



News Release

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U.S. Geological Survey

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Note to editors: This news release can be viewed online at <http://oh.water.usgs.gov>.

Pilot Study at Huntington Beach, Ohio Nowcasting Beach Safety Advisories

Before you head to Huntington Beach, check the Nowcast on <http://www.ohionowcast.info>.

This summer, the U.S. Geological Survey (USGS) and the Cuyahoga County Board of Health are testing a system to quickly estimate bacteria levels and provide beach advisories to swimmers headed to Huntington Beach in Bay Village, Ohio. By 9:30 each morning the Nowcast will be posted for the day, enabling swimmers to access advisory information before they leave for the beach.

“The Nowcast system is similar to a weather forecast except current conditions instead of future conditions are estimated,” said Donna Francy, USGS research hydrologist for the study. “Current bacteria levels are estimated using a computer model especially calibrated for Huntington Beach, which takes into account current weather and environmental conditions.”

Beach advisories or closings in the United States are issued when levels of bacterial indicators, such as *Escherichia coli* (*E. coli*), exceed safety standards. *E. coli* is found in the intestines and feces of warm-blooded animals. Indicator organisms do not necessarily cause disease, but they are present in sewage and waste and indicate the possible presence of disease-causing organisms. If the concentration of *E. coli* exceeds state standards, officials will advise visitors not to swim because of the risk of illness.

Unfortunately, current methods to determine levels of *E. coli* take at least 18 hours to complete. During this period, *E. coli* levels may increase or decrease substantially. A heavy rainfall may cause an increase in *E. coli* levels overnight. A bright sunny day may cause *E. coli* levels to fall. So, the beach may be erroneously posted with an advisory based on measured *E. coli* levels from the previous day.

“We collected weather and environmental data for six years to develop mathematical models to predict *E. coli* concentrations at Huntington Beach,” said Francy. “Instead of waiting 18 hours for *E. coli* to grow in the laboratory, we use quickly measured factors that explain changes in *E. coli* concentrations, enter them into a computer program, and obtain a Nowcast of recreational water quality in less than 2 hours.”

For Huntington Beach, USGS scientists found that wave height, rainfall in the past 48 hours, turbidity (water clarity), and day of the year were the best factors to estimate *E. coli* levels.

USGS scientists developed models for other Lake Erie beaches and discovered that the determining factors vary; no two beaches are the same. Lakeview Beach (Lorain), Edgewater Beach and Villa Angela Beach (Cleveland), and Lakeshore Beach (Ashtabula) each require a unique combination of weather and environmental factors to estimate bacteria levels.

The models predict the probability of exceeding the Ohio single-sample maximum bathing-water standard for *E. coli* (235 colonies per 100 milliliters). For Huntington Beach, the threshold probability is 27 percent. Probabilities equal to or more than the threshold indicate that the water quality is probably unacceptable and a water-quality advisory will be issued. This “threshold probability” varies by beach.

“We are very pleased with the USGS model and the Web-based Nowcast system,” said Jill Lis, Program Manager for the Cuyahoga County Board of Health. “The tools allow us to base water-quality advisories on today’s conditions rather than yesterday’s, thus preventing potential exposure to waterborne pathogens. And they help officials protect and inform the public in a timely manner. We are proud to be the first in Ohio to offer this service to the public.”

“If the Huntington Beach model does well in estimating bacteria levels and the Nowcast Web site proves to be a useful system, we will continue using it at Huntington Beach and expand its use to other beaches in 2007,” Francy said.

The Ohio Lake Erie Office, Ohio Water Development Authority, and Northeast Ohio Regional Sewer District also cooperated in this study.

The USGS serves the nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

The Cuyahoga County Board of Health serves to prevent disease and injury, promote positive health outcomes, and provide critical services to improve the health status of the community.

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