

Samuel Meyers Park – Racine, WI

Location

Samuel Meyers Park is located along the shore of Lake Michigan in Racine, Wisconsin. The area has been officially designated as a public bathing beach by the WI DNR since at least 2002. The park is comprised of turf grass open space fronting Pershing Boulevard which transitions to a sandy area (formerly lakebed). Sam Meyers Beach sits in a 0.7 mi-long embayed basin that has numerous potential E. coli sources. In addition to these sources, little was known of the hydrodynamic processes in the basin, which further added to the complexity of determining contamination sources.

Sources of Pollution

Environmental conditions adversely impacting water quality include: siltation due to poor circulation, lack of beach gradient, presence of nuisance algae, intense waves, water fowl, surface runoff, stormwater discharge (four storm water outfalls discharge from a bluff west and perpendicular to the beach), beach sediments and Cladophora.

Major Findings:

There is a significant correlation between E. coli density and 24-hour and 48-hour antecedent rainfall, but bacteria counts are also elevated in the absence of precipitation, indicating that wet weather sources are not solely responsible for poor water quality.

The total number of birds on the beach was correlated to E. coli levels.

Dry weather storm water discharge intermittently had detectable levels of detergents and high E. coli levels which indicates the possibility of sanitary intrusion into the stormwater infrastructure. High amounts of litter were frequently noted on the beach, especially after rain events, also indicating a potential stormwater source.

E. coli concentrations were extremely elevated in beach sands, especially at the berm crest, and in locations that consistently had algae buildup and/or evidence of birds.

There is only a 3% change in elevation facilitating significant wave run up, or possible seiche effects, allowing significant amounts of water to traverse the beach area.

Water quality, at depths of 36" and 48", was significantly better than at 12" and 24" depths (Table 1). This indicates that there is a significant difference with respect to FIB concentrations as a

function of depth zone. Due to circulation patterns, near shore waters are, therefore, more significantly impacted by pollution sources.

Low wave energy (also because of the embayed nature), minimizes mixing of the more shallow waters with depths of greater than 36".

Table 1. Samuel Meyers Multi-Depth Sampling Season Average and Median <i>E. coli</i> Results (MPN/100 mL) at SM1-3 at 12", 24", 36", and 48" Depths												
	SM1-12"	SM1-24"	SM1-36"	SM1-48"	SM2-12"	SM2-24"	SM2-36"	SM2-48"	SM3-12"	SM3-24"	SM3-36"	SM3-48"
Avg	1,929	528	100	68	3,423	270	97	80	4,524	3,711	111	51
Med	563	85	58	25	297	26	36	25	1,173	154	20	26
Averages and Medians are calculated from 8 multi-depth sampling events conducted bi-weekly from 6/28-9/28/10. All values are rounded to the nearest whole number.												
Advisory Level (236-999 MPN/100 mL)												
Closure Level (\geq 1000 MPN/100 mL)												

Recommendations

Mitigation of pollution sources and best management practices at Samuel Meyers Park should include:

Remove the shallow waters (12 – 24" depth) from the official list of public bathing beaches and create an offshore "beach" (48" or greater; swimmers were typically observed entering the water from boats rather than the shore).

Address the accumulation of algae, litter and other undesirable debris.

Delineate the wetland areas, expand if necessary for the mitigation of surface runoff, and remove invasive species.

Increase the slope of the beach to reduce the interaction between sediments and the near shore waters of Lake Michigan.

Encourage dune formation to further reduce the impacts of stormwater runoff from the boat launch and turf grass areas of the park.

Prohibit motorized vehicles from driving onto the beach.

Find an alternative location for launching motorized watercraft; permit canoe and kayak launches. Focus of future beach sanitary survey assessments:

Continue event-based sampling of the 16th Street and 15th Street storm water outfalls to determine if infrastructure improvements are necessary to improve surface water quality.

Conduct one or two days of full basin sampling in 2012 to provide insight on the hydrodynamic processes within the embayment, in conjunction with spatially distributed multi-depth sampling, in

order to determine the best placement for an offshore swim zone.

Redesign Plan

Samuel Myers Park was dedicated on May 19, 1984 as a lakefront amenity for the citizens of Racine and to encourage tourism. Although underutilized in its current state, the City of Racine feels that this location is integral to Racine's downtown economic development. They also feel a responsibility to improve and protect the water resources within their jurisdiction. Therefore, the conceptual beach redesign includes features both protective of water quality and appropriate for the benefit of the greatest number of people within the Racine community who will have access to this site. The design is innovative, restorative, inclusive, sustainable, and is projected to materially improve water quality.

The Rotary Club of Racine seeks partnership with the City of Racine in charting an attractive and sustainable future for Samuel Meyers Park. They wish to celebrate the historic importance of Racine as the birthplace of Rotary's founder as well as reflect Rotary's commitment to water and wetlands conservation and environmental sustainability. In 2009, they engaged the firm of Arnold and O'Sheridan, Inc to provide a concept master plan for the park. The master plan includes, among other items: a children's playground area, a pavilion, three discreet areas of native vegetation (to replace segments of turf grass), retention of the current wetland area, all interspersed with a series of walking paths/boardwalks. The areas of native vegetation will provide habitat for desirable avian species; this park has been designated as a bird fly over area. If funded, the Rotary Club could bring up to \$60,000 in support of this effort.

The proposed redesign, developed by Miller Engineers and Scientists, integrates the Rotary master plan, and transitions to features which: restore habitat (native vegetation), deter nuisance waterfowl (sand dunes, marsh grasses), retain/infiltrate surface water runoff (wetlands), increase the elevation of the beach, and provide beach access across all segments of potential users (including ADA compliant foot paths and a walk-in non-motorized personal watercraft launch). The native vegetation and sand dunes will attract desirable avian species for birding while deterring gulls, geese and other species linked to poor water quality. The change in elevation in conjunction with the series of constructed wetlands will retain and infiltrate stormwater passing from the turf grass area. The series of footpaths will take visitors on a tranquil, educational journey through a restored beach ecosystem. The offshore swim zone will accommodate the needs of those arriving to Samuel Meyers Park by boat (the most frequent swimmers) as well as provide assurance of water quality during events (i.e. Dragon Boat races) based on sanitary survey data which indicates that water quality at depths of greater than 36" meets US EPA standards for recreation.

The City of Racine will, in order to reclaim and sustainably manage this resource, develop a scheduled maintenance plan which may include as appropriate: routine recreational water quality monitoring, deep beach grooming, placement of additional waste cans with more frequent emptying, footpath maintenance, invasive species control (with volunteer support from Weed-Out Racine, Gateway Technical College, and/or other civic minded organizations), and the delineation of an offshore swimming area. The revitalized Samuel Meyers Park, when complete, will include an outdoor arboretum, walk-in boat launch for canoes/kayaks, and offshore swim area. This innovative approach will create a beach environment that is adaptive to the resource and capable of meeting EPA water quality standards for primary recreation.