, Open lands, Surface Water)
% developed	89.1% (Residential, Industrial, Commercial, Transportation, Communication, Utility, Gov't, Institutional, Recreational, Landfill)

How was land use measured: Acres

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: Racine GIS, Google Earth, Racine Health Department photos

Does the detailed map include locations of:

Sample Points	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): Sampling Points Z1, Z2, Z3
Hydrometric Network	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): USGS Root River #04087240, 5.2 miles upstream from mouth
Pollutant Sources	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): Root River, Storm water outfalls @ English, Goold & Augusta Streets
Boat Traffic	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no	(explain): Traffic moves freely in near shore and off shore areas
Marinas	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): Racine Yacht Club, Pugh's Marina south of beach
Boat dockage	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): Yes, Rooney Recreational Area south of beach
Fishing	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no	(explain):
Bathing/Swimming	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): Public bathing beach

Bounding Structures:

Jetty	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no	(explain):
Groin	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): Series of 5 groins form northern boundary of Zoo Beach
Seawall	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no	(explain):
Other	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): Steep bluff comprises western boundary of beach area
Sanitary Facilities	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no	(explain):
Restaurants/Bars	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no	(explain):
Playground	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): Lakeview Park is on top of bluff
Parking Lot(s)	<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no	(explain):
Other	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	(explain): Lake Michigan Pathway (bike trail) west of beach, below bluff

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 (Z1)	Edge of beach grass to west	87.0	Feet	A↔B: 391.0	Feet
B (Z2)	Edge of beach grass to west	97.0		B↔C:	
C				C↔D:	
D (optional)				D↔E:	
E (optional)					

How were distances measured? Measuring tape By Pacing Using a Map Estimated Other (specify)

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Other Weather yes no (explain):

Have any statistical analyses been done to calculate the degree of correlation? yes no

Describe any analyses done, and any trends or correlations found (add lines if needed to describe in detail):

Average air temperature during beach season: _____ ° C Average water temperature during beach season: _____ ° C

Average wind speed and direction during beach season (e.g., E or 90° at 15 mph):

Typical weather conditions: Sunny Mostly Sunny Partly Cloudy Mostly Cloudy Overcast Rainy

Rainfall total for the beach season (in): _____ Average rainfall for all beach seasons (in): _____

Number of significant rain events:	What constitutes "significant?" (e.g., 1 inch or more rain)
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Additional Comments/Observations:

4. PHYSICAL BEACH CONDITIONS

Beach length or dimensions (indicate Z1, Z2, and Z3 on a map)

Length (m): _____ Width (average, in m): _____

Width Z1 (m): _____ Width Z2 (m): _____ Width Z3 (m): _____

Local water level variation: _____ feet _____ inches Hydrographic influences (e.g., seiches):

Characterize any longshore or nearshore currents and their potential effects based on bacteria sampling results

Approximate beach slope at swim area: _____ %

Description and date of last beach rehabilitation (example: new sand, nourishment, dredging, etc., physical structures will be described in Sections 12 and 13):

Comments/Observations:

5. BATHER LOAD (# OF BEACH USERS)

Is bather load measured? yes no

If yes, describe how beachgoer numbers are calculated (i.e., turnstile, counting at noon, photographs):

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Beach Use

Beachgoer Category	Number of People Per Day Using the Beach					
	Peak Use for the Season (Daily Use)	Seasonal Average (Daily Use)	Holiday Average (Daily Use)	Weekend Average (Daily Use)	Weekday Average (Daily Use)	Off-Season Average if applicable (Daily Use)
Total beach users						
People in the water						
People on beach but not swimming						
People boating						
People fishing						
People surfing						
People windsurfing						
People diving						
People clamming						
Other (specify):						
Frequency of measurements (e.g., biweekly, weekly, monthly)						

Examine bather load data along with sampling results for the past beach season(s). Look at each sampling point. Does bather load appear to correlate with bacteria concentrations at any of these sampling points? Has a statistical analysis been done? Describe:

Comments/Observations:

6. BEACH CLEANING

Beach cleaning frequency during season:

Description of cleanup activities

	Leveling of Sand	Trimming or Removing Vegetation	Removing Debris	Removing Trash	Construction and Maintenance of a Temporary Pathway Directly to Open Water	Other (specify):
Check activities that were done						
Equipment used (if applicable)						

How often is beach debris/litter found on the beach? Never Sometimes Frequently Very frequently

Known sources of debris:

Types of debris/litter found (animal waste is addressed in Section 8): T Tar T Oil/Grease T Trash T Plastic

T Medical waste T Other (describe):

Comments/Observations:

ANNUAL SANITARY SURVEY (continued)

7. INFORMATION ON SAMPLING LOCATION

Description of Sample Points

Sample Point Name/ID	Location	Description	Sample Frequency	Time of Day of Sample Collection

Description of hydrometric network [note that this is a network of monitoring stations that collect data such as rainfall and stream flow]

Comments/Observations:

8. WATER QUALITY SAMPLING

Name of laboratory: _____ Distance to laboratory: _____ miles

Is there a sampling and analysis plan? yes no Is it adequate? yes no (explain): _____

Are the sampling staff properly trained on sampling techniques, equipment maintenance, and calibration procedures? yes no

Biological Survey Results:

Were invasive/nonnative species present? yes no (describe): _____

Have algae blooms been observed during the beach season? (If so, specify duration and algae species) _____

Percent of beach season where algae was present in significant amounts in the nearshore water: None Low (1-20%)

Moderate (21-50%) High (> 50%)

Percent of beach season where algae was present in significant amounts on the beach: None Low (1-20%)

Moderate (21-50%) High (> 50%)

List any infectious snails that were found: _____

List any dangerous aquatic organisms that were found: _____

Presence of Wildlife and Domestic Animals

Type	Degree of Presence (Low, Mod, High)	Does the Presence Appear to Correlate with Bacteria Results? (Yes, No, Don't Know)	Describe Further (include whether fecal droppings are seen and are a problem)
Geese			
Gulls			
Dogs			
Other (specify):			
Other (specify):			
Other (specify):			

ANNUAL SANITARY SURVEY (continued)

Bacteria Samples Collected

Do you test for *Escherichia coli*? yes no Analytical Method Used: _____

Do you test for *Enterococcus*? yes no Analytical Method Used: _____

Do you test for fecal coliform? yes no Analytical Method Used: _____

List any additional bacteria tested and associated analytical methods: _____

Do you composite any bacteria samples? yes no If yes, explain: _____

How do this past season's bacteria results compare to that of previous years? _____

Do the bacteria results correlate to other parameters, such as water quality, weather, flow, bather load, algae, or wildlife? yes

no Describe in detail analyses that were performed on the data (add additional lines as needed).

Water Quality (check all that are measured regularly)

Temperature	pH	Rainfall	Turbidity	Conductivity	Other

How does the water quality data compare to data from previous years? _____

Do any data correlate with bacteria sample results? yes no If yes, explain: _____

Were there any unusual results, such as extremely high or low values detected, or unusual trends? yes no If yes, explain what was found and any potential causes: _____

Are water quality annual trend data attached? yes no

Comments/Observations:

9. MODELING

Are models being used to predict the exceedance of bacteria standards? yes no

If yes, list types of models being used and a brief description of the models:

ANNUAL SANITARY SURVEY (continued)

Type of Source	Level of Concern (H, M, L, or NA)	Latitude*	Longitude*	Describe how this source might contribute to beach pollution and frequency of contribution
Erosion-prone areas				
Landfills, open dumps				
Groundwater seepage				
Bathroom leakage				
Drains and pipes nearby				
Stream or wetland drainage				
Vacant areas				
Other (specify):				
Other (specify):				
Other (specify):				

*If latitude and longitude are unknown, show the location on the detailed map and describe in the Comments/Observations section below.

Have potential pollutant sources identified above been included on the detailed map? yes no (explain):

Are there any discharge reports available for dischargers in the watershed? yes no If yes, attach report or pertinent sections and summarize here:

Have any sources been remediated, or have steps been taken to remediate sources? yes no (explain):

Comments/Observations:

ANNUAL SANITARY SURVEY (continued)

12. DESCRIPTION OF SANITARY FACILITIES

Bathhouses: Total number of bathhouses at the beach:

Number or ID	Location	Condition (Good, Fair, or Poor)	Distance from Beach (feet)	Frequency of Cleaning (Daily, Weekly, Monthly)

Describe further. Include number of toilets, showers, sinks, etc., and whether these facilities are adequate to support beach use.

Litterbins: Total number of litterbins at the beach:

Number or ID	Location	Condition (Good, Fair, or Poor)	Distance from Beach (feet)	Frequency of Emptying (Daily, Weekly, Monthly)

Describe further. Include whether number and location of litterbins is adequate to support beach use.

How were distances from the bathhouses or litterbins to the beach measured? Measuring tape By pacing
 Using a map Estimated Other (specify)

13. DESCRIPTION OF OTHER FACILITIES

List facilities in the beach area, such as restaurants, bars, playgrounds, parking lots, and dog parks.

Facility Name/Type	Location	Condition (Good, Fair, or Poor)	Distance from Beach (feet)	How might this facility contribute to water quality problems?

Comments/Observations:

How were distances from the other facilities to the beach measured? Measuring tape By pacing
 Using a map Estimated Other (specify)