Wisconsin's Great Lakes Beach Monitoring & Notification Program

2015 Beach Season Summary

Waiting for the Right Wave
Harrington Beach State Park– Lake Michigan
Photo Credit: Wendi Huffman

Summer Day on Lake Superior
Big Bay City Park - Lake Superior
Photo Credit: Michael Knapstein

Office of the Great Lakes
Wisconsin Department of Natural Resources
November 1, 2016

Acknowledgements

Wisconsin's Great Lakes Beach Monitoring & Notification Program could not operate without its partnerships with local health departments and significant support from Dr. Julie Kinzelman and her staff at the City of Racine Health Department and Kim Busse, Dr. Greg Kleinheinz, staff and students at the University of Wisconsin Environmental Research and Innovation Center in Oshkosh. Their continuing commitment to improving beach water quality by developing fundable restoration plans has resulted in successful grant applications bringing significant resources to our coastal communities.

Alice McCarthy (USGS) continues to provide tremendous support and service to our program and last year was no exception. Alice trained new Beach Health website users, improved the user interface and reporting systems, responded quickly to public inquiries, and managed the application and database that is the core of our public notification system. Her initiative to automate and streamline the data review at the end of the 2015 season reduced the time and effort necessary to identify errors and adds confidence to the data submitted to EPA's BEACON system.

We also recognize Lindsey Page (City of Milwaukee Health Department), Dr. Adam Mednick (UW – Sea Grant) and Danielle Cloutier (UW Milwaukee School of Freshwater Science) for the time and effort to make the fall Wisconsin Coastal Beaches Stakeholders Group meeting a success. Together with the steering team - Emmy Wollenburg (Dept. of Health), Dr. Julie Kinzelman, Kim Busse, Todd Breiby (DOA Coastal Program) and Donalea Dinsmore - they designed an effective process for our beach community stakeholders to provide feedback on priority issues which will inform Beach Program efforts moving forward.

Special thanks go to Gene Clark from Wisconsin Sea Grant and Todd Breiby from the Wisconsin Coastal Management Program for their work on the "Be Current Smart" water safety campaign, which forwards rip-current awareness and last year provided safety equipment for beaches along our coastline to protect beachgoers.

Thanks to everyone who helps make Wisconsin's Great Lakes Beach Program a success!

County participants include:

Ashland County Health Department
Bayfield County Health Department
City of Milwaukee Health Department
Door County Health Department
Douglas County Health Department
Iron County Health Department
Kenosha County Division of Health
Kewaunee County Health Department
Manitowoc County Health Department
North Shore/Shorewood Health Department
Ozaukee County Health Department
City of Racine Public Health Department
Sheboygan County Human Services
South Milwaukee Health Department

Additional assistance provided by:

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Sampling and Analytical Support for Door, Kewaunee, Manitowoc, and Iron Counties

Racine Public Health Department

Sampling and Analytical Support for Kenosha and Racine Counties and South Milwaukee Health Departments

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Bay-Lake Regional Planning Commission (Angela Kowalzek-Adrians)

Summary

Summer 2015 was the thirteenth season of the Wisconsin's Great Lakes Beach Monitoring & Notification Program. The beach program operated similarly to 2014, with an increased number of beaches covered and added emphasis on Nowcasting with adjustments to decision criteria based on its operation. *It should be noted that the overall sampling plan is biased toward locations with higher numbers of exceedances because risk to swimmers weighed heavily in the BEACH Act funding decision-making.*

In fiscal year 2014, the United States Environmental Protection Agency (USEPA) awarded the Wisconsin Department of Natural Resources (WDNR) a grant for $217,000 to implement the federal Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000. This grant funded the 2015 beach season.

The program stretches its resources to monitor as many of the 186 coastal beaches as possible. Of these 186 beaches, 101 (54%) were monitored in 2015, an increase from the 94 monitored 2014. Local jurisdictions implemented Nowcasting at 16 beaches, with some health departments using it as the primary tool for posting public notifications and others using it in conjunction with other decision tools. A total of 3837 samples were reported (compared to 3049 in 2014 and 3145 in 2013). The total number of samples includes BEACH Act funded monitoring, locally intensified monitoring, and voluntary monitoring efforts reported to the Wisconsin Beach Health website.

This year's annual report presents data summaries by county for each beach monitored and incorporates a new column that is identified as "Beach Action Days". This new column reflects the number of days that either an advisory or closure was in effect at the beach. This provides a more accurate picture of how often people experienced water quality advice over the entire season. Historically, the exceedance frequency data in the annual report only considered the samples collected and did not consider preemptive advisories (generally rainfall driven events) or Nowcast predictions. A number of locations do not have access to laboratory services or other staff over the weekend so by Wisconsin beach program policy, the advisory would remain in effect until sample results or Nowcast show that conditions have improved. In addition, beaches that used a two-tiered Nowcast system increased the number of days that public notifications of water quality were posted (water quality notifications on days when no samples were collected). The exceedance frequency continues to be calculated based on sample results as it has in the past.

General Program Overview

A "beach" for the purpose of the Wisconsin Great Lakes Beach Monitoring & Notification Program implementation is defined as:

"*A publicly owned shoreline or land area, not contained in a man-made structure, located on the shore of Lake Michigan or Lake Superior, that is used for swimming, recreational bathing or other water contact recreational activity".*

After considering this definition, several boat launches and natural areas that were included on the 2014 Wisconsin beach list were removed. As part of this assessment, the beach listing now includes a column for type of use. Inland and federal beaches are ineligible to receive funding and are not included in the reporting; however, several communities and state parks participate in these efforts voluntarily, posting information on the Beach Health website. These beaches are not included on the beach list posted on DNR's website, which is limited to coastal beaches. One beach at the Apostle Islands National Lakeshore appears on the posted list because it's a popular destination. As a federal beach, this location is ineligible for BEACH Act funding; however

Wisconsin's Beach Health website has been made available to the park for communicating advisory information.

Coastal processes change beach dimensions over time, individual beaches may be improved or restored, and beach usage patterns can also change, so local beach managers are given an opportunity to re-evaluate their priority classification and update their information annually. Beach priority (now termed "tier"), the existence of an operational Nowcast, and impairment status are major considerations in determining the frequency for monitoring and thus in determining funding allocations.

The assistance agreements and contracts recognize implementation of Nowcast modeling as a program activity and, for jurisdictions with capability to do rapid testing using qualitative polymerase chain reaction (qPCR) techniques, provide an opportunity to demonstrate their performance at specific beaches and implement more real-time monitoring. In addition, these agreements include a requirement to collect and report a list of sanitary survey parameters at each monitored beach. Standard field collection procedures, analytical protocols, reporting, and public notification practices (including using consistent advisory signs for beach posting) have been formalized in a quality assurance project plan as well as contracts and assistance agreements issued for performing BEACH Act compliance work.

BEACH Act funding supports the Wisconsin Beach Health Website (http://www.wibeaches.us), that is maintained by staff at USGS in partnership with the local health department staff and cooperators who use the site to report beach status and bacteria data. Beach managers also use this site for reporting sanitary survey data associated with their beaches and operate Nowcast models. USGS serves as the primary data manager and oversees all data integration needs with USEPA to support the national information exchange goals of the BEACH Act.

2015 Beach Season: Program Highlights

In 2015, Wisconsin did a more extensive evaluation of its beach list to align the listings with revised grant guidance. As a result of this outreach effort to the counties and comments from the public, 14 beach names were updated and 10 beaches were added. Several listings were consolidated into a single beach and 10 beaches were removed. In preparing the annual beach list, placing beaches in tiers, and establishing the minimum monitoring frequencies, WI DNR considered:

- Whether use of the area meets the definition of a beach with water contact recreation
- Current and historical water quality trends.
- Beachgoer usage and how local residents refer to the beach (local name).
- How the beach area is managed, access points, and the accuracy of its locational measurements.
- Changes to the surrounding land and shoreline conditions.
- Whether monitoring frequency is appropriate for the use, conditions, and notification tools in place.
- If "Nowcasts" or other tools are being explored to improve the timing of beach notifications.
- Whether there are new parks with beach areas or access points where people are recreating in the water.

The 2015 list identified 186 coastal beaches along Lake Michigan and Lake Superior. In the original assessment in 2004, coastal beaches were geo-located using global positioning system (GPS) equipment and software. As part of the review, locations and measurements were verified using DNR's Surface Water Data Viewer (SWDV), a geographic information system (GIS)

interface with comparable accuracy to current recreational GPS units. The SWDV was also used to locate new beaches or adjust locations when a significant discrepancy was identified. Once locations were established, ArcGIS was used to create beach maps for each county. These maps can be accessed using the Search button on the Beaches topic page on the DNR website. http://dnr.wi.gov/topic/beaches/. The beach list is attached to the end of this report and it is also posted on the DNR website.

Monitoring occurred at 101 of the 186 Wisconsin beaches, including all 25 beaches identified as Tier 1. Seven beaches were monitored voluntarily or entirely with alternate funding. Local jurisdictions implemented Nowcast models at 16 beaches, with some health departments using it as the primary tool for posting public notifications and others using it in conjunction with other decision tools. Wisconsin's Great Lakes Beach Monitoring & Notification Program relies on the local public health organizations along the coastline for primary outreach and communication. They are the primary point of contact for answering questions and responding to requests for information about beach water quality; however, they are not alone in their efforts to manage beach issues.

Wisconsin Beach Workgroup

The Wisconsin Coastal Beaches Workgroup (WCBW) was re-established to provide beach managers with an information-sharing platform and opportunities for coordination, stakeholder input, and funding connections. WCBW members include representation from the WDNR, USGS, WI Sea Grant, health departments, municipalities, and academic research institutions. The WCBW steering committee and "Topic Teams" work to achieve tangible, high-priority objectives as identified by workgroup members and stakeholders. The 2015 Annual Meeting was attended by 39 members and took place at the UW-Milwaukee School of Freshwater Science. Attendees participated in round-table discussions to identify critical needs and objectives related to Implementing Nowcast Models, Improving Advisory Communications, and Integrating Source Tracking into Beach Management.

Round-table discussions highlighted the follow priority issues:

1) Implementing Water-Quality Nowcasting
    a. Develop more Nowcast Models for Local Users
    b. Develop/ Provide Nowcast Guidelines & Procedures
2) Improving Advisory Communications
    a. Develop New Signs & Tools to Communicate Water Quality/Safety Conditions
3) Integrating Source ID into Beach Management
    a. Catalog Source-ID Efforts to Better Target Resources

Nowcasting

This beach season marked the third consecutive year operational Nowcast models informed decisions on whether to issue (or lift) swim advisories and beach closures, as well as whether or not to sample and test on a given day. Ten of 16 beaches employed "two-tiered" Nowcast systems, using EPA's Virtual Beach modeling software and USGS' Environmental Data Discovery and Transformation (EnDDaT) online data portal. Tier I models are operated on sampling days, using a combination of routine sanitary measurements and online data accessed via EnDDaT. Tier II models operated on non-sampled days, using only EnDDaT data. An additional beach used a Tier II model for sampled as well as non-sampled days. For beaches where sampling frequency could be reduced because of the added public-health coverage of a Tier II model, Nowcasting proved not only more timely, but more *cost-effective* than traditional monitoring.

Beaches with operational Nowcast models were encouraged to use the model as the primary means for issuing water quality advice rather than switching between the model and the traditional monitoring data. Those locations with Tier 2 Nowcasts expanded the number of days that water quality status was posted at their beaches with no increase in number of samples collected. Even though the nowcasts are shown to be more accurate than traditional E coli monitoring overall, public health decision-makers tend to be less confident in them in part because they get timely feedback about conflicting results between the two techniques so they are more aware when there may be errors in deciding to post an advisory (e.g. when model results indicate no advisory and sample results are above advisory levels). It takes time to develop experience with the model and to understand when recalibration may be necessary. This is an on-going issue that requires technical support.

Because funding for WDNR's Nowcast project ended in early 2014, WDNR did not actively work to expand Nowcast implementation in the lead-up to the 2015 beach season so no new Nowcasts were implemented. WDNR partnered with the Wisconsin Coastal Management Program and the Department of Health to provide University of Wisconsin Sea Grant Institute funding with the goal of building Nowcast modeling to a sustainable level, Activities within the project included development of online training with supporting materials, and formation of a Virtual Beach Users Group (www.seagrant.wisc.edu/virtualbeach). This effort is a direct response to the findings of WDNR's Nowcast project and its resulting recommendations:

> *In order to ensure continued expansion and long-term sustainability of [N]owcast modeling, we recommend strategic investments in three areas: (1) improving the operational capacity of the EnDDaT system, (2) maintaining basic support for periodic updates and bug fixes to Virtual Beach, and (3) supporting Nowcast training, technical support, and guidance* (Mednick and Watermolen 2014: executive summary).

Dr. Adam Mednick led the project effort at Sea Grant. Virtual Beach users reported problems with the reliability of the EnDDAT system which prevented use of the models during portions of the season. Adam worked with USGS and Great Lakes Observing System (GLOS) to identify both short and long-term solutions. Sea Grant continues to work with the USGS Center for Integrated Data Analytics, Great Lakes Commission, and Great Lakes Observing System to identify and implement enhancements that improve the speed and reliability of EnDDaT and its related web data services. Additionally, significant effort was invested in the second recommendation – maintaining basic support for Virtual Beach. This issue delayed release of a new version of Virtual Beach that fixed several identified bugs. EPA had no plans to actively maintain Virtual Beach. This presented a significant risk, as intermittent changes to related but external systems have been shown to effect the operation of Virtual Beach. Discussions with EPA continued into 2016 to resolve the maintenance issue.

Water Quality Signage Update

New water quality signage has been developed, following recommendation from public feedback, and appeared at monitored beaches starting in the 2016 swimming season. New signs include a QR code that can link users to the beach health website and contain multi-lingual messaging to explain the three levels of advice on water quality conditions. The QR code can be accessed from a smartphone or tablet. This new signage supplements the existing color-coded signs or flags used at monitored beaches.

Implementation of Source Tracking and qPCR Methods

At the workgroup annual meeting, a number of participants identified the need for more information and guidance surrounding source tracking and how to incorporate newer methods such as qualitative polymerase chain reaction or qPCR into the BEACH program. Although some participants had been introduced to qPCR as a method tool for same day analysis to determine whether advisory conditions exist, they were less familiar with its use as a tool to associate *E. coli* DNA with the host species contributing to the water quality exceedance. Many want to better understand when to use sanitary surveys and when to use qPCR for source identification. Although a few laboratories in Wisconsin are capable of performing qPCR, capacity is limited and a standard threshold associated with *E. coli* results does not yet exist. (EPA's recreational criteria established a Beach Action Values (BAV) for enterococci by qPCR only.) To date, only the City of Racine has established BAVs using qPCR for *E. coli.* Dr. Sandra McLellan's laboratory has the most extensive experience in performing qPCR and interpreting results for source identification (i.e. human, gull, ruminant, etc.)

Considering the costs associated with using these methods and the current BEACH grant guidance directing recipients to establish priorities for implementing rapid techniques, Wisconsin's BEACH program allocated special funding to develop guidance documents and support materials associated with implementing qPCR into the monitoring program. Dr. Kinzelman explored whether her laboratory could develop capacity for identifying human sourced *E. coli* using two molecular markers similar to those used in Dr. McLellan's laboratory. WDNR began a project to develop program implementation documents and in 2016, hired an experienced intern to begin their preparation (funded in part with 2015 grant funds).

Time Schedule

The activities described in this report took place during Federal Fiscal Year (FFY) 2015 (October 1, 2014 through June 30, 2016). The beach season is defined for Wisconsin coastal beaches as Memorial Day Weekend through Labor Day Weekend (108 days). In Lake Superior, water recreational activities are heavily influenced by spring weather, with storms, water temperatures and the number of warm days affecting beach visitation.

Budget – BEACH Act Grant only

The strategy for allocating funding placed a priority on support for Wisconsin's Beach Health web application operated by USGS because it both manages the data and provides public notification of beach conditions. Funding for monitoring considered the beach priority (Tier), ability to leverage other funding, or partnership arrangements, locations with operational Nowcasts, travel considerations for sampling and status on the 303(d) impaired waters list.

Budget constraints drove our decision to maintain the minimum required sampling frequency at most Tier 1 beaches to twice per week, recognizing that Nowcasts at 16 beaches supported public notifications. Local partners have the latitude to voluntarily increase monitoring at any beaches based on local needs and funding. A few locations with higher risk of contamination and without Nowcast capabilities were funded for sampling 3 times per week. Tier 2 beaches were funded for sampling once per week except for those with Nowcasts, which received funding for sampling twice per week. Tier 3 beaches that also appear on the 303(d) Impaired Waters list were prioritized for sampling once per week. Federal restrictions on how grant funds can be used affected local partners' capacity to collect samples for the explicit purpose of identification and control of pollution sources leading to elevated bacteria levels. Any efforts to do so were done independent of the BEACH Act funding.

The highest priority for funding was given to maintaining the USGS website, a central tool for notifying the public about beach conditions and to manage data reported to USEPA as required by the grant. Annual costs for operational and maintenance of these functions is $35,000.

As was the case in 2014, low priority beaches were ineligible for grant funding unless the beach was identified as an impaired water for bacteria on the 303(d) list. Monitoring for beaches on islands could only be funded by the grant if transportation costs were covered by another means. At the recommendation of our Nowcast developers at WDNR and USGS, locations with operational models retained a base level monitoring program with sampling twice per week. For budgeting purposes, allocations were broken out by county or local entity. Contracts for implementing the program bundled monitoring dollars somewhat regionally to optimize available resources and leverage multiple funding sources.

Table 1. Allocation of Beach Act Funds for the 2015 Season

Participating Locations/Counties	2015 Allocation
Ashland County*	$6,000
Bayfield County	$6,000
Brown County	$0
Door	$60,000
Douglas*	$6000
Iron++	$1,000
Kenosha+	$9,000
Kewaunee County++	$4,000
Manitowoc County++	$12,000
Milwaukee, City of	$12,000
Northshore/Shorewood Health Dept	$4,000
Ozaukee County	$17,000
Racine, City of	$24,000
Sheboygan County	$12,500
South Milwaukee, City of+	$6,000
Total	**$164,500**

* Funded through agreement with Northland College
+Funded through City of Racine allocation
++Funded through agreement with UW-Oshkosh with an additional $5000 allocated for enhanced sanitary survey at restored beaches primarily in Manitowoc County and for operational Nowcasting

The City of Racine received an additional $8000 special project allocation for the following activities:

- Repeat annual sanitary surveys for four sites that have begun restoration (Samuel Myers Park, Simmons Island, Eichelman, and Grant Park).
- Determine whether any initial water quality improvement could be observed as a result of initial restorations.
- Develop site-specific metrics for gauging restoration success at designated beaches
- Identify pollution sources that remain unaddressed in the restoration plans.
- Pilot *Bacteriodes* marker testing for determining potential human inputs for the Root River and Oak Creek.

Remaining grant funds were used for printing a new multi-lingual sign, participation in the Great Lakes Beach Association conference, and to begin developing reports and guidance on implementing source tracking in beach operations (blending sanitary survey and DNA techniques for identifying host species).

Monitoring Summary Results

This year's summary tables include a column that identifies the actual number of days a beach had an advisory or closure (beach action) in place. This provides better representation of conditions at the beach. Evaluation of this data indicates conditions can change fairly rapidly, with most advisories lasting less than two days.

Summary data in this section provides information for each monitored beach organized by county and grouped by lake The tables provide summary information with encoded status information:

N - Nowcast,
V - Voluntary,
A - Alternate funding

followed by the contracted frequency, total number of samples collected, the number and percentage of samples that exceed the *E. coli* advisory threshold of 235 Colonies/100 mL and the number and percentage of samples that exceed the closure threshold of 1000 Colonies/100 mL. Summary statistics for the *E. coli* monitoring results were derived from the Wisconsin's Beach Health database. The highlighted line for each county provides summary information for the county, with the first entry identifying the number of monitored beaches rather than the contracted frequency.

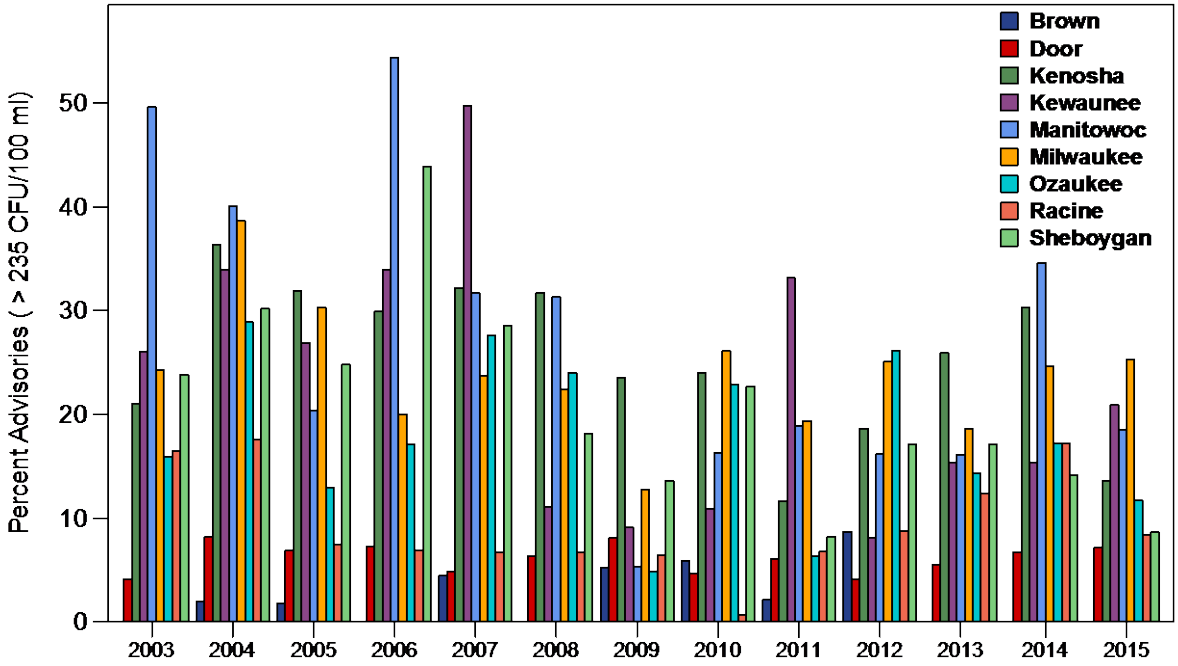
As a function of Wisconsin's prioritizing monitoring at impaired waters and more intensive monitoring at beaches with higher numbers of exceedances, our monitoring program is inherently biased toward locations with higher risk of exceeding the water quality standard. The summary statistics should not be considered as representative of overall water quality at Wisconsin's Great Lakes beaches. Water quality on any given day can be significantly different than the results of the summary statistics, which were performed over the entire swimming season. Water levels in the Great Lakes rebounded from near record lows to more normal levels in 2015, causing erosion and reductions in exposed lakebed at many Lake Michigan and Lake Superior beaches. Due to these changing lake dynamics, beach listings have been altered to better represent the conditions experienced at these beaches and also the corresponding beach usage.

A total of 3,837 samples were collected (compared to 3,049 in 2014 and 3,145 in 2013) that were reported on the Beach Health Website (http://www.wibeaches.us). At 4 locations, results reported were composite of multiple locations so the total sample numbers have been adjusted to avoid duplicated results. Of the samples collected 12.6% exceeded the water quality advisory threshold of 235 CFU/100mL (Table 2). Of those exceedances, 3.9% of all samples collected exceeded the 1,000 CFU/100mL criteria for beach closure.

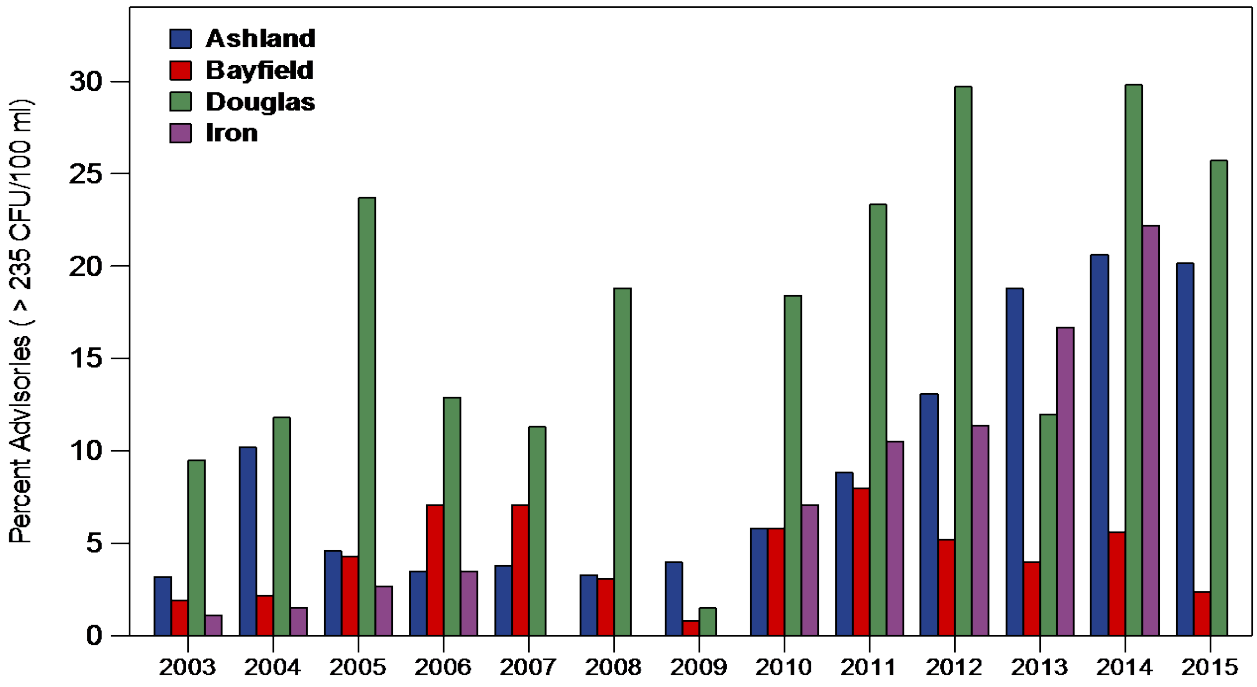
Table 3. Annual Sample Percentages that exceed the advisory level of 235 CFU/100mL

COUNTY	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Ashland	3.2	10.2	4.6	3.5	3.8	3.3	4	5.8	8.9	13.1	18.8	20.6	20.1
Bayfield	1.9	2.2	4.3	7.1	7.1	3.1	0.8	5.8	8	5.2	4	5.6	2.4
Brown	0	2	1.8	0	4.5	0	5.2	5.9	2.1	8.7	0	NA	NA
Door	4.1	8.2	6.9	7.3	4.8	6.3	8.1	4.7	6.0	4.1	5.5	6.7	7.2
Douglas	9.5	11.8	23.7	12.9	11.3	18.8	1.5	18.4	23.3	29.7	12	29.8	25.7
Iron	1.1	1.5	2.7	3.5	0	0	0	7.1	10.5	11.4	16.7	22.2	0.0
Kenosha	21	36.3	31.9	29.9	32.2	31.7	23.5	24	11.7	18.6	25.9	30.3	13.6
Kewaunee	26	33.9	26.9	33.9	49.7	11.1	9.1	10.9	33.5	8.1	15.3	15.3	20.9
Manitowoc	49.6	40.1	20.4	54.4	31.7	31.3	5.3	16.3	18.9	16.	16.1	34.6	18.5
Milwaukee	24.3	38.7	30.3	20	23.7	22.4	12.7	26.1	19.4	25.1	18.6	24.6	25.3
Ozaukee	15.9	28.9	12.9	17.1	27.6	24	4.8	22.9	6.4	26.1	14.3	17.2	11.7
Racine	16.5	17.6	7.4	6.9	6.7	6.7	6.4	0.7	6.8	8.8	12.4	17.2	8.3
Sheboygan	23.8	30.2	24.8	43.9	28.5	18.1	13.6	22.7	8.2	17.1	17.1	14.1	8.6
Grand Total	14.6	22.2	15.7	17.5	17.1	14.4	7.3	12.4	11.8	14.4	11	18.1	12.6

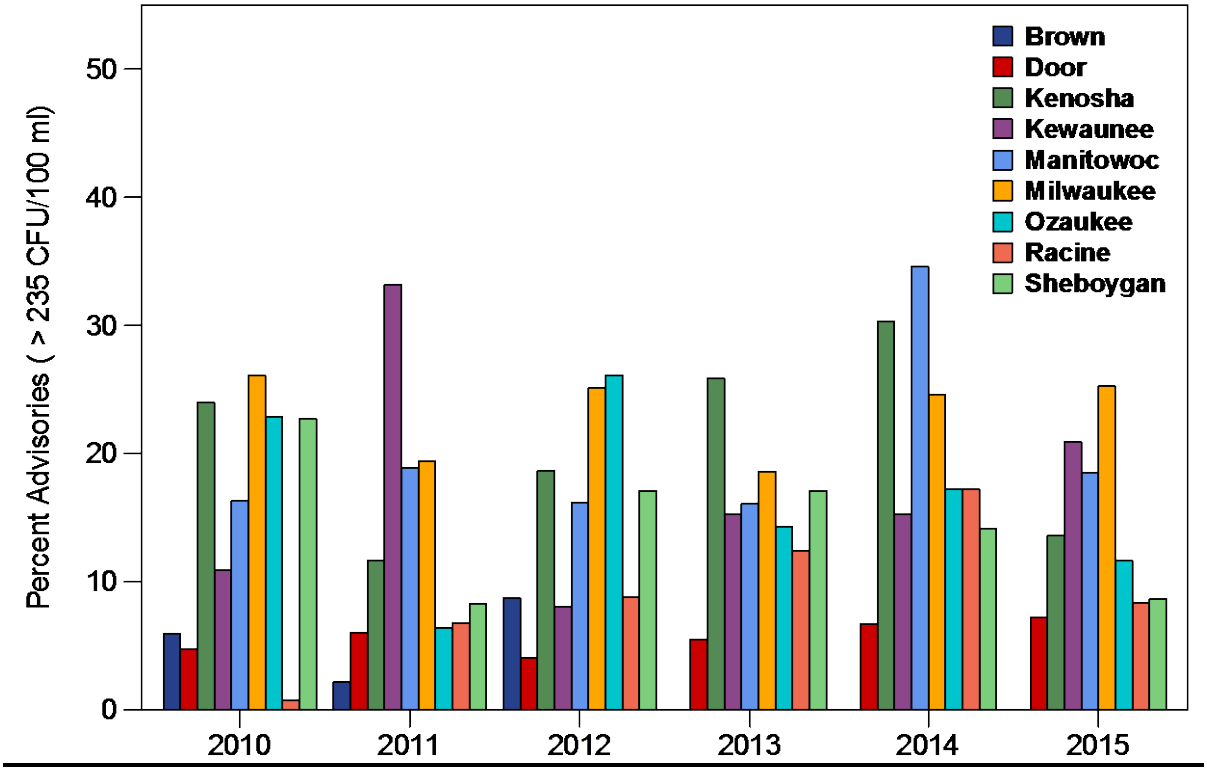
Lake Michigan Counties
2003–2015



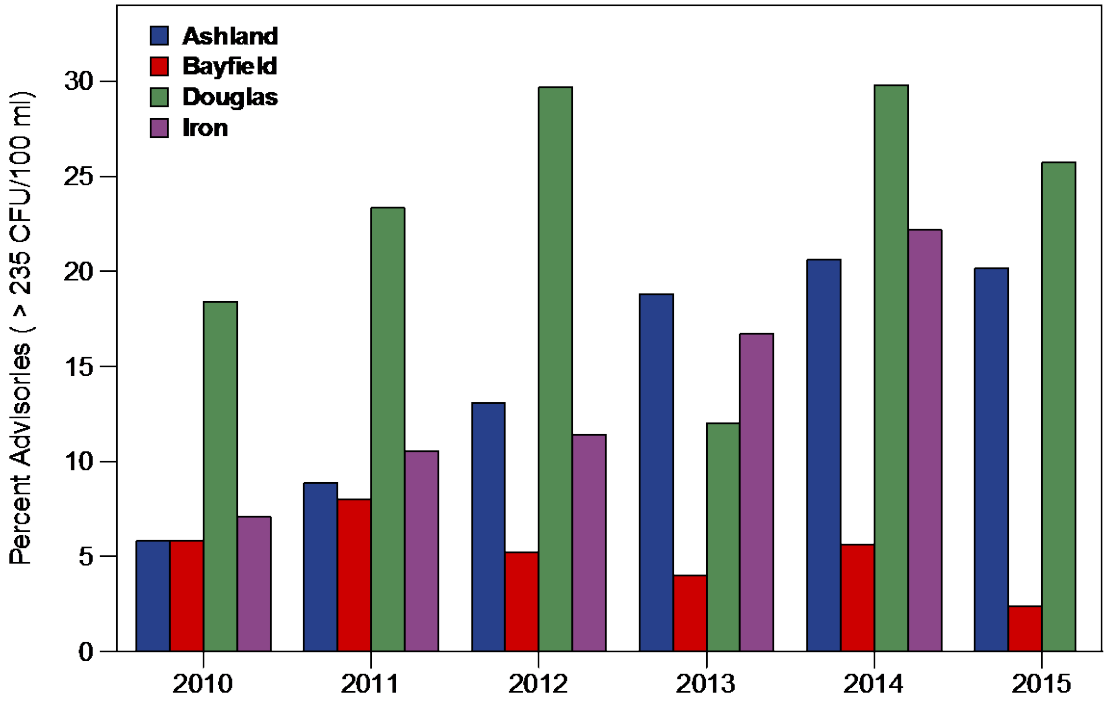
Lake Superior Counties
2003–2015



Lake Michigan Counties
2010–2015



Lake Superior Counties
2010–2015



Lake Michigan

Eight counties are currently involved with BEACH Act monitoring and notification: Door, Kewaunee, Manitowoc, Sheboygan, Ozaukee, Milwaukee, Kenosha, and Racine. Brown County has been included in the report because of efforts to restore Bay Beach.

Brown County

Brown County beaches were all identified as low priority and did not receive BEACH Act funding.

Bay Beach shoreline, August 2016
DNR photo

Green Bay leaders are pursuing restoration of the shoreline at Bay Beach Amusement Park as a beach. This beach area was closed in the 1940s because of poor water quality. E. coli monitoring over the last three years indicates that bacteria levels are similar to those experienced in Door County, with exceedances associated with stormwater. Green Bay experiences algae blooms periodically through the summer with preliminary indications that at times, levels may be in the moderate risk category compared to World Health Organization algal criteria so additional assessment is planned. Currently, access to the water is poor, however people have been observed climbing down the rocks to access the beach. The community is developing a feasibility study. Given these discussions, Bay Beach remains on the beach list but is not included in the map of current locations. The map with other beach locations for Brown County can be found here.

Door County

Door County has the highest number of coastal beaches in the State, making it one of the most popular summer tourist destinations in Wisconsin. Door County places an emphasis on regular monitoring, testing 32 public beaches on the peninsula as well as Washington and Rock Islands throughout the summer. The county collected 1,116 samples in 2015 compared to 1,091 (and 1,056 in 2014 and 2013 respectively). As with past years, the county used a combination of BEACH Act support and local funding to implement their program. This is particularly notable given the transportation costs associated with monitoring the island beaches. The county's partnership with the University of Wisconsin – Oshkosh enables their program to function cost-effectively.

Murphy Park Beach

Pre-construction (2008)
Photo to the left

Post-construction (2015)
Photo to the right

Photos courtesy of Door County Soil and Water Conservation District

The county continues to implement redesigns and best management practices (BMPs) at their beaches through a cost share program. The Door County Soil and Water Department received a Great Lakes Restoration Initiative grant in 2011 that extended into 2015. Anclam Park Beach (Town of Baileys Harbor), Otumba Park (City of Sturgeon Bay) and Baileys Harbor Ridges Beach (Door County Parks Department) implemented BMPs during the initial phase of the grant. Two high priority locations, Lakeside Park Beach (Jacksonport) and Murphy Park Beach (Door County Parks) took advantage of the cost share. Similar agreements resulted in BMP implementation at Haines Park, Portage Park, and Europe Bay/Hotz Memorial Park. Door County continues to improve its beaches both for water quality and aesthetics.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Actions Days
1	Anclam Park	28	2	7	1	4	2
2	Baileys Harbor Ridges Park	56	2	4	0	0	2
1	Clay Banks #2	29	2	7	1	3	2
2	Egg Harbor	58	7	12	4	7	7
2	Ellison Bay Town Park	56	0	0	0	0	0
2	Ephraim Village	56	7	13	1	2	7
1	Europe Bay #1	29	1	3	1	3	1
1	Europe Bay #2	29	2	7	0	0	1
1	Europe Bay #3	29	2	7	0	0	1
2	Fish Creek	58	16	28	6	10	17
2	Frank E. Murphy Park	57	3	5	1	2	0
1	Gislason Beach	14	0	0	0	0	0
1	Haines Park	28	1	4	1	4	1
1	Jackson Harbor Ridges	14	0	0	0	0	0
1	Lakeside Park	29	1	3	1	3	1
1	Lily Bay Boat Launch	15	0	0	0	0	0
2	Newport Bay at Penninsula State	56	0	0	0	0	0
2	Nicolet Beach at Penninsula State	57	9	16	2	4	9
2	Otumba Park	56	4	7	2	4	16
1	Percy Johnson Memorial Park	18	4	22	0	0	5
1	Portage Park	28	0	0	0	0	0
1	Rock Island State Park	14	0	0	0	0	0
1	Sand Bay #1	32	4	13	1	3	4
1	Sand Dunes	14	0	0	0	0	0
1	Sandy Bay Town Park	28	1	4	0	0	2
1	School House	15	1	7	1	7	1
2	Sister Bay Park	56	3	5	1	2	4
1	Sturgeon Bay Ship Canal	28	0	0	0	0	0
1	Sunset Park Beach Sturgeon Bay	56	4	7	1	2	4
1	Whitefish Bay Boat Launch	14	0	0	0	0	0
1	Whitefish Dunes State Park	59	4	7	1	2	4
31	**Door Co. Total**	**1116**	**80**	**7**	**26**	**2**	**91**

A map with beach locations for Door County can be found here. Note: Robert E. LaSalle Park was added after the 2015 beach season.

Kenosha County

BEACH Act monitoring for Kenosha County beaches was done through an assistance agreement with the City of Racine. This arrangement enabled the program to leverage other grants and funding sources as well as providing sufficient funding to support summer staff necessary to do the sample collection. Kenosha County has 2 medium priority beaches and 3 low priority beaches all of which are considered 303(d) impaired waters, elevating their priority for BEACH Act funds. In 2015, Marina Beach (aka Melissa Beach) in Pleasant Prairie was removed from the beach list and is no longer considered a recreational beach because it has been deemed unsafe to access. In 2015, Carol Beach was added to the beach list and was sampled two times per week. Carol Beach is currently being considered for a name change and will be updated in the 2016 listing.

Mother Nature Unleashed; Kenosha WI
Photo by Brian Wolf

Monitoring at Alford Park and Southport Park dropped to the contracted frequency of once per week, so fewer samples were collected this year (60 in 2015 compared to 122 in 2014). Two of the beaches had Nowcast models, which were not operational but showed good promise for future use in routine decision-making. Kenosha continued beach restoration work at Simmons Island with a phased implementation that is scheduled to continue into the 2016 season. A map with beach locations for Kenosha County can be found here.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Action Days
1	Alford Park	30	1	3	0	0	1
2N	Eichelman Park	50	12	24	4	8	11
2	Pennoyer Park	34	6	18	4	12	6
3N	Simmons Island Park	45	5	11	2	4	5
2	Southport Park	32	3	9	0	0	3
2	Carol Beach	15	1	7	0	0	0
6	**Kenosha Co. Total**	**206**	**28**	**14**	**10**	**5**	**28**

Kewaunee County

Kewaunee County beach monitoring continued through an assistance agreement with the University of Wisconsin – Oshkosh (UW-O) at the same level in 2015 as 2014. The City of Kewaunee beach is now listed as Selner Park, its local designation. Community members in Algoma expressed concerns about the adequacy of the advisory signage at Crecent Beach, including that the bilingual sign explaining the water quality notices (used to supplement the English language signs) lacked an English translation. The new beach advisory signage, used in conjunction with colored flags posted in visible areas received significant positive feedback by community members and local government.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Action Days
2	Crescent	31	4	13	2	6	4
2	Selner Park	36	10	28	4	11	12
2	**Kewaunee Co. Total**	**67**	**14**	**21**	**6**	**9**	**16**

The city of Algoma and Friends of Crescent beach adopted grooming practices to remove algae from the shoreline and installed several coyote decoys to deter birds from loafing on the beach. These measures have proven effective through the beach season. The community has been successful in securing funding to begin its beach restoration efforts with plans for implementation in 2017.

A map with beach locations for Kewaunee County can be found here.

Crescent Beach photo courtesy of Cathy Pabich

Manitowoc County

Manitowoc County partners with University of Wisconsin – Oshkosh (UW-O) for beach monitoring. Several beaches within the county are identified as impaired on the 303(d) list so were given additional grant funding for sanitary surveys as well as monitoring. Given changes along the Manitowoc County coastline, the county public health department assisted in a more extensive assessment of the coastline that identified additional beach access points along Mariner's Trail. Warm Water Beach was determined to be a utility corridor and an inappropriate location for swimming so it was removed from the beach list.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Action Days
2	Blue Rail Marina Beach	62	31	50	18	29	24
1	Fischer Creek Park	14	6	43	3	21	42
1N	Hika Park	14	2	14	2	14	14
2	Memorial Dr-Mariner's Trail	14	0	0	0	0	0
2	Memorial Dr-Mariner's Trail Parkway	28	0	0	0	0	0
2N	Neshotah Park	53	3	6	0	0	5
2N	Point Beach State Park Concession Stand	55	5	9	2	4	11
2*	Point Beach State Park Lakeshore Picnic Area	55	5	9	2	4	12
2*	Point Beach State Park Lighthouse Picnic Area	55	5	9	2	4	10
2N	Red Arrow Park Manitowoc	53	14	26	6	11	16
1	YMCA	14	6	43	3	21	40
11	**Manitowoc Co. Total**	**417**	**77**	**18**	**38**	**9**	**174**

* Composite sampling considered and approved for Point Beach based on statistical assessment of the water quality data.

A restoration plan for Blue Rain Marina beach is ongoing and will continue into the 2016 swimming season. The USGS developed Nowcast models for 4 beaches in Manitowoc County which were operational in 2014 and continued by UW-O in 2015. UW-O worked with Manitowoc to assess upstream sources of bacteria through a grant with Coastal Management. Multiple beaches in the county received redesign plans through the GLRI grant to UW-O.

A map with beach locations for Manitowoc County can be found here.

Milwaukee County

Multiple government jurisdictions have responsibility for monitoring and making public health decisions for 12 Milwaukee County Great Lakes beaches. Although fewer samples were collected

in 2015 compared to 2014, the County's Public Health Departments used Nowcasting to increase the number of days that water quality was evaluated at several beaches. The city of Milwaukee continued its partnership with the University of Wisconsin – Milwaukee (UW-M) to monitor Bradford, McKinley and South Shore beach.

Testing the Waters. Milwaukee, WI. Photo Credit: Marc Ponto

The northern county beaches are monitored through Northshore Health Department. Atwater Park has an active Friends group to assist with beach management issues. South Milwaukee beaches were monitored through an arrangement with Racine Public Health.

Grant Park received a redesign plan and, following consultation with Dr. Kinzelman, Milwaukee County Parks installed a series of rain gardens to address localized runoff issues. The redesign plan elements address multiple sources and transport mechanisms related to bacterial contamination through the use of bioinfiltration features, wetlands, the infill of standing water, planting native vegetation and beach nourishment. The Milwaukee County Parks Department has continued its gull and goose deterrent effort at Bradford and South Shore beaches with the use of border collie dogs. Migratory Bird Management handles the dogs and plans on continuing their work in 2016.

Milwaukee County has 2 beaches on the 303(b) Impaired Waters List, South Shore beach and Grant Park. Milwaukee County Parks continued its efforts to develop a redesign plan for South Shore beach. The process included regular meetings with stakeholders for input on design proposals. The Coastal Management grant funding the effort is focused on clean marina issues, so its primary focus is addressing the parking area at the South Shore Yacht Club. A significant issue for the area is safe access to multiple user groups including vehicles with large trailered boats, a major bike trail, and pedestrian traffic. The county is seeking funding from multiple sources to implement design plans and Miller-Coors will be providing funding over 5 years to cover some of the work.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Action Days
2	Atwater Park	31	2	6	0	0	7
1	Bayview Park Milwaukee	17	1	6	0	0	1
2	Bender Park	34	1	3	0	0	15
2N	Bradford Beach	72	4	6	1	1	13
2N	Grant Park	33	3	9	2	6	3
2	Klode Park	31	1	3	0	0	7
3	McKinley	71	36	51	9	13	59
2	South Shore	72	49	68	20	28	74
2	Tietjen Doctor's Park	31	2	6	0	0	10
9	**Milwaukee Co. Total**	**392**	**99**	**25**	**32**	**8**	**189**

A map with beach locations for Milwaukee County can be found here.

Ozaukee County

Ozaukee County continued into the second year of their Wisconsin Coastal Management grant to pilot a two tiered Nowcast primarily at Upper Lake Park and to perform sanitary surveys at the

four beaches at Harrington Beach. Funding from this grant stretched the county dollars allocated from the BEACH Act grant into two seasons and provided additional vigilance at the beaches by operating the models on days when the beach is not monitored. Fewer routine samples were collected at the beaches than in 2014 as resources were balanced with sanitary survey efforts. Nowcasts for Harrington Beach State Park beaches have not performed as reliably as desired, so a primary goal of the sanitary survey was to better identify sources contributing bacterial contamination and improve the model's predictive capability. As part of the sanitary survey process, state park staff identified a need to align the beach listings with how they are actually managed, recognizing that there is only one natural landmark distinguishing the north and south beach areas so listings were combined to identify 2 beaches rather than 4.

Ozaukee County Public Health and Land and Water Conservation Departments staff worked closely with WDNR to develop a sampling plan for the sanitary survey that optimized the number of samples within the budget. An inventory of outfalls, field drain tile lines, and other discharge points was considered when investigating sources of *E. coli* at Harrington Beach. Considering the potential sources for bacterial contaminants, the sampling plan included some DNA source analyses to identify host species. Preliminary results indicated mixed sources including human, ruminant and gull markers. The gull fecal contribution is notable in that these birds were not physically observed on the beach. The Fund for Lake Michigan awarded the Ozaukee County Land & Water Management Department $38,500 to further assess and locate sources of *E. coli* at Harrington Beach.

The County Land and Water Conservation department is doing additional investigation upstream of the outfalls to identify sources more specifically. Design plans to address the runoff from the ditches are being re-evaluated in light of the new sanitary survey information. The county has consulted WDNR beach and parks staff throughout the process and these discussions will continue to find a mutually agreeable solution to address the sources of bacterial contamination at Harrington Beach. The sanitary survey report will be used to inform decision-making. A map with beach locations for Ozaukee County can be found here.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Action Days
2	Concordia University	11	0	0	0	0	29
2N	Harrington State Park North	31	5	16	1	3	37
2N	Harrington State Park South	31	3	10	1	3	35
2	Upper Lake Park	64	8	13	2	3	37
4	**Ozaukee Co. Total**	**137**	**16**	**12**	**4**	**3**	**138**

Racine County

Race Time, North Beach, Photo Credit: Scott D. Olsen

The City of Racine places a high priority on monitoring its beaches and uses rapid methods and multiple tools to determine water quality conditions. As a result of continued efforts to improve beach conditions, North Beach was ranked #4 in USA Today's Freshwater Beach competition.

Racine developed Nowcasts using qPCR for both North and Zoo beaches and continues to use a weight of evidence approach to determine whether water quality conditions warrant declaring an advisory. In addition to BEACH Act funding, Racine received a $75,000 grant from the Fund for Lake Michigan to build on a previous award for the continued restoration work at Sam Myers beach in downtown Racine.

These restoration activities continue with special attention to maintaining vegetation that will provide resilience features into future.

Dr. Julie Kinzelman and City of Racine Health Department performed two comprehensive watershed assessments to identify sources of bacterial contamination and developed mitigation plans that have been approved by EPA as Nine Key Element Plans, an important step in securing funding to mitigate non-point source pollution. Through public meetings in the Wind Point watershed area, three additional locations where people access the water were identified. The remaining 2 beaches are identified as low priority and were not funded by BEACH Act funds although the results were reported to the beach health website.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Action Days
2N*	North Beach	260	28	11	0	0	8
1	Parkway Beach	14	0	0	0	0	0
1	Wind Point Lighthouse	14	0	0	0	0	0
2N*	Zoo Beach	192	12	6	3	0	7
4	**Racine Co. Total**	**480**	**40**	**8**	**3**	**0**	**15**

* Composite sampling considered and approved for North and Zoo beaches based on statistical assessment of the water quality data.

A map with beach locations for Racine County can be found here.

Sheboygan County

Sheboygan County received both BEACH Act and Wisconsin Coastal Management funding to provide monitoring for 2015. The county continued its pilot of the two-tiered Nowcast system at three of its beaches with great success. They worked together with their contract laboratory and Blue Harbor resort to provide robust notification about current beach conditions, tailoring the message to their Nowcast system. The beaches at Kohler-Andrae State Park were monitored through an agreement with University of Wisconsin – Oshkosh.

Sheboygan on the 4th of July. Deland Park. Photo Credit: James E. Schultz

Through a GLRI grant to UW-Oshkosh, a redesign plan to address erosion and stormwater from the parking lot at the North Picnic beach was completed. DNR staff worked to identify funding sources to implement this plan. Friends of Kohler-Andrae State Park stepped forward to lead the effort and they received a $90,000 grant from the Fund for Lake Michigan to address stormwater from the parking lot that eroded the dunes and caused significant problems with blowing sand. WDNR's Natural Resource Board accepted the donation from the Friends group with construction scheduled for 2016.

A map with beach locations for Sheboygan County can be found here.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Action Days
1	Amsterdam	17	3	18	1	6	5
2N	Blue Harbor	29	3	10	1	3	0
2N	Deland Park	29	6	20	1	3	0
2N	General King Park	29	6	20	0	0	18
3	Kohler Andrae State Park Picnic Area	85	2	2	0	0	2
3	Kohler-Andrae State Park North/Nature Center	89	4	4	0	0	1
6	**Sheboygan Co. Total**	**278**	**24**	**9**	**3**	**1**	**26**

Lake Superior

Although Lake Superior has a reputation for being quite cold overall, the nearshore waters provide a warmer, inviting place for recreation. Several beaches along the shoreline are quite popular destinations for swimming, canoeing, and kayaking during hot summer days. Tourism is important to the coastal counties, bringing visitors from outside of the area. In previous years, all of the beaches along the Lake Superior coastline have been identified as low priority or Tier 3 and as a result had limited monitoring during the 2013 and 2014 beach seasons. The program reevaluated this assessment during the 2015 review, adjusting tiers at several locations and adjusting beach listings to reflect current understanding of usage. Overall, the beaches along Lake Superior received more intensive monitoring than in the past two seasons and as a result, more advisories being posted and increased public attention on water quality. The Chequamegon Bay Area Partnership group hosted a public meeting on September 2, 2015 that focused on the beach program, monitoring activities, and local partners (city and county) who are involved. People were able to ask questions and provide input on the beach list.

Ashland County

Ashland County monitored seven of the eight coastal beaches and implemented Nowcast models at Kreher Park and Maslowski beaches. As part of their work at the beach and in the Fish Creek watershed, Northland College took samples to identify potential sources of bacterial contamination and began work with Ashland to implement BMPs and begin beach restoration. Ashland identified a boat launch adjacent to Kreher Park that is used frequently and requested that it be added to the program. This beach is proposed for addition to the Wisconsin beach list in 2015. A map with beach locations for Ashland County can be found here.

Fish Creek Fly Over Chequamegon Bay, Photo by DNR.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Actions Days
2	Bayview Park Ashland	25	4	16	0	0	11
7	Big Bay State Park	7	1	14	0	0	7
V	Casper Rd	7	0	0	0	0	0
2N	Kreher Park	30	7	23	1	3	18
V	La Pointe Memorial	7	0	0	0	0	0
2N	Maslowski	34	12	35	3	9	36
2	Sixth Avenue West Boat Launch/Beach	29	4	14	1	3	9
7	**Ashland Co. Total**	**139**	**28**	**20**	**5**	**4**	**81**

Bayfield County

Bayfield County received BEACH Act funding for 11 beaches, a significant increase from the funding allocated to only 2 beaches in 2014. Bayfield County Public Health Department continued implementation of Nowcasting at Thompson West End Park. Based on feedback from county staff about the effort necessary to collect field data, USGS developed a Nowcast that operated entirely with remotely sensed data. The Bayfield health department used this model exclusively

A Family Outing Herbster WI
Photo by Timothy Taylor Moermond

throughout 2015 with great success. Beach restoration at Thompson West End was completed in 2015.

The county opened a new beach in Cornucopia adjacent to Siskiwit beach. Following placement of sand off-shore of the existing Siskiwit beach (Army Corps of Engineers beneficial reuse project), swimmers were directed to the new beach area. Monitoring continued in the swim area. The new beach was added to the list in 2015.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Actions Days
1	Broad St	15	0	0	0	0	0
2	Herbster	30	3	10	0	0	13
1	Little Sand Bay	15	0	0	0	0	0
1	Port Wing East	15	0	0	0	0	0
1	Port Wing West	15	0	0	0	0	0
2	Sioux River North (Onion)	29	0	0	0	0	0
2	Sioux River South (Friendly Valley Road)	29	1	3	0	0	2
2	Siskiwit East	29	1	3	0	0	1
2	Siskiwit West	29	0	0	0	0	0
2N	Thompson West End Park	31	0	0	0	0	0
1	Washington Ave	16	1	6	1	6	1
11	**Bayfield Co. Total**	**253**	**6**	**2**	**1**	**0**	**17**

A map with beach locations for Bayfield County can be found here.

Douglas County

Six of the twelve beaches in Douglas County are within the St. Louis Estuary Area of Concern (AOC), with a number of habitat projects in planning or assessment phases for Wisconsin Point. The master plan for Wisconsin Point identifies multiple property owners that include Douglas County, City of Superior, and the University of Wisconsin. Douglas County Parks planned construction along the Point to reconfigure the parking areas and access points. Although Wisconsin Point 2 has been identified as Moccasin Mike, its coordinates coincide with Schaefer Beach, which is being managed as piping plover habitat. Access to this beach and Wisconsin Point 3 (Dutchman Creek) is restricted during the nesting season (until about July 15) with provisions to close the beach until about August 15 if a nest is detected. As part of the AOC habitat plan, design work has begun to enhance this habitat area and additional dune nourishment is planned. With these activities in mind, we worked with Douglas County Parks and Health Departments to reevaluate the beach listings to align with current usage, local names, and available access points. This resulted in the removal of three listings because they are no longer beaches and the shoreline area along Wisconsin Point was divided into 6 beaches rather than 5.

More than twice the number of samples were collected in 2015 (280 samples) compared to 2014 (104 samples). In 2015, Douglas County received $6000 of BEACH Act funding, whereas in 2014 there was no BEACH Act funding allocated to the County. The Superior Parks department reported implementing procedures to discourage nuisance geese on the Barkers Island beach.

Swimmers at Barker's Island Photo by DNR

To better understand the source of the bacterial contaminants, samples that exceeded the water quality standard as well as additional investigative samples were sent to Dr. Sandra McLellan's laboratory at the University of Wisconsin - School of Freshwater Science for DNA analyses. A large number of birds frequent the area around Wisconsin Point 2 and the source sampling will help determine whether other sources for the bacterial exceedances exist along Wisconsin Point.

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Actions Days
2	Barker Island Inner	58	23	40	6	10	60
2	Lot 1 to monument at Lot #9 (WP #1)*	58	15	26	4	7	58
2	Shaefer Beach (WP #2)*	45	17	38	8	18	0
1	Dutchman Creek (WP #3)*	45	13	29	3	7	38
2	South-East of Breakwater (WP #4)*	26	2	8	0	0	8
2	Lighthouse Beach (WP #5)*	26	0	0	0	0	0
2	Wisconsin Point Lot 12 next parking area	22	2	9	1	5	9
7	**Douglas Co. Total**	**280**	**72**	**26**	**22**	**8**	**173**

* Wisconsin Point (WP). Beach names reflect designations regularly used by beachgoers and the general community.

A map with beach locations for Douglas County can be found here.

Iron County

Saxon Harbor
Photo by Jennifer Schreiber

Based on the annual evaluation, the Oronto Bay beaches were collapsed into a single listing. Conversations with local residents indicate that Saxon Harbor is a popular water recreation destination, which can be seen when visiting the area. The beach grant funded monitoring at Saxon Harbor (contract with UW-O) and monitoring at Oronto Bay occurred voluntarily. As a result of this funding, significantly more monitoring occurred. The total number of samples increased in Saxon Harbor from a total of 9 in 2014, to 29 in 2015 (combined for both beaches).

2015 Contract Frequency	Beach	Samples	Exceedances (≥ 235)	Exceedances (%)	Closures (≥ 1000)	Closures (%)	Beach Actions Days
0	Oronto Bay #1	43	0	0	0	0	0
1	Saxon Harbor East	15	0	0	0	0	0
1	Saxon Harbor West	14	0	0	0	0	0
3	**Iron Co. Total**	**72**	**0**	**0**	**0**	**0**	**0**

A map with beach locations for Iron County can be found here.

Lessons Learned and Improvement Opportunities

BEACH Act funding continues to be a cornerstone for Wisconsin's Great Lakes Beach Program. WDNR took advantage of the flexibility incorporated into the BEACH Act grant to include provisions for collecting routine sanitary survey parameters in the 2015 contracts, a key step for assuring continuity of data sets needed to evaluate models and the effects of implementing best management practices (BMPs) and other contaminant mitigation efforts. To support that effort, the data entry screen on Beach Health was updated to include these parameters, making data collection more convenient and data capture more reliable. Review of historic sanitary survey data indicates that a number of data sets are incomplete or may include inaccurate entries, limiting their utility.

Monitoring frequency reported to EPA's databases can be challenging to verify because the funded monitoring frequency and the frequency implemented locally often do not match, timing of resampling varies and results of sanitary survey samples are included in our reporting. Our conventions for recording advisories also made it more challenging to verify advisory days. We have updated our procedures for assigning ending dates and times to the advisories. Although a significant number of beaches have had sanitary surveys to identify primary sources of bacterial contaminants, this information is not always recorded in our database. For locations with multiple sources of contamination, it may be speculative to report the cause for exceedances without DNA source tracking data or an exceptional event (e.g., major storm). Based on review of source tracking data along the coastline, bird DNA is found almost universally regardless of whether or not they are observed loafing along the beach. For beaches influenced by stream or other watershed sources, larger scale investigations and source identification projects are necessary to assure that mitigation efforts are successful.

A number of counties reported changes in coastline access or management of beach areas that involve removing beaches from the list or consolidating beach listings. State parks staff expressed concern that our beach list does not match their list of swimming beaches, which may have implications for property management. After the 2015 beach season, we invested significant effort in evaluating the coastline and doing public outreach to identify needed changes to Wisconsin's beach listings including adjusting the names to more closely align with how locations are known locally and to be more descriptive of the location. Even with this effort, we found that more changes will be necessary. The program has minimal resources to keep beach measurements up-to-date in response to changes in the landscape such as changes in lake levels, presence of invasive species like phragmites, restoration activities and shoreline erosion. Our local partners have been extremely helpful in providing updated information; however, their resources are limited as well. Few coastal beaches have lifeguards available to count the number of people using the beach so local beach managers rely on subjective assessments of beach usage to inform assignment to tiers.

As indicated in the Kewaunee county narrative, the signs posted at the beaches need re-evaluation with a focus on multi-lingual messaging. Conversations with stakeholders indicate that signs are often ignored and simple messaging is often more effective. We will need to focus more attention and target resources to update the signage, messaging and communication plan. The Department of Administration's Coastal Program has assisted by funding pilot projects to improve communication.

On-the-ground beach management is often the purview of parks departments which often requires coordination to post signs, manage litter, and implement best management practices (BMPs). Additionally, beaches are often adjacent to public infrastructure, so developing effective management practices may involve Public Works or Transportation departments. Departments

managing green infrastructure initiatives may include the regional planning, local planning and zoning departments or the wastewater utility. When considering the number of departments with functions that may affect beach management, our stakeholders have come to appreciate the importance of coordinating beyond the usual department boundaries, particularly when implementing beach restorations.

Wisconsin DNR has placed a priority on using BEACH Act grant resources for on-the-ground monitoring and notification system activities. Local partners have emphasized the need to have secure beach monitoring funding for program implementation on a cycle that aligns with city and county budget planning. Funding through the BEACH Act has provided critical impetus for implementing beach management practices and restorations to improve water quality. In locations that have seen an economic benefit from improved beach conditions, securing funding for monitoring may be somewhat easier, but it can be a tough case to make, particularly in communities with limited tax base or other resources. Program partners expend exceptional effort to leverage funding from multiple sources to accomplish monitoring, implement BMPs, and restore coastal beaches. Grant funders have been more receptive to projects with defined issues and concrete solutions. Most staffing and program administration costs have been covered by other sources. The result is that timeliness of the administrative processes (e.g., contracts and grant reporting) and attention to program needs suffer as the program coordinator balances these responsibilities with other job duties. It's unclear how long this situation can continue given increasing workload and current fiscal realities.

Based on our experience this past year, several updates to our IT infrastructure are necessary. We are working with USGS to enhance the data system and internal reports to streamline the process for quality assuring the beach attributes and advisory data. As indicated earlier in this report, we intend to revise some of our reporting procedures to make the quality assurance process more efficient. Perhaps most important is the need to stabilize the architecture of EnDDaT and the GLOS systems that serve the data so they are reliable and data are regularly available in near real-time during the beach season. Adam Mednick has been collaborating with USGS, NOAA, the Great Lakes Commission and EPA to address these identified issues, however resources to accomplish this have been uncertain. Without support to fix system glitches, local Nowcast adopters discontinue using their models. This situation highlights the need to provide on-going maintenance for systems that are developed if the funders and developers intend for those tools to be useful in the long-term.

The beach program provides a uniform mechanism to evaluate water quality and report data. Should funding be withdrawn entirely, counties have little incentive to report their data to EPA. Additional resources are necessary to support Nowcasting, maintenance and enhancement of information technology tools to support more real-time notification systems, and at beaches that have implemented restoration or other mitigation efforts, enhanced monitoring to re-establish relationships between water quality and predictive conditions. Current efforts include forming a Virtual Beach users group to develop expertise and make the Nowcasting a more sustainable effort. Feedback from some of the communities that use Nowcasts indicate that disruptions in the data flow through EnDDaT erode confidence in the reliability of this tool.

After the 2014 efforts invested in quality assuring the data in BEACON, USGS updated its process for reviewing the data and created reports in Beach Health that reduced the effort necessary to quality assure seasonal data. Advisory data in the system proved difficult to use without. As a result, we re-evaluated our reporting conventions and have standardized the number of beach days to align with our beach season, an effort that continued into 2015. Previously, the date of the first sample was used as the beginning date, which in some cases did not match the number of days the beach was open.

Recreational Water Quality Criteria – Status of Rule Revision

As a condition for receiving BEACH Act grant funding, Wisconsin must revise its recreational water quality criteria to be consistent with the federal rules. Our current process for revising administrative rules requires the preparation of a scoping document that must be approved by the Governor. The scope development process was completed during 2015 and received Governor's approval in late October 2015. The Water Evaluation Section within the Water Quality Bureau is leading the rule revision process that will involve multiple administrative codes. Given the nature of the federal rule, Wisconsin administrative codes NR 102, NR 104, NR 210 and NR 219 may need revision. The rule revision and related work includes:

Changes to the recreation water quality standards, including

- Re-evaluation of the recreation designated use
- Revisions of the recreation water quality criteria, such as
    - Switching to *E. coli* as the indicator bacteria
    - Evaluation of risk level for selecting the most appropriate criteria
    - Addition of language that allows for the development of bacteria site-specific criteria

Changes to wastewater implementation procedures for bacteria, including

- Re-evaluation of effluent limits, monitoring requirements, and disinfection requirements

Re-evaluation of the assessment protocols for making recreation impairment decisions, including

- Evaluation of using alternate indicators, multiple data sources and methods (e.g. traditional microbiology, qPCR), and predictive modeling for impairment decisions

Once draft rule language is complete, the next steps are to draft an economic impact analysis and seek public input on that analysis, hold public hearings, and obtain Natural Resources Board approval on the rule language.

The Beach Program will provide supporting data and technical information throughout the development process. Current procedures used for issuing beach advisories are equivalent to implementing a Beach Action Value (BAV) at 235 colonies/100 mL as described in the federal rule. The Beach Program will continue using this BAV throughout the rulemaking process. Once rule revisions are enacted, the program will determine the effect on the BAV and how this is implemented within the program.

APPENDIX

2015 Beach Action Summary

In 2015, the monitoring program covered 10,908 beach days (108 days per monitored beach). Of the 101 monitored beaches 68 experienced advisories or closures (collectively termed a beach action). This is not unexpected given that the monitoring plan is weighted toward detecting water quality exceedances and advising the public. Beach actions are most commonly the result of high levels of measured *E. coli*, modeling with Nowcasting, or are issued preemptively based on beach conditions (e.g., rainfall, high waves, bluff failures) that can be expected to affect swimming conditions. Local public health departments have discretion in issuing preemptive advisories. Most of our monitoring organizations do not have access to laboratory facilities over the weekend so advisories issued on Friday may last until the following Monday when staff are available again. A few beaches are only monitored weekly, so by default, any beach action would last a minimum of 7 days. National Weather Service began forecasting dangerous currents and this information was available to beach managers. It should be noted that Ozaukee County issued preemptive advisories based on the dangerous current forecast which contributed to the overall number of advisories experienced at Ozaukee County beaches.

Across Wisconsin's coastal counties, a total of 622 beach actions were issued: 491 lasted a single day and an additional 50 actions lasted 2 days. In other words, 87% of beach actions returned to open conditions in 2 days or less. Set in context of the number of beach days available in the swimming season, 1023 beach days (9.4%) were affected by advisories or closures. Beaches that do not appear in Tables 1 or 2 did not have any beach actions.

Appendix Table 1. Summary of Beach Action Durations ≤ 2 Days by Lake Michigan Beach

County	Beach	# Beach Actions	Beach Action Days	% Resolved in ≤ 2 Days
Door	Anclam Park	2	2	100
	Bailey Harbor Ridges Park	2	2	100
	Clay Banks #2	2	2	100
	Egg Harbor	7	7	100
	Ephraim Village	7	7	100
	Europe Bay #1	1	1	100
	Europe Bay #2	1	1	100
	Europe Bay #3	1	1	100
	Fish Creek	17	17	100
	Haines Park	1	1	100
	Lakeside Park	1	1	100
	Frank E. Murphy Park	3	3	100
	Nicolet Bay at Peninsula State Park	9	9	100
	Otumba Park	4	16	75
	Percy Johnson Memorial Park	4	5	100
	Sand Bay #1	4	4	100
	Sandy Bay Town Park	1	2	100
	School House	1	1	100
	Sister Bay Park	3	4	100
	Sunset Park Sturgeon Bay	4	4	100

County	Beach	# Beach Actions	Beach Action Days	% Resolved in ≤ 2 Days
	Whitefish Dunes State Park	4	4	100
Kenosha	Alford Park	1	1	100
	Eichelman Park	9	13	88.9
	Pennoyer Park	5	6	100
	Simmons Island Park	5	5	100
	Southport Park	3	3	100
Kewaunee	Crescent	4	4	100
	Selner Park	10	12	100
Manitowoc	Blue Rail Marina	10	24	80
	Fischer Creek Park**	10	42	80
	Hika Park**	1	14	0**
	Neshotah Park	3	5	66.7
	Point State Park Concession Stand	9	11	100
	Point State Park Lakeshore Picnic Area	10	12	100
	Point State Park Lighthouse Picnic Area	8	10	100
	Red Arrow Manitowoc	10	16	90
	YMCA**	5	40	0**
Milwaukee	Atwater Park	3	7	66.7
	Bayview Park Milwaukee	1	1	100
	Bender Park	8	15	62.5
	Bradford Beach	12	13	100
	Grant Park	3	3	100
	Klode Park	2	7	0
	McKinley	49	59	93.9
	South Shore	68	74	95.6
	Tietjen Doctors Park	3	10	33.3
Ozaukee	Harrington State Park North	28	37	92.9
	Harrington State Park South	26	35	92.3
	Upper Lake Park	28	37	92.9
	Concordia University	24	29	95.8
Racine	North	7	8	100
	Zoo	6	7	100
Sheboygan	Amsterdam	3	5	100
	General King Park	8	18	50
	Kohler Andrae State Park North/Nature Center	2	2	100
	Kohler Andrae State Park Picnic Area	1	1	100

Appendix Table 2. Summary of Beach Actions with Durations ≤ 2 Days by Lake Superior Beach

County	Beach+	Beach Actions	Beach Action Days	% Resolved in ≤ 2 Days
Ashland*	Bayview Park Ashland	4	11	25
	Big Bay State Park**	1	7	0**
	Kreher Park	7	18	28.6
	Maslowski	10	36	60
	Sixth Avenue West Boat Launch/Beach	4	9	50
Bayfield	Herbster***	3	13	0***
	Sioux River South (Friendly Valley Road)	1	2	100
	Siskiwit East	1	1	100
	Washington Ave	1	1	100
Douglas*	Barker Island Inner	5	60	0
	Lot 1 to monument at Lot #9 (WP #1)++	4	58	0
	Dutchman Creek (WP #3) ++	3	38	0
	Wisconsin Point (WP) Lot 12	2	9	0
	South-East of Breakwater (WP #4) ++	2	8	0

++Wisconsin Point beach stretches and names were adjusted in 2015 to reflect identifiable access points available to people

***** Both Ashland and Douglas Counties used a geometric mean value of 126 MPN/100 mL in addition to the exceedance threshold of 235 MPN/100 mL. This extended the number of days advisories were in effect during the summer. As an example, Barker's Island Inner beach had an advisory in place between July 14 and August 14 when several successive samples exceeded the threshold value. Three samples collected between July 21 and July 27 had results of 126, 156, and 93 MPN/100 mL. Had the threshold value been used alone, there would have been no advisory in effect during that time. A separate sanitary survey project occurred at the Douglas County beaches; however the results were not used for advisory purposes. When evaluating the entire data set, results indicate that water quality conditions can be quite variable even within a single day at the Wisconsin Point beaches

** Big Bay State Park was monitored voluntarily and based on staff availability. As a beach located on an island, transportation costs limited the sampling frequency to weekly.

******* All three advisories at Herbster occurred late in the week so the advisory extended over the weekend.

2016 Wisconsin Beach List

Beach Name (by County)	Public Usage	Nearest Town	Monitored	Min. Frequency	Tier	Latitude	Longitude	EPA Beach ID	Beach Length (Mi)	Start Latitude	Start Longitude	End Latitude	End Longitude
Ashland	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA Beach ID**	**Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Bayview Park Ashland	Beach	Ashland	Yes	2/week	2	46.6029810	-90.8642550	WI883392	0.097	42.98078	-87.86031	42.98846	-87.87199381
Big Bay State Park	Beach - Island	La Pointe	Voluntary	0	3	46.8076890	-90.6760400	WI937015	1.397	46.79893	-90.66855	46.81725	-90.67549937
Big Bay Town Park	Beach - Island	La Pointe	No	0	3	46.8188100	-90.6745450	WI985506	0.224	46.81722	-90.67548	46.82009	-90.67319937
Casper Rd	Beach - Island	La Pointe	No	0	3	46.7525940	-90.7830970	WI415576	0.040	46.75245	-90.78328	46.75243	-90.7829462
Kreher Park	Beach	Ashland	Yes	2/week Nowcast	2	46.5975530	-90.8809550	WI664128	0.170	46.599	-90.87993	46.59714	-90.88222331
La Pointe Memorial	Beach - Island	La Pointe	No	0	3	46.7750750	-90.7840480	WI492046	0.067	46.77436	-90.78389	46.77533	-90.78450742
Maslowski	Beach	Ashland	Yes	2/week Nowcast	2	46.5834360	-90.9207530	WI134911	0.271	46.58309	-90.91676	46.58439	-90.92309168
Sixth Avenue West Boat Launch and Beach	Beach and Boat Launch	Ashland	Yes	2/week	2	46.5907140	-90.8906210	WI510356	0.040	46.5972	-90.8815	46.597	-90.8822
								Total Miles	*2.306*				
Bayfield	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Bark Bay	Beach - no road access	Herbster	Volunary	0	3	46.8503700	-91.1947960	WI612731	1.197	46.84394	-91.17271	46.85882	-91.20444032
Broad St	Beach (adjacent to boat launch)	Bayfield	Yes	1/week	2	46.8076520	-90.8171770	WI092383	0.022	46.80725	-90.81718	46.80743	-90.81693057
Herbster	Beach	Herbster	Yes	2/week	2	46.8363780	-91.2574770	WI104571	1.494	46.83811	-91.25461	46.83534	-91.26100274
Highway 13 Wayside	Shoreline wayside	Port Wing	No	0	3	46.7569530	-91.5133580	WI226688	0.091	46.75723	-91.51243	46.75713	-91.51428084
Little Sand Bay	Beach and adjacent Marina	Sand Bay	Yes	1/week	2	46.9473830	-90.8885790	WI665352	0.271	46.94745	-90.88781	46.94689	-90.88969795
Memorial Park Bayfield	Beach (adjacent to ferry area)	Bayfield	Volunary	0	3	46.8107540	-90.8132490	WI627331	0.021	46.81031	-90.81302	46.81059	-90.81272431
Meyers - Apostle Islands National Seashore	Beach (National Lakeshore)	Cornucopia	Federal	NA	2	46.8836070	-91.0488860	TBD	0.637	46.8823	-91.0517	46.8889	-91.0409
Port Wing East	Beach and Boat Launch	Port Wing	Yes	1/week	2	46.7937090	-91.3697040	WI159171	0.626	46.79607	-91.364	46.79222	-91.37586717
Port Wing West	Beach and natural area	Port Wing	Yes	1/week	2	46.7901460	-91.3923010	WI347339	0.785	46.7886	-91.38584	46.78912	-91.38893154
River Loop Rd	Private beach	Port Wing	No	0	3	46.7679210	-91.4843740	WI887162	0.032	46.76788	-91.48399	46.76778	-91.48472787

2016 Wisconsin Beach List

Beach Name (by County)	Public Usage	Nearest Town	Monitored	Min. Frequency	Tier	Latitude	Longitude	EPA Beach ID	Beach Length (Mi)	Start Latitude	Start Longitude	End Latitude	End Longitude
Sioux River North (aka Onion)	Beach	Washburn	Yes	2/week	2	46.7479430	-90.8840650	WI728716	0.175	46.74691	-90.88331	46.74922	-90.88437081
Sioux River South (aka Friendly Valley Road)	Beach	Washburn	Yes	2/week	2	46.7374040	-90.8781370	WI666189	1.133	46.73112	-90.87494	46.74691	-90.88331201
Siskiwit East (aka Cornie)	Beach	Cornucopia	Yes	2/week	2	46.8595130	-91.0999860	WI197157	0.308	46.86093	-91.09715	46.85932	-91.10366939
Siskiwit West (aka Cornie by Marina)	Beach	Cornucopia	Yes	2/week	2	46.8581920	-91.1035690	WI877155	0.220	46.8588	-91.103	46.8568	-91.1066
Thompson West End Park	Beach (adjacent to boat launch)	Washburn	Yes	2/week Nowcast	2	46.6657360	-90.9048870	WI275933	0.065	46.66532	-90.90498	46.66604	-90.90427157
Washburn Walking Trail (aka BAB)	Beach	Washburn	Voluntary	0	3	46.6677760	-90.8940630	WI437149	0.064	46.66759	-90.89448	46.66766	-90.89350295
Washington Ave	Beach	Bayfield	Yes	1/week	2	46.8127440	-90.8119790	WI984993	0.105	46.81212	-90.812	46.81357	-90.81189087
Wikdal Memorial Boat Launch	Boat Launch and adjacent beach	Washburn	Voluntary	0	3	46.6663910	-90.9020330	WI151032	0.034	46.66628	-90.90234	46.66648	-90.90168089
								Total Miles	*7.280*				
Brown Beaches	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Bay Beach	Inactive - no access	Green Bay	No	Special Project	NA	44.5323230	-87.9793270	WI851239	0.280	44.53167	-87.97685	44.53359	-87.98202305
Bayshore Park	Off-shore boating	Green Bay	No	0	3	44.6380190	-87.7981320	WI740597	0.370	44.63821	-87.79385	44.63792	-87.80130693
Communiversity Park	Boat Launch	Green Bay	No	0	3	44.5363670	-87.9286380	WI403290	0.265	44.53792	-87.92692	44.53512	-87.93054856
Joliet Park	Carry in boat launch	Bay Settlement	No	0	3	44.5516480	-87.9146940	WI488049	0.215	44.55283	-87.91384	44.55034	-87.91581228
Long Tail Point (North and South)	Wildlife area - no road access	Green Bay	No	0	3	44.6023490	-87.9882920	WI477262	0.260	44.59606	-88.01448	44.62498	-88.00799069
Sunset Beach Road	Boat Launch	Suamico	No	0	3	44.6307290	-88.0095500	WI744516	0.019	44.62037	-88.00629	44.632	-88.01140291
Town of Scott Park	Carry in boat launch	Dyckesville	No	0	3	44.6198640	-87.8552150	WI268522	0.017	44.61954	-87.85517	44.61962	-87.85551789
Van Lanen	Beach	Wequiock (Gree	No	0	3	44.5674990	-87.9028100	WI405669	0.012	44.56747	-87.90265	44.56727	-87.90281882
Volks Landing Boat Launch	Boat Launch	Dyckesville	No	0	3	44.6186890	-87.8429680	WI851821	0.022	44.61872	-87.84278	44.61866	-87.84318426
								Total Miles	*1.460*				

2016 Wisconsin Beach List

Beach Name (by County)	Public Usage	Nearest Town	Monitored	Min. Frequency	Tier	Latitude	Longitude	EPA Beach ID	Beach Length (Mi)	Start Latitude	Start Longitude	End Latitude	End Longitude
Door Beaches	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Anclam Park	Beach	Baileys Harbor	Yes	1/week	2	45.0586480	-87.1241760	WI501955	0.010	45.05879	-87.12379	45.05888	-87.12389386
Arrowhead Ln	Beach	Sturgeon Bay	No	0	3	44.8610680	-87.2342430	WI648903	0.034	44.86082	-87.23441	44.86114	-87.23387728
Bailey Harbor Ridges Park	Beach	Baileys Harbor	Yes	2/week	1	45.0696920	-87.1180890	WI914897	0.088	45.06962	-87.11902	45.07006	-87.11732105
Bittersweet Ln (South of Shiver Sands Creek)	Beach	Sturgeon Bay	No	0	3	44.8586310	-87.2403630	WI454590	0.035	44.85843	-87.24061	44.85864	-87.23999462
Braunsdorf	Private Beach	Claybanks	No	0	3	44.6995290	-87.3558690	WI982339	0.112	44.68963	-87.36295	44.69109	-87.36212135
Chippewa Dr	Beach	Sturgeon Bay	No	0	3	44.8124470	-87.2895720	WI822170	0.019	44.81233	-87.28972	44.81243	-87.28936632
Clay Banks #1 (South of Schyler Creek State Fishery Area)	Beach	Claybanks	No	0	3	44.7089970	-87.3495520	WI722618	0.170	44.70815	-87.35037	44.7102	-87.34854407
Clay Banks #2 (Hornspier Rd)	Beach	Claybanks	Yes	1/week	3	44.7593020	-87.3277110	WI198915	0.628	44.75525	-87.33121	44.76275	-87.32460708
Cliff View Dr	Beach	Sturgeon Bay	No	0	3	44.8788560	-87.4568990	WI571574	0.010	44.87883	-87.45678	44.87876	-87.45697896
County Rd TT	Beach	Sturgeon Bay	No	0	3	44.8351910	-87.2752910	WI509669	0.015	44.83502	-87.27515	44.83523	-87.27504159
Deer Path Ln	Beach	Sturgeon Bay	No	0	3	44.8543470	-87.2521230	WI690474	0.011	44.85427	-87.2522	44.85433	-87.25199533
Egg Harbor	Beach	Egg Harbor	Yes	2/week	1	45.0456290	-87.2859050	WI421809	0.062	45.04587	-87.28533	45.04558	-87.28660175
Ellison Bay Town Park	Beach	Ellison Bay	Yes	2/week	1	45.2528830	-87.0775760	WI797561	0.017	45.2529	-87.07736	45.25288	-87.07769465
Ephraim Village	Beach	Ephraim	Yes	2/week	1	45.1501270	-87.1750320	WI062070	0.054	45.15048	-87.17465	45.15009	-87.17558405
Europe Bay #1	Beach	Northport	Yes	1/week	2	45.2646300	-86.9838430	WI890519	0.798	45.24998	-86.98303	45.26964	-86.97827606
Europe Bay #2	Beach	Northport	Yes	1/week	2	45.2588680	-86.9848510	WI186833	0.089	45.24998	-86.98303	45.25943	-86.98503534
Europe Bay #3	Beach	Northport	Yes	1/week	2	45.2560220	-86.9843010	WI902641	0.301	45.24998	-86.98303	45.25812	-86.98488804
Fish Creek	Beach	Fish Creek	Yes	2/week	1	45.1276160	-87.2432120	WI805969	0.031	45.12834	-87.24006	45.12779	-87.24355587
Garrett Bay Boat Launch	Boat Launch	Gills Rock	No	0	3	45.2858180	-87.0511350	WI641392	0.011	45.28547	-87.04156	45.28576	-87.05130434
Gislason Beach	Beach - Island	Washington Isla	Yes	1/week	2	45.3403180	-86.9088490	WI218684	0.039	45.33998	-86.90882	45.34053	-86.90907256
Goldenrod Ln	Beach	Sturgeon Bay	No	0	3	44.8642960	-87.2283170	WI239741	0.010	44.86407	-87.22832	44.86413	-87.22813624
Haines Park	Beach	Little Sturgeon	Yes	1/week	2	44.8550070	-87.5043790	WI826309	0.011	44.85484	-87.50409	44.85468	-87.5042924
Hemlock Ln	Beach	Sturgeon Bay	No	0	3	44.8563690	-87.2465180	WI458895	0.034	44.85614	-87.24673	44.85637	-87.24613571
Isle View Rd	Beach	Northport	No	0	3	45.2819320	-86.9721250	WI201331	0.011	45.2746	-86.97304	45.28199	-86.97213224
Jackson Harbor Ridges	Beach - Island	Jacksonport	Yes	1/week	2	45.3970450	-86.8518610	WI171560	0.121	45.39744	-86.85307	45.39691	-86.85078396
Kickapoo Dr	Beach	Sturgeon Bay	No	0	3	44.8055160	-87.3035210	WI868378	0.019	44.80538	-87.30361	44.80556	-87.30331839
Lakeshore Dr Door	Beach	Jacksonport	No	0	3	44.9611480	-87.1883820	WI279186	0.007	44.96107	-87.1886	44.96124	-87.18861797

2016 Wisconsin Beach List

Beach Name (by County)	Public Usage	Nearest Town	Monitored	Min. Frequency	Tier	Latitude	Longitude	EPA Beach ID	Beach Length (Mi)	Start Latitude	Start Longitude	End Latitude	End Longitude
Douglas Beaches	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Allouez Bay #3 - Lot 10	Boat Launch	Itasca (Superior)	No	0	3	46.6917300	-91.9879980	WI578209	0.052	46.69182	-91.98842	46.69159	-91.98762669
Amnicon River	Beach	Amnicon Falls	No	0	3	46.6915840	-91.8571330	WI545475	0.242	46.69113	-91.85732	46.69131	-91.8580537
Barker Island Inner	Beach and Marina	Superior	Yes	2/week	2	46.7202370	-92.0599260	WI887548	0.009	46.71858	-92.06027	46.72	-92.06220909
Brule River State Forest #1	Beach	Port Wing	No	0	3	46.7477050	-91.6107600	WI137478	0.227	46.74861	-91.60797	46.74749	-91.61171197
Brule River State Forest #2	Beach	Port Wing	No	0	3	46.7466150	-91.6141440	WI750300	0.203	46.74749	-91.61171	46.74516	-91.61663315
Brule River State Forest #3	Beach	Port Wing	No	0	3	46.7151710	-91.7289730	WI983384	0.274	46.71576	-91.72606	46.71406	-91.73127652
Middle River	Beach	Wentworth	Yes	0	3	46.6899310	-91.8292810	WI741058	0.132	46.69015	-91.82801	46.68982	-91.83057687
Wisconsin Point #1 (Lot 1 to monument at Lot #9)	Beach	Itasca (Superior)	Yes	2/week	2	46.6885300	-91.9778100	WI888427	0.75	46.68570	-91.9715	46.6917	-91.9842
Wisconsin Point #2 (Shaefer Beach)	Closed for habitat breeding through July 15	Itasca (Superior)	Yes	2/week	3	46.6815890	-91.9575750	WI669980	0.919	46.68011	-91.94736	46.68343	-91.96596042
Wisconsin Point #3 (Dutchman Creek)	Closed for habitat breeding through July 15	Itasca (Superior)	Yes	1/week	3	46.6798550	-91.9422890	WI573145	0.27	46.6802	-91.9395	46.6801	-91.945
Wisconsin Point Lot 12 to next parking area	Beach	Itasca (Superior)	Yes	2/week	2	46.6656000	-91.9914000	WI731926	0.4	46.6952	-91.9908	46.6917	-91.9842
Wisconsin Point #4 (south-east of breakwater)	Beach	Itasca (Superior)	Yes	2/week	2	46.6993490	-91.9981360	WI831163	1.17	46.6952	-91.9908	46.70540	-92.00970
Wisconsin Point #5 (lighthouse)	Beach	Itasca (Superior)	Yes	2/week	2	46.7057580	-92.0122500	WI956099	0.22	46.7054	-92.0097	46.7067	-92.0138
								Total Miles	*4.868*				
Iron Beaches	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Oronto Bay #1	Beach	Cedar	No	0	3	46.5728550	-90.4705030	WI895483	2.16	46.5673	-90.4567	46.5844	-90.495
Saxon Harbor East	Beach	Cedar	Yes	1/week	2	46.5622260	-90.4354500	WI157254	0.218	46.56201	-90.4364	46.56201	-90.43639949
Saxon Harbor West	Beach and Boat Launch	Cedar	Yes	1/week	2	46.5625150	-90.4414830	WI960543	0.427	46.56273	-90.44091	46.56295	-90.44190277
								Total Miles	*2.805*				

2016 Wisconsin Beach List

Beach Name (by County)	Public Usage	Nearest Town	Monitored	Min. Frequency	Tier	Latitude	Longitude	EPA Beach ID	Beach Length (Mi)	Start Latitude	Start Longitude	End Latitude	End Longitude
Kenosha Beaches	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Alford Park	Beach	Kenosha	Yes	2/week	2	42.6131820	-87.8198940	WI371142	0.672	42.60753	-87.81915	42.62193	-87.81949527
Eichelman Park	Beach	Kenosha	Yes	3/week	2	42.5799680	-87.8130140	WI197731	0.129	42.58025	-87.81419	42.58093	-87.81200145
Carol Beach (aka Lakeshore Dr -Lk MI Beach)	Beach	Pleasant Prairie	Yes	2/week	2	42.5165370	-87.8107660	WI277295	0.342	42.51399	-87.81027	42.52048	-87.81176414
Lakeshore Dr at 116th St.	Beach (no parking area)	Pleasant Prairie	No	0	3	42.5240920	-87.8119660	TBD	0.120	42.50754	-87.80806	42.50586	-87.807154
Pennoyer Park	Beach	Kenosha	Yes	2/week	2	42.6046960	-87.8181430	WI130707	0.287	42.60362	-87.81758	42.60362	-87.81757715
Prairie Harbor Yacht Club	Private Beach	Pleasant Prairie	No	0	3	42.4945550	-87.8033720	TBD	0.060	42.49487	-87.80355	42.49413	-87.803003
Simmon Island Park	Beach	Kenosha	Yes	3/week	2	42.5910510	-87.8134890	WI892494	0.579	42.5888	-87.81264	42.59628	-87.81532371
Southport Park	Beach	Kenosha	Yes	2/week	2	42.5620390	-87.8121170	WI400905	0.165	42.56082	-87.81242	42.56378	-87.81255606
								Total Miles	*2.354*				
Kewaunee Beaches	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
9th Ave Wayside	Shoreline wayside	Algoma	No	0	3	44.5656850	-87.4577530	WI241184	0.172	44.56428	-87.45878	44.56647	-87.45697756
Cresent	Beach	Algoma	Yes	2/week	2	44.6042610	-87.4377130	WI608310	0.536	44.59964	-87.43971	44.60657	-87.43537142
Selner Park (aka City Park)	Beach	Kewaunee	Yes	2/week	2	44.4561000	-87.4995000	WI620050	0.521	44.45638	-87.4994	44.45538	-87.5001029
Father Marquette Memorial Park (aka Lighthouse Vista)	Beach	Kewaunee	No	0	3	44.4646420	-87.4958370	WI901066	0.040	44.4643	-87.49592	44.46469	-87.4953379
Pioneer Park	Beach	Kewaunee	No	0	3	44.4569000	-87.4991000	TBD	0.020	44.457	-87.499	44.4567	-87.4992
Red River Park	Boat ramp and natural area	Dyckesville	No	0	3	44.6682870	-87.7478420	WI633041	0.062	44.66845	-87.74738	44.66711	-87.74842058
								Total Miles	*1.351*				
Manitowoc Beaches	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Fischer Creek Park	Natural Area	Cleveland	Yes	1/week	3	43.9382240	-87.7187320	WI125039	0.985	43.93778	-87.71904	43.93778	-87.7190438
Hika Park	Boat Launch	Cleveland	Yes	1/week - Nowcast	3	43.9162250	-87.7236400	WI932022	0.039	43.91593	-87.72359	43.91676	-87.72353393
Lincoln Highschool	Beach	Manitowoc	No	0	3	44.0783870	-87.6554820	WI705121	0.083	44.0779	-87.65593	44.07912	-87.65568846

2016 Wisconsin Beach List

Beach Name (by County)	Public Usage	Nearest Town	Monitored	Min. Frequency	Tier	Latitude	Longitude	EPA Beach ID	Beach Length (Mi)	Start Latitude	Start Longitude	End Latitude	End Longitude
Blue Rail Marina Beach	Beach and Boat Launch	Manitowoc	Yes	2/week	2	44.1002850	-87.6487980	WI792119	0.079	44.10002	-87.64902	44.1008	-87.6484841
Memorial Dr - Mariner's Trail Parking at Parkway (formerly known as Memorial Dr Wayside North)	Beach	Two Rivers	Yes	2/week	2	44.1367247	-87.587435	WI136397	1.734	44.13033	-87.60275	44.14151	-87.57056615
Memorial Dr - Mariner's Trail Parking at Thiede Rd	Beach	Two Rivers	Yes	2/week	2	44.1328000	-87.5979000	WI866687	0.26	44.1338	-87.5943	44.1323	-87.599
Area at Waldo (formerly known as Wayside South)	Beach	Manitowoc	Yes	1/week	2	*44.1090000*	*-87.6415*	WI422085	0.265	44.10869	-87.64119	44.11167	-87.63778086
Neshotah Park	Beach	Two Rivers	Yes	2/week Nowcast	2	44.1497130	-87.5555350	WI821179	0.854	44.14493	-87.56278	44.15334	-87.54913072
Point State Park Concession Stand	Beach	Two Rivers	Yes	2/week Nowcast	2	44.2236440	-87.5072640	WI997982	0.62	44.2208	-87.50737	44.22966	-87.50842792
Point State Park Lakeshore Picnic Area	Beach	Two Rivers	Yes	Composite	2	44.2177030	-87.5069250	WI538951	0.473	44.21399	-87.50723	44.2208	-87.50736672
Point State Park Lighthouse Picnic Area	Beach	Two Rivers	Yes	Composite	2	44.2107420	-87.5072230	WI510658	0.442	44.15741	-87.54292	44.21399	-87.50723205
Red Arrow Manitowoc	Beach	Manitowoc	Yes	2/week Nowcast	2	44.0760640	-87.6557350	WI012139	0.272	44.07387	-87.65586	44.0779	-87.65592807
Silver Creek	Natural Area	Manitowoc	No	0	3	44.0611740	-87.6534310	WI465036	0.272	44.05906	-87.65386	44.06297	-87.65356186
Two Creek Boat Launch	Boat Ramp	Two Creeks	No	0	3	44.3073910	-87.5449030	WI350293	0.632	44.30225	-87.54392	44.30552	-87.54445273
University	Beach	Manitowoc	No	0	3	44.0646160	-87.6535810	WI564320	0.242	44.06297	-87.65356	44.06639	-87.65370312
YMCA	Beach	Manitowoc	Yes	1/week	3	44.0948090	-87.6515390	WI279226	0.088	44.09412	-87.6516	44.09528	-87.65145906
								Total Miles	***7.340***				
Marinette Beaches	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Michaelis Park	Natural Area	Marinette	No	0	3	45.0400020	-87.6254640	WI218531	0.093	45.01158	-87.62523	45.04474	-87.6258129
Peshtigo Harbor Boat Launch	Boat Launch	Peshtigo	No	0	3	44.9730380	-87.6561970	WI819664	0.131	44.9751	-87.65584	44.97367	-87.6555244
Red Arrow Marinette #1	Beach	Marinette	No	0	3	45.0888610	-87.5890140	WI936169	0.413	45.08732	-87.58739	45.09139	-87.59268493
Red Arrow Marinette #2	Beach	Marinette	No	0	3	45.0859610	-87.5866520	WI111115	0.068	45.08593	-87.58595	45.08658	-87.5867582
Red Arrow Marinette #3	Beach/Natural Area	Marinette	No	0	3	45.0819140	-87.5834960	WI997460	0.468	45.07894	-87.58054	45.08494	-87.58500309

2016 Wisconsin Beach List

Beach Name (by County)	Public Usage	Nearest Town	Monitored	Min. Frequency	Tier	Latitude	Longitude	EPA Beach ID	Beach Length (Mi)	Start Latitude	Start Longitude	End Latitude	End Longitude
								Total Miles	*1.173*				
Milwaukee Beaches		**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Atwater Park	Beach	Shorewood	Yes	2/week	2	43.0901250	-87.8728840	WI607583	0.15	43.08925	-87.8723	43.09551	-87.87508276
Bayview Park Milwaukee	Beach	St.Francis	Yes	1/week	2	42.9847720	-87.8657380	WI628125	0.398	46.60326	-90.86336	46.60268	-90.86491194
Bender Park	Beach	Oak Creek	Yes	2/week	2	42.8676890	-87.8395070	WI977064	0.09	42.86716	-87.83959	42.86849	-87.84000478
Big Bay Park	Beach	Whitefish Bay	No	0	3	43.1090570	-87.8882770	WI247909	0.154	43.10817	-87.88742	43.10995	-87.88933809
Bradford Beach	Beach	Milwaukee	Yes	2/week - nowcast	1	43.0618330	-87.8730780	WI312597	0.523	43.05891	-87.87532	43.06439	-87.86911016
Grant Park	Beach	South Milwauke	Yes	2/week - nowcast	1	42.9122320	-87.8402980	WI429764	0.194	42.90662	-87.84108	42.90662	-87.84107682
Klode Park	Beach	Whitefish Bay	Yes	2/week	2	43.1244970	-87.8998250	WI291459	0.089	43.12399	-87.89985	43.12495	-87.90024071
Lakeshore State Park	Beach	Milwaukee	Yes	Event	3	43.0314810	-87.8961200	TBD	0.08	43.03181	-87.89664	43.03118	-87.895674
McKinley	Beach	Milwaukee	Yes	3/week	3	43.0532870	-87.8818070	WI234408	0.114	43.05271	-87.88282	43.05426	-87.88119518
Sheridan Park	Beach	Cudahy	No	1/week	3	42.9574570	-87.8448820	WI265434	0.905	42.95232	-87.84398	42.95232	-87.84397797
South Shore	Beach	Milwaukee	Yes	2/week	3	42.9950520	-87.8814470	WI333813	0.094	42.99475	-87.8806	42.99566	-87.88183584
Tietjen Doctors Park	Beach	Bayside	Yes	2/week	2	43.1718020	-87.8811260	WI746946	0.831	43.16688	-87.88253	43.17799	-87.88393148
Watercraft Beach (McKinley Jetski Launch)	Boat Launch	Milwaukee	Yes	1/week	3	43.0550280	-87.8795010	WI987935	0.187	43.05444	-87.881	43.0564	-87.87850493
								Total Miles	*3.809*				
Oconto Beaches		**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Oconto City Park	Beach	Oconto	No	0	3	44.8586720	-87.8550990	WI455048	0.041	44.85752	-87.85495	44.85888	-87.85420948
								Total Miles	*0.041*				
Ozaukee Beaches		**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
Harrington State Park North	Beach	Belgium	Yes	2/week - nowcast	1	43.4960400	-87.7927130	WI407836	0.60	43.49927	-87.79346	43.4929	-87.791
Harrington State Park South	Beach	Belgium	Yes	2/week - nowcast	1	43.4890670	-87.7927120	WI564539	0.46	43.4929	-87.791	43.49926	-87.793458
Jay Rd	Beach	Belgium	No	0	3	43.5284670	-87.7940270	WI926427	0.006	43.52847	-87.79436	43.52857	-87.79434961

2016 Wisconsin Beach List

Beach Name (by County)	Public Usage	Nearest Town	Monitored	Min. Frequency	Tier	Latitude	Longitude	EPA Beach ID	Beach Length (Mi)	Start Latitude	Start Longitude	End Latitude	End Longitude
Lions Den Gorge Nature Preserve	Natural Area	Grafton	*No*	*0*	*3*	43.3420370	-87.8830910	WI750163	0.682	43.33749	-87.88422	43.34722	-87.88220871
Pebble Beach Rd Ozaukee	Beach	Cedar Grove	No	0	3	43.5430680	-87.7914370	WI727293	0.012	43.54296	-87.79217	43.54324	-87.79219977
Sandy Beach Rd	Beach	Belgium	No	0	3	43.4704740	-87.8022010	WI944539	0.015	43.47024	-87.80191	43.47048	-87.80182487
Silver Rd	Beach	Belgium	No	0	3	43.5138630	-87.7935680	WI922794	0.012	43.51383	-87.79398	43.51404	-87.79394237
Upper Lake Park	Beach	Port Washingtor	Yes	2/week	2	43.3960410	-87.8622120	WI652173	0.364	43.39367	-87.86385	43.39815	-87.86026009
Concordia University	Beach	Mequon	Yes	2/week	2	43.2529880	-87.911144	WI135037	0.05	43.2533	-87.9111	43.2526	-87.9112
Virmond County Park	Beach	Mequon	No	0	3	43.2123480	-87.8963400	WI624360	0.2	43.2133	-87.8958	43.2104	-87.8956
								Total Miles	*2.397*				
Racine Beaches	**Public Usage**	**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitude**	**Start Longitude**	**End Latitude**	**End Longitude**
5 1/2 Mile Road	*Beach - Public access point*	*Caledonia*	*Voluntary*	*1/week*	*TBD (3)*	*42.8066460*	*-87.7939650*	*TBD*	*0.04*	*42.8068*	*-87.7944*	*42.8064*	*-87.7939*
Olympia Center (Curley Rd)	*Beach - Public access point*	*Caledonia*	*Voluntary*	*1/week*	*TBD (3)*	*42.7983840*	*-87.7817950*	*TBD*	*0.18*	*42.7991*	*-87.7831*	*42.7975*	*-87.7804*
Siena Center	*Beach - Public access point*	*Caledonia*	*Voluntary*	*1/week*	*TBD (3)*	*42.7958860*	*-87.7774230*	*TBD*	*0.2*	*42.7966*	*-87.7791*	*42.7947*	*-87.776*
North	Beach	Racine	Yes	2/week - nowcast - qPCR - composite	1	42.7411200	-87.7803270	WI721390	0.597	42.73777	-87.77858	42.73777	-87.77858113
Parkway	Beach	North Bay	Yes	1/week	3	42.7643400	-87.7772320	WI889003	0.066	42.76384	-87.77751	42.76499	-87.77682937
Wind Point Lighthouse	Beach	Wind Point	Yes	1/week	3	42.7811850	-87.7574640	WI718147	0.058	42.78085	-87.75776	42.78163	-87.75779619
Zoo	Beach	Racine	Yes	2/week - nowcast - qPCR - composite	1	42.7486210	-87.7814480	WI988510	0.332	42.74592	-87.78209	42.75214	-87.78127485
								Total Miles	*1.053*				
Sheboygan Beaches		**Nearest Town**	**Monitored**	**Min. Frequency**	**Tier**	**Latitude**	**Longitude**	**EPA_Bch_ID**	**Beach Length (Mi)**	**Start Latitu**	**Start Longit**	**End Latitu**	**End Longitude**
3rd St	Beach	Sheboygan	No	0	3	43.7751180	-87.7064760	WI986407	0.157	43.77406	-87.70585	43.77616	-87.70688077

2016 Wisconsin Beach List

Beach Name (by County)	Public Usage	Nearest Town	Monitored	Min. Frequency	Tier	Latitude	Longitude	EPA Beach ID	Beach Length (Mi)	Start Latitude	Start Longitude	End Latitude	End Longitude
Amsterdam	Beach	Cedar Grove	Yes	1/week	3	43.5583470	-87.7915110	WI410541	0.107	43.55771	-87.79212	43.55915	-87.79172295
Blue Harbor	Beach	Sheboygan	Yes	2/week - nowcast	1	43.7437710	-87.7069360	WI252842	0.152	43.7435	-87.70796	43.74501	-87.70558604
Deland Park	Beach	Sheboygan	Yes	2/week - nowcast	1	43.7591680	-87.7023800	WI949936	0.876	43.75485	-87.70222	43.76432	-87.69552938
Foster Rd	Beach	Oostburg	No	0	3	43.6221720	-87.7474000	WI365989	0.011	43.62221	-87.74757	43.62239	-87.74741101
General King Park	Beach	Sheboygan	Yes	2/week - Nowcast	1	43.7393580	-87.7092940	WI217913	0.738	43.73283	-87.71002	43.7435	-87.7079636
KK Rd	Beach	Oostburg	No	0	3	43.6293070	-87.7418370	WI902958	0.017	43.62943	-87.7422	43.62972	-87.74198803
Kohler-Andrae State Park North/ Nature Center	Beach	Sheboygan	Yes	3/week	1	43.6650920	-87.7167750	WI526839	1.340	43.65934	-87.72095	43.67654	-87.70880419
Kohler-Andrae State Park Picnic Area (North and South)	Beach	Sheboygan	Yes	3/week	1	43.6570120	-87.7221610	WI406325	0.580	43.6572	-87.7222	43.6548	-87.72378204
Lakeview Park	Beach	Sheboygan	No	0	3	43.7202160	-87.7070740	WI394243	0.380	43.71769	-87.70637	43.72238	-87.70822304
Van Ess Rd	Beach	Oostburg	No	0	3	43.6067510	-87.7602980	WI518118	0.007	43.60688	-87.76057	43.60701	-87.76047007
Vollrath Park	Boat Launch	Sheboygan	No	0	3	43.7710650	-87.7039010	WI975330	0.316	43.76904	-87.70253	43.77315	-87.70536772
Whitcomb Ave	Beach	Sheboygan	No	0	3	43.7234360	-87.7084090	WI858481	0.033	43.72314	-87.70844	43.72365	-87.70852032
Wilson Lima (aka Whites)	Beach	Oostburg	No	0	3	43.6434020	-87.7310430	WI634281	0.012	43.64344	-87.73149	43.64368	-87.7313552
								Total Miles	*4.726*				

		Monitored	101
Wisconsin Beach Count	181	Voluntary	6
		Not Monitored	74

Wisconsin Beach Miles ***49.8***