Beaches to be tested more often

State plan calls for better monitoring of water quality

By DON BEHM
dbehm@journalsentinel.com

Posted: Jan. 21, 2003

Beginning this summer, water quality at 170 beaches on Lake Michigan and Lake Superior will be tested for disease-causing organisms more frequently than ever before, under a plan to be announced at the end of the month.

From Racine to Door County to Bayfield, local public health officials will be offered federal funds to encourage them both to expand testing of the waters and to alert the public to possible contamination at popular swimming areas, said Toni Glymph, an environmental toxicologist with the state Department of Natural Resources in Madison.

"People need to know the risks of going into the water," Glymph said. "But a lot of beaches haven't been monitored in the past. Monitoring was done at the main Door County beaches in 2002 only after an outbreak of illnesses in July."

In 2002, more of Wisconsin's Lake Michigan beaches were closed more frequently than in the past. But researchers still have little insight into the sources of the unexpectedly widespread contamination.

High levels of E. coli bacteria in water prompted warning signs to be posted a record number of times at three Milwaukee beaches - 50 days at South Shore out of the 65-day season, 21 days at Bradford and 23 days at McKinley. Signs advising swimmers not to go into the water were put up on 41 days at Klode beach in Whitefish Bay.

For that reason, Glymph said she was not surprised that residents preferred to talk about possible sources, rather than the monitoring plan, at recent meetings held at Racine, Milwaukee, Green Bay and Sturgeon Bay.

But help is on the way.

New study of contaminants

Research scientists at the University of Wisconsin-Milwaukee are beginning a groundbreaking study that will provide answers to the persistent question: where did the contaminants come from?

The Milwaukee Metropolitan Sewerage District has awarded a $772,000 grant to the Wisconsin Aquatic Technology and Environmental Research Institute for a three-part study of water quality in the lower Milwaukee River and harbor.

First, scientists at the research center, more commonly known as the Great Lakes WATER Institute, will show where the bacteria come from "other than the obvious sewer overflows," said Chris Magruder, MMSD community environmental liaison.

Second, the scientists, in cooperation with engineers from MMSD and consulting firms, will track the spread of bacteria out of the confluence of the Milwaukee, Menomonee and Kinnickinnic rivers and into Lake Michigan. "This will show us how they move from the rivers to the harbor and shoreline," Magruder said.

Finally, the study will observe the fate of bacteria in the harbor and in water along the shoreline.

The study also should determine, once and for all, whether sewer overflows in Milwaukee could contaminate beaches in Chicago.

The groundbreaking nature of the research, however, comes from the set of tools employed to identify sources, according to Magruder.

A triple-play combination - genetic makeup of E. coli bacteria, antibiotic resistance of the bacteria, and the presence of caffeine in water samples - will clarify potential sources, said Sandra McLellan, an assistant scientist at the WATER Institute.

McLellan and other scientists in her laboratory have been identifying numerous strains of E. coli from human sewage, gull droppings, cattle manure, and dog feces. E. coli comes only from the intestines of warmblooded animals and can indicate fecal contamination of water.

Distinct genetic 'fingerprints'

Strains from each host have evolved with distinct genetic "fingerprints," or sequences of DNA. Those with similar fingerprints are recognized as coming from a particular host species, McLellan said.

She began assembling this piece of the puzzle more than two years ago when her laboratory first studied E. coli at South Shore Beach. Her finding: Gulls at the beach and nearby parking lot are the largest source of E. coli bacteria to shoreline water.

Her database of E. coli genetic profiles will guide all future water quality studies here and in other shoreline communities.

The reason is that the DNA fingerprints of E. coli removed from a water sample can be compared to her collection. Then, McLellan can identify the bacterium's host, which is close to pinpointing a source.

In addition to continuing her work on genetic profiles in the next study, McLellan's team this year also is looking for evidence of antibiotic resistance among E. coli and the presence of caffeine.

The presence of either would indicate human waste in water.

From the Jan. 21, 2003 editions of the Milwaukee Journal Sentinel
Have an opinion on this story? Write a letter to the editor.