



**2011 BATHING BEACH  
MONITORING & NOTIFICATION PROGRAM RESULTS**

## **Introduction**

Ohio conducts a monitoring and notification program of identified public and semi-public beaches located along the Ohio/Lake Erie border. The goal of the program is to monitor the water quality of the state's bathing beach waters and to notify the public whenever bacteria levels present a potential health risk to bathers. The program involves the efforts and cooperation of multiple state and local health agencies and organizations. The Ohio Department of Health (ODH) coordinates the state effort and is responsible for the successful management of the program.

There are 62 public and semi-public beaches that are monitored every season by ODH and our partners. The Ohio Department of Natural Resources (ODNR) published "Ohio's Lake Erie Public Access Guidebook" in 2010. This guidebook revealed that there are 164 points of public access to Lake Erie in Ohio and "nearly 53 miles of publicly accessible shore."<sup>1</sup> Currently all identified beaches are monitored weekly and the majority of beaches are sampled a minimum of four times per week.

The BeachGuard web-based reporting system was successfully installed and went 'live' in June. A press release was distributed state-wide and several media outlets ran a story on the updated and interactive website. As a result of the outreach efforts, program staff were contacted by Avon Municipal Sewer District regarding two beaches on the Lake Erie shore that they monitor. These beaches were added to the BeachGuard system but have not been added to the list that the ODH submits to the US EPA as part of the beach monitoring and notification program. The ODH and Avon Municipal Sewer District are discussing the possibility of collecting the necessary information for inclusion in the beach program. The website is located on the internet at: [www.odh.ohio.gov/healthybeaches](http://www.odh.ohio.gov/healthybeaches). The ODH received many positive comments on the new notification system.

## **Monitoring**

The normal beach season in Ohio runs from Memorial Day to Labor Day. In 2011, the ODH contracted with four local health districts, Ottawa County, Erie County, Cuyahoga County and Lake County and the University of Toledo, to conduct the monitoring and notification program. This was the first year that all monitoring and notification activities occurred locally since the ODH has managed this program. Sampling frequency along the Lake Erie shoreline remained the same as last year with a few exceptions. The beaches in Cuyahoga County were re-sampled this year when the first sample exceeded the standard. The beaches in Lorain City were monitored seven days per week to collect data to develop the NOWCAST predictive model for future use at those beaches.

Table 1 indicates the sampling frequencies:

**Table 1**

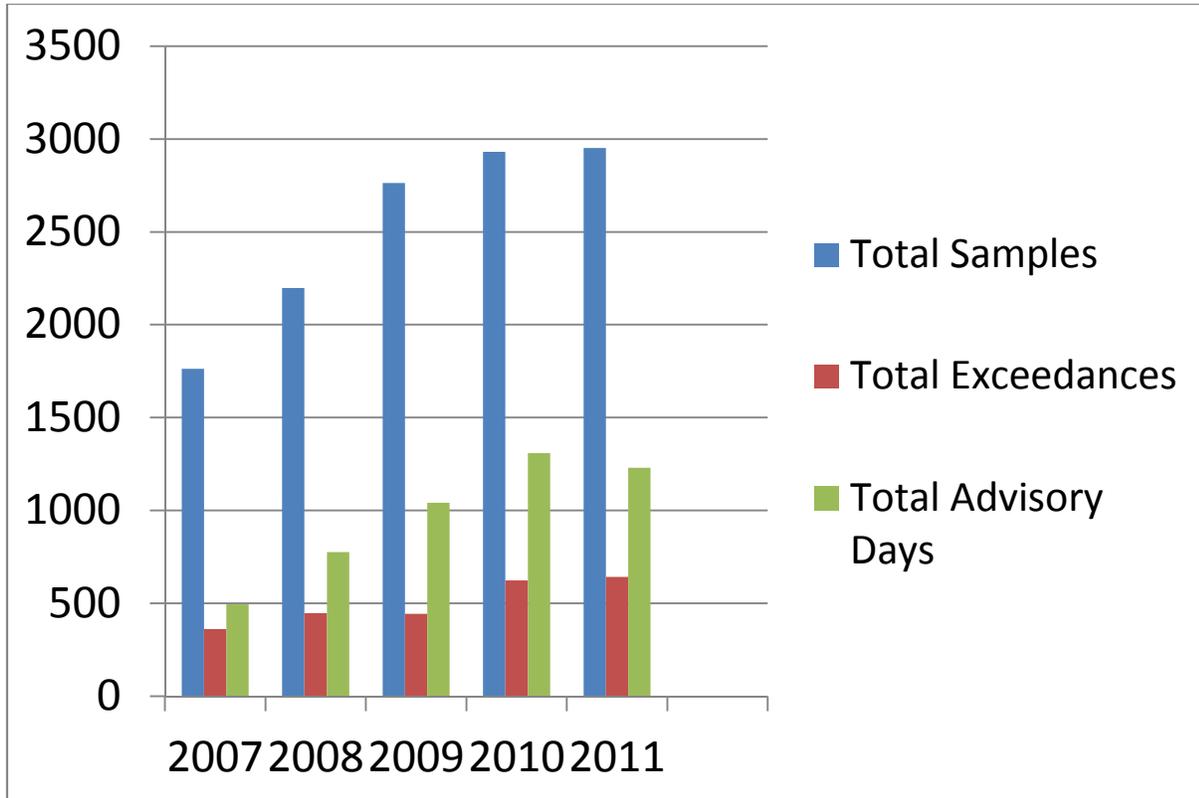
7 samples per week	9 beaches
4 samples per week	34 beaches
1+ sample per week	1 beaches
Minimum of 1 sample per week	17 beaches

<sup>1</sup> Ohio's Lake Erie Public Access Guidebook, 2010, Ohio Department of Natural Resources

The 2011 season again saw an increase in the number of samples taken at the monitored beaches. The total number of samples taken this year was 2,967, up from 2,931 in 2010.

Figure 1 represents the sampling efforts in Ohio's bathing beaches over the past 5 years.

Figure 1



A review of the data from the past five seasons indicates that there while the number of samples collected continues to increase, the number of exceedances remained steady and the number of advisory days decreased in 2011.

During 2011, water quality analysis in Ohio was based upon the single sample maximum established by the United States Environmental Protection Agency (USEPA) of 235 E. coli colony forming units (cfu) per 100mL. of water sampled. Erie, Ottawa and Lake Counties used the Collilert-18 method for sample analysis which has a maximum detection limit, without dilution, of 2419.6 cfu. Cuyahoga County and the Northeast Ohio Regional Sewer District used the Modified M-tech to analyze their samples.

**Public Notification**

When sample results exceeded the standard of 235 cfu, advisory signs were posted to alert the bathing public of the water quality. Under normal circumstances, beaches are not closed solely due to high bacteria levels. However, the signage helps to educate the public and provides valuable data for making informed decisions about their aquatic recreational activity.

The following pictures are examples of the signage posted at a beach location to alert the public whether the sample results from the previous day were acceptable or if the results exceeded the bacterial standard.



Acceptable Results



Exceeded Standard

The ODH posted a request for proposals (RFP) to administer the beach monitoring and notification program at the local level in 2011. In addition to posting the RFP on the internet, the local health jurisdictions that have beaches but have not participated in this program were contacted and encouraged to apply for the contract. A total of six proposals were received. The proposals were reviewed and contracts were awarded. The total amount of money awarded to the local projects was \$150,832.00, which represents 67% of the money awarded to ODH by the US EPA.

Contracts were awarded to the Lake County General Health District, Erie County General Health District, Cuyahoga County Board of Health, Ottawa County Health Department and the University of Toledo. The Lake County General Health District monitored three public beaches in Lake County, one beach in Conneaut City, one beach in Ashtabula City and two beaches in Ashtabula County. The Erie County General Health District monitored 25 public beaches within its jurisdiction. The Northeast Ohio Regional Sewer District monitored three beaches in its area. The Cuyahoga County Board of Health monitored 16 beaches within its jurisdiction most of which are semi-public and private beaches as well as two beaches in Lorain City.

Name of Contracted Entity	Amount of Award	Number of beaches monitored
Lake County General Health District	\$39,885.00	7
Erie County General Health District	\$30,381.00	25
Cuyahoga County Health District	\$41,565.00	21
Ottawa County Health Department	\$23,140.00*	7
University of Toledo	\$15,861.00	2

*\*The Ottawa County Health Department was awarded \$23,140.00; however, due to a delay in processing the contract, the monitoring work began later in the season and the actual amount paid was \$18,690.00.*

**Monitoring Data generated by the Ohio Department of Health and our local partners for the 2011 recreation season.**

The single sample maximum level was used to evaluate sample results. Results were reported for evaluation against the standard, determination of whether an advisory was warranted, and notification to the public when necessary.

Table 2 is a summary of the sampling results and advisories for the monitored beaches in the State of Ohio.

Table 2

ID #	Name	Samples taken	Sample exceedance	% Sample exceedance	Average Ecoli per sample taken	Advisory days	% of the season on advisory
OH810688	Arcadia Beach	18	8	44.4%	325	29	31.9%
OH625113	Battery Park	53	2	4.0%	41.8	5	5.0%
OH983073	Bay Park Beach	15	3	20.0%	107.9	13	13.8%
OH510880	Bay View East	54	6	11.1%	166.4	8	8.5%
OH568760	Bay View West	52	20	38.5%	402.5	37	39.4%
OH351307	Camp Perry	16	6	37.5%	561.6	16	20.8%
OH396459	Catawba Island St. Pk.	12	1	8.0%	238.4	3	3.9%
OH011172	Cedar Point	52	6	11.5%	166.4	18	18.4%
OH597908	Century Beach	96	16	16.6%	33.9	18	18.4%
OH934406	Chappel Creek	53	12	22.6%	36.6	23	23.5%
OH135472	Clarkwood Beach	17	7	41.2%	336.2	32	33.0%
OH484007	Clifton Beach	27	7	25.9%	263.3	24	24.5%
OH862936	Columbia Park Beach	15	2	13.3%	319.2	9	9.1%
OH400405	Conneaut Twp. Park	53	5	9.4%	91.6	13	13.3%
OH014323	Cranberry Creek	50	5	10.0%	86.0	5	5.1%
OH158931	Crystal Rock	52	5	9.6%	109.8	11	11.2%
OH881916	Darby Creek	51	15	29.4%	280.5	31	31.6%
OH685679	East Harbor State Park	42	4	9.5%	117.5	4	5.2%
OH964162	Edgecliff Beach	28	8	28.6%	740.6	45	46.4%
OH270037	Edgewater Beach	112	39	34.8%	286.1	30	27.5%
OH517567	Edson Creek	52	26	50.0%	590.7	43	43.9%
OH244759	Euclid State Park	111	37	33.3%	527.9	47	42.3%
OH491555	Fairport Harbor	98	17	17.3%	158.0	18	18.2%
OH242977	Fichtel Creek	51	8	15.7%	138.4	14	14.3%
OH682568	Geneva State Park	54	7	13.0%	210.7	13	13.3%
OH777353	Headlands State Pk. (East)	98	12	12.2%	134.4	11	11.2%
OH719776	Headlands State Pk. (West)	99	15	15.2%	140.6	15	15.3%
OH497945	Hoffman Ditch	52	2	3.8%	84.5	5	5.1%
OH183537	Huntington Beach	106	13	12.3%	211.1	13	12.3%
OH531706	Huron River East	57	7	12.3%	206.5	13	13.3%
OH102681	Huron River West	51	13	25.5%	249.1	41	41.8%
OH133557	Kelleys Island St. Pk.	11	0	0.00%	22.5	0	0.00%

<b>ID #</b>	<b>Name</b>	<b>Samples taken</b>	<b>Sample exceedance</b>	<b>% Sample exceedance</b>	<b>Average Ecoli per sample taken</b>	<b>Advisory days</b>	<b>% of the season on advisory</b>
<b>OH661129</b>	Kiwanis Park	53	4	7.5%	111.4	7	7.1%
<b>OH882395</b>	Lakeshore Park	55	18	32.7%	341.0	38	38.8%
<b>OH216093</b>	Lakeside	41	2	4.9%	35.8	5	6.5%
<b>OH273826</b>	Lakeview Beach	95	48	50.5%	654.6	50	51.0%
<b>OH921073</b>	Lion's Park	52	6	11.5%	119.3	19	19.4%
<b>OH182884</b>	Maumee Bay St. Pk. (Erie)	45	7	15.6%	107.7	16	19.0%
<b>OH318877</b>	Maumee Bay St. Pk. (Inland)	44	1	2.3%	35.0	5	6.5%
<b>OH507120</b>	Moss Point Beach	19	9	47.4%	424.9	34	35.1%
<b>OH159626</b>	Noble Beach	19	8	42.1%	400.4	31	32.0%
<b>OH647956</b>	Old Woman Creek East	49	4	8.2%	85.6	7	7.1%
<b>OH787470</b>	Old Woman Creek West	53	2	3.8%	42.7	2	2.0%
<b>OH645425</b>	Parklawn Beach	18	5	27.8%	418.7	19	19.4%
<b>OH957157</b>	Pickeral Creek	53	5	9.4%	107.6	18	18.4%
<b>OH463595</b>	Port Clinton (Lakeview)	41	14	34.1%	517.6	36	46.8%
<b>OH934275</b>	Royal Acres Beach	16	6	37.5%	303.3	29	29.9%
<b>OH453378</b>	Sawmill Creek	49	5	10.2%	173.5	5	5.1%
<b>OH840983</b>	Sherod Creek	53	20	37.7%	279.5	36	36.7%
<b>OH179611</b>	Shoreby Club Beach	17	6	35.3%	215	26	26.8%
<b>OH287343</b>	Showse Park	52	8	15.4%	100.5	22	22.4%
<b>OH435857</b>	Sims Beach	19	9	47.4%	399.5	34	35.1%
<b>OH907394</b>	South Bass Island St. Pk.	11	0	0.0%	10.2	0	0.0%
<b>OH513071</b>	Sugar Creek	53	15	28.3%	248.1	28	28.6%
<b>OH775880</b>	Utopia Beach	18	5	27.8%	188.3	17	17.5%
<b>OH084281</b>	Vermilion East	53	11	20.8%	160.7	20	20.4%
<b>OH944567</b>	Vermilion West	55	13	23.6%	213.7	26	26.5%
<b>OH736320</b>	Villa Angela State Park	111	56	50.5%	553.4	57	50.5%
<b>OH136995</b>	Wagar Beach	17	3	17.6%	206.2	9	9.2%
<b>OH610732</b>	Walnut Beach	55	4	7.3%	60.4	10	10.2%
<b>OH422598</b>	Whites Landing	54	12	22.2%	204.9	17	17.3%

Additional money was awarded for a comprehensive beach monitoring and notification system that was installed at ODH in May 2011. That contract was awarded to Windsor Solutions, Inc. in the amount of \$61,728.00.

## **NOWCASTING and predictive models**

During the summer of 2011, the Cuyahoga County Board of Health, in collaboration with the United States Geological Survey (USGS), continued the predictive modeling project at Huntington Beach, located on Lake Erie in Bay Village, Ohio. The project, known as Nowcasting System for Predicting Beach Advisories, evaluates multiple environmental factors such as rainfall, turbidity, wave height, and various other factors to determine the probability that the E. coli water quality standard will be exceeded. The Nowcast system provides the public with same-day, near real-time water quality data seven days per week.

The Northeast Ohio Regional Sewer District (NEORS) continued the Nowcast predictive model developed in cooperation with the USGS for the beach at Edgewater State Park. The NEORS sampling crews were equipped with laptop computers and a wireless card, to effectively and efficiently identify water quality issues using the model. The sampling crews entered several variables into the model and posted the appropriate beach signage based on the prediction from the model.

As in previous years, it was agreed that water samples would be collected and analyzed for E. coli in the normal fashion in addition to the sample protocol for the Nowcast system. It was also agreed that the Nowcast predictions would be used as the determinant factor for posting water quality advisories at Huntington Beach and Edgewater. A detailed explanation of the project as well as results of sampling and predictions was available to the public throughout the summer at the following website, [www.ohionowcast.info](http://www.ohionowcast.info).

The University of Toledo also partnered with the USGS to develop a Nowcast model for use at Maumee Bay on the western shore of Lake Erie. The model went 'live' in 2011 but did not perform as well as the models for Huntington and Edgewater beaches. Further review of the variables is ongoing and it is expected that the model for 2012 will be changed to improve accuracy.

### **Additional activities and accomplishments in 2011**

In 2011 a massive harmful algal bloom covered the western basin and moved into the central basin of Lake Erie. The bloom became most pronounced at the end of the season with concerns raised by the tourism and fishing industries on Lake Erie. The Ohio Department of Health and the Ohio Environmental Protection Agency provided technical assistance to the Erie County General Health District on these harmful algal blooms. It was reported that the bloom extended 12 miles from the shore and was at a depth on greater than 60 feet. Beach advisories were posted as a result of the bloom. Reports of illnesses from contact with the harmful algal bloom were low.