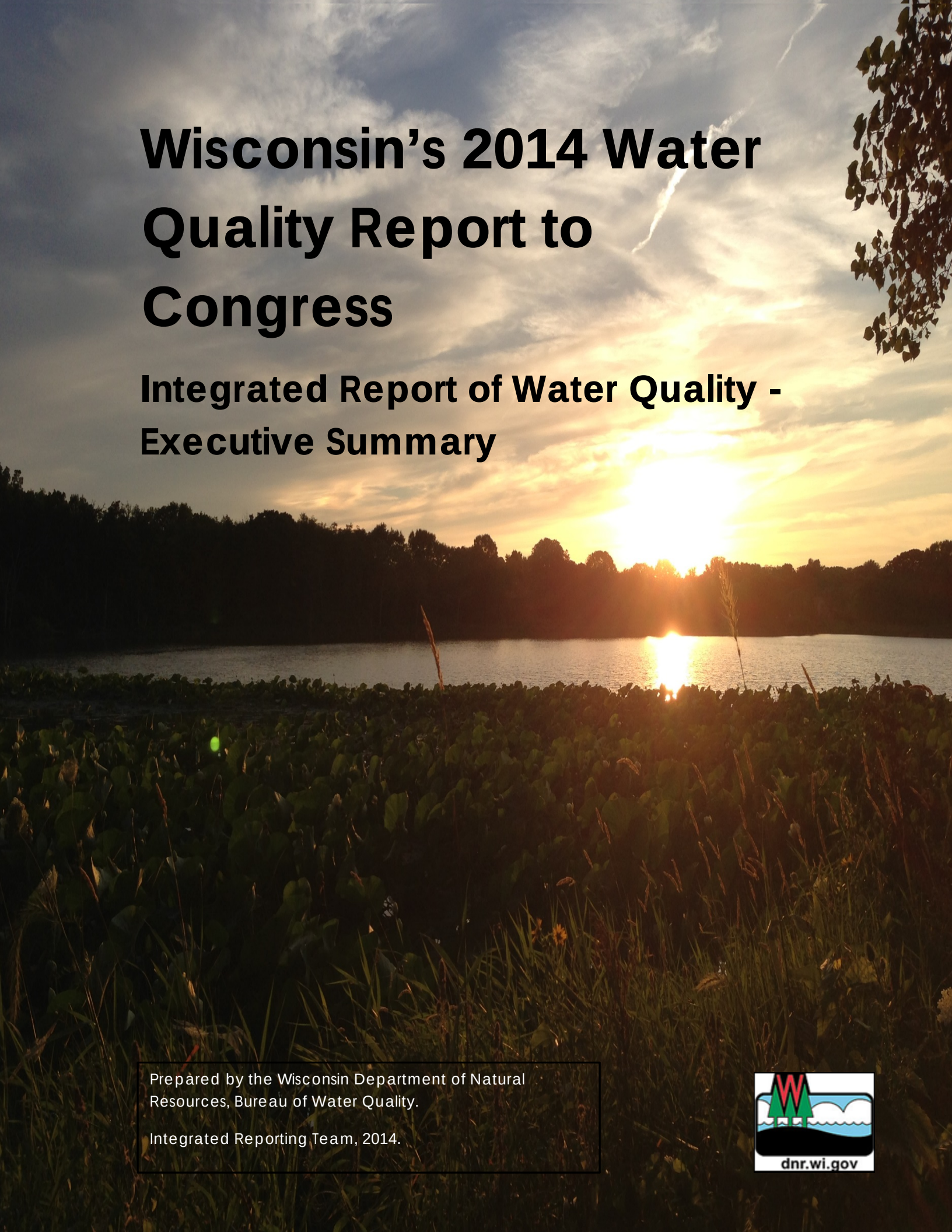

Wisconsin's 2014 Water Quality Report to Congress

Integrated Report of Water Quality - Executive Summary

Prepared by the Wisconsin Department of Natural Resources, Bureau of Water Quality.

Integrated Reporting Team, 2014.

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INTRODUCTION

Wisconsin hosts bountiful natural resources, including a variety of lakes, streams, wetlands, aquifers, and springs. Every other year, the Wisconsin Department of Natural Resources (WDNR) assembles water quality information and reports status and trends to the United States Environmental Protection Agency (US EPA), which in turn shares this information with the United States Congress.

Wisconsin's 2014 Water Quality Report to Congress ("2014 Integrated Report") is available online. This digital version provides broad descriptions of water quality programs, emerging issues and new initiatives, and summary reports of current water quality conditions that are dynamically linked to WDNR's centralized databases.

The executive summary report highlights the process and results of this 2014 Biennial Water Quality Report to Congress, which was last published April 2012. The Water Quality Report to Congress fulfills reporting requirements under Sections 303(d), 305(b), and 314 of the Clean Water Act.

WATER QUALITY STANDARDS

Water quality standards help protect Wisconsin's water resources from pollution and support the requirements of the Clean Water Act, by:

- Determining the types of activities the water should support, also commonly referred to as a waterbody's "Designated Uses"
- Developing water quality criteria to protect these Designated Uses from excess pollution
- Establishing an antidegradation policy to maintain and protect existing uses and high quality waters

Water quality standards for surface waters are outlined in Chapters NR 102, 104, and 105 of the Wisconsin Administrative Code. Water quality standards serve as the benchmark in determining the health of the waterbody, helping to identify a range of conditions from the highest quality waters (Outstanding and Exceptional Resources Waters) to the impaired waters of the State.

DESIGNATED USES

As part of water quality standards, each waterbody is assigned a Designated Use. Classifying waters into each Designated Use category involves science that reflects an evaluation of the resource and its natural characteristics. Wisconsin's designated uses are:

- Fish and Aquatic Life: All surface waters are considered appropriate for the protection of fish and other aquatic life. Surface waters vary naturally with respect to factors like temperature, flow, habitat, and water chemistry. This variation allows different types of Fish and Aquatic Life communities to be supported. Five subcategories for fish and aquatic life uses are outlined in s. NR 102.04, Wis. Adm. Code.

- Recreational Use: All surface waters are considered appropriate for recreational use unless a sanitary survey has been completed to show that humans are unlikely to participate in activities requiring full body immersion.
- Public Health and Welfare: All surface waters are considered appropriate to protect for incidental contact and ingestion by humans. All waters of the Great Lakes as well as a small number of inland waterbodies are also identified as public water supplies and have associated water quality criteria to protect human health. Fish consumption use also falls under this category.
- Wildlife: All surface waters are considered appropriate for the protection of wildlife that relies directly on the water to exist, or relies on it to provide food for existence.

ASSESSMENT METHODOLOGY

Chapter NR 102, Wisconsin Administrative Code, establishes water quality standards for surface waters of the State, and describes the Designated Use categories and the water quality criteria necessary to support these uses. The State is responsible for assigning designated uses, and conducting periodic assessments of these uses on individual waterbodies. Implementation of our surface water quality standards is described in various guidance documents, including guidance on assessment of surface water quality data against applicable water quality standards.

WDNR's water quality assessment goal is to use clearly defined and publicly accessible methods for collection and analysis of data to ensure scientifically defensible assessment decisions. Wisconsin's Consolidated Assessment and Listing Methodology (WisCALM) was updated in 2014. WDNR's website provides a full version of the.

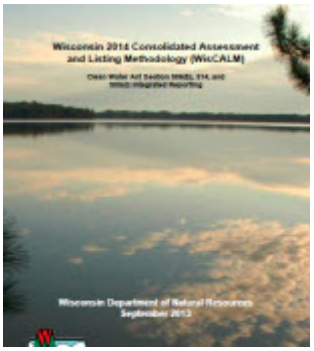

FIGURE 1 WISCALM 2014 [CLICK TO OPEN]

WISCALM – YEAR 2014 CHANGES TO ASSESSMENT METHODOLOGY

- Clarifications of and revisions to minimum data requirements and assessment methods for water temperature and dissolved oxygen.
- Updates to describe revised protocols for assessment of fish and aquatic life and recreation uses based on total phosphorus, chlorophyll, and macrophyte data.
- Creation of a new reporting category for impaired waters within watershed improvement project areas for which TMDL development would be a low priority.
- Revisions to incorporate updated stream natural community classifications and corresponding assessment tools, including the coolwater fish biotic index and nonwadeable macroinvertebrate biotic index, as well as applicable condition category and listing thresholds.
- Explanation of how DNR will resolve data gaps left after determining samples are unrepresentative.

Data Used for Assessment

Data submitted by the public and data collected through WDNR's monitoring program is used for assessments. The monitoring data used to make assessment decisions is stored in the Surface Water Integrated Monitoring System (SWIMS) and the Fisheries Database. Assessment data for the State's Integrated Report are stored in the State's Water Assessment, Tracking and Electronic Report System (WATERS). The public can view spatial (or GIS) data and written information about each waterbody using the WDNR's interactive mapping tool, the Surface Water Data Viewer (SWDV) and the searchable water detail pages: (http://dnr.wi.gov/water/watersearch.aspx). WDNR staff ensures all data used for assessments meet quality assurance requirements and data are representative of current conditions.

In addition to Department-generated data, every two years, WDNR seeks information from partners and the public to use in its assessment of waterbodies. Partners include the U.S. Geological Survey, USEPA, U.S. Fish and Wildlife Service, state agencies, universities, regional planning commissions, and municipal sewerage districts. In the development of the 2014 impaired waters list, WDNR held a data solicitation period from January 1 to March 1, 2013. The data request was distributed in a press release, GovDelivery service and posted on our website during the solicitation period. The format for submitting data and a table of commonly assessed parameters and minimum data requirements were provided in the call for data.

The Surface Water Data Viewer provides interactive GIS based datasets showing

As datasets are submitted, WDNR reviews the data and the procedures used to collect and analyze the data. WDNR will review information provided by any individual or group at any time; however, the data used for listing purposes must have been obtained using documented quality assurance procedures that meet WDNR procedures. WDNR follows the State Quality Management Plan for the collection of data. Data submitters outside of WDNR are referred to EPA's site for questions on quality assurance project plans.

Agencies and individuals submitting data for assessments must: meet minimum data requirements, demonstrate that sample collection occurred at appropriate sites, during appropriate periods, and use certified laboratories for sample analysis. If the quality assurance procedures are not adequate, staff may use this data to initiate further investigations by Department staff. If quality assurance procedures are adequate, WDNR may use this data to assess the water for possible impairment listing.

WDNR may assist outside groups in the design and implementation of data quality procedures necessary for data to be used for assessments. Department staff will consult with EPA water quality criteria guidance, state WQS, and use professional judgment to interpret the results of field sampling to determine whether or not WQS are achieved. Groups outside of WDNR who regularly collect and submit data to WDNR may work with staff at Central Office to upload data into the SWIMS database to be considered as part of our evaluation and assessment process.

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WDNR also supports a Citizen Based Monitoring Program for rivers, streams and lakes. As stated in the WDNR's Water Resources Monitoring Strategy for Wisconsin, "If citizens follow defined methodology and quality assurance procedures, their data will be stored in a Department database and used in the same manner as any Department-collected data for status and trends monitoring defined in the Strategy." Citizen data are currently used for water quality assessments, including broad-scale statewide assessments.

Statewide Designated Use Support Status

The vast number of water resources in the state precludes monitoring and assessing all waters within a reasonable timeframe. WDNR generally prioritizes the collection of water quality data for waters within targeted watershed areas, or waters within areas that are showing degradation or impairment. Over time, additional waters will be monitored, assessed and updated in the assessment database to ensure the documentation of the state's water conditions are as comprehensive as possible.

WDNR uses four levels of condition in describing a waterbody's current status within the overall water quality continuum. Waters assigned the condition category of "excellent" are considered to be attaining applicable WQS and fully supporting their assessed designated uses. Waters assigned the condition category of "good" or "fair" are also considered to be attaining applicable WQS and supporting their assessed designated uses. Waters assigned the poor condition category may not be attaining WQS or assessed designated use(s). Waters determined to be in poor condition based on Tier 1 monitoring data are further evaluated and may be selected for additional monitoring or, if the limited dataset includes overwhelming evidence of impairment (e.g. large magnitude of exceedance), considered "impaired" and added to Wisconsin's Impaired Waters List.

Two major goals of the Clean Water Act—fishable and swimmable waters—are represented by Wisconsin's designated uses for recreation and fish and aquatic life. A third designated use, public health and welfare, was also assessed but to a very limited degree. While not an official designated use, fish consumption was also analyzed. Waters are placed in one of the following condition groups, depending on results:

- Fully supporting
- Supporting
- Not supporting
- Not assessed

General Water Condition Continuum

Excellent	Fully Supporting Designated Use
Good	Supporting Designated Use
Fair	Supporting Designated Use
Poor	Not Supporting Designated Use*

When water quality criteria for the protection of a designated use are not met, the water is considered "**not supporting**" or "**impaired**". Fish consumption is considered "not supporting" where specific consumption advice is in effect due to elevated contaminants in fish tissue.

Streams and Rivers Assessments for Designated Uses

The state contains an estimated 88,000 stream miles from approximately 54,000 discrete rivers and streams; however, fewer stream miles (42,468) are delineated and documented in the Department's WATERS database. However, the database contains a majority of the larger stream and rivers in the state.

Fish and aquatic life (FAL) use is the primary most regularly assessed use in streams/rivers – 19,625 stream miles (46% of stream miles in the WATERS database) have been assessed for FAL use support (Table 1). Of the stream miles assessed, approximately 70% are supporting FAL uses. The FAL use assessments are primarily based on Indices of Biotic Integrity calculated from macroinvertebrate sample and fish survey data. A very small amount of stream miles have been assessed for fish consumption and recreational uses, as these assessments are often conducted in response to a known problem or specific program need, such as a county health department monitoring program for swimming uses.

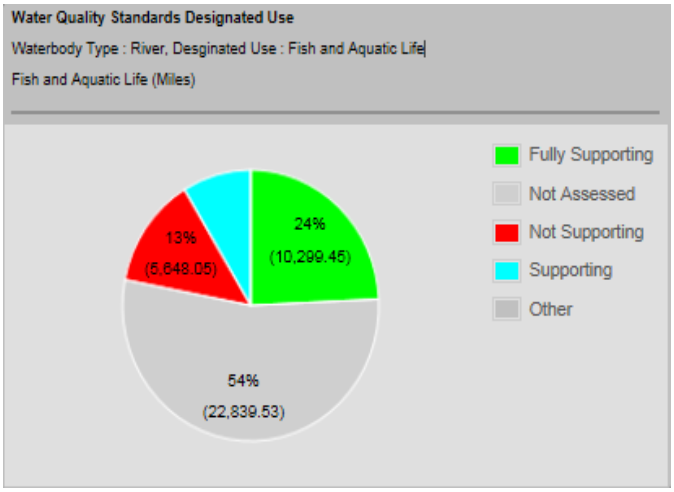


FIGURE 3 RIVER - FISH AND AQUATIC LIFE USES

Table 1. Stream and river miles assessed for designated uses (see also figure 3).

Assessed Uses	Fully Supporting	Supporting	Not Supporting	Not Assessed	Total Size
Fish and Aquatic Life	10,299	3,677	5,648	22,844	42,468
Recreation	4	9	120	42,334	42,468
Fish Consumption	11	122	1,250	41,084	42,468
General*	0	0	231	42,237	42,468

* "General Use" is used in this instance for ambient water quality criteria exceedances in the Mississippi River.

Lakes Assessments for Designated Uses

Recreation and fish and aquatic life (FAL) uses are the primary designated uses assessed for lakes (Table 2). WDNR assessed FAL use of 793,899 lake acres using a combination of in-lake water quality samples and water clarity data gathered from satellite imagery. Wisconsin's Citizen Lake Monitoring Network data, combined with satellite imagery analysis developed by the DNR's Science Services Program, contributed greatly to the 2014 assessments. Over 1,200 volunteers who sample 800 lake stations each year; this data is

extrapolated based on modeling techniques with satellite data to provide assessments for over 6,000 lakes in the state. Based on these assessments, approximately 69% of assessed lake acres are supporting the FAL use. The recreation use of over 50,000 acres of additional lakes were assessed in this

Table 2. Lake acres assessed for designated uses.

Assessed Uses	Fully Supporting	Supporting	Not Supporting	Not Assessed	Total Size
Fish and Aquatic Life	187,204	359,606	247,088	161,679	955,577
Recreation	126,796	68	261,906	566,807	955,577
Fish Consumption	7,437	17,558	247,952	682,631	955,577

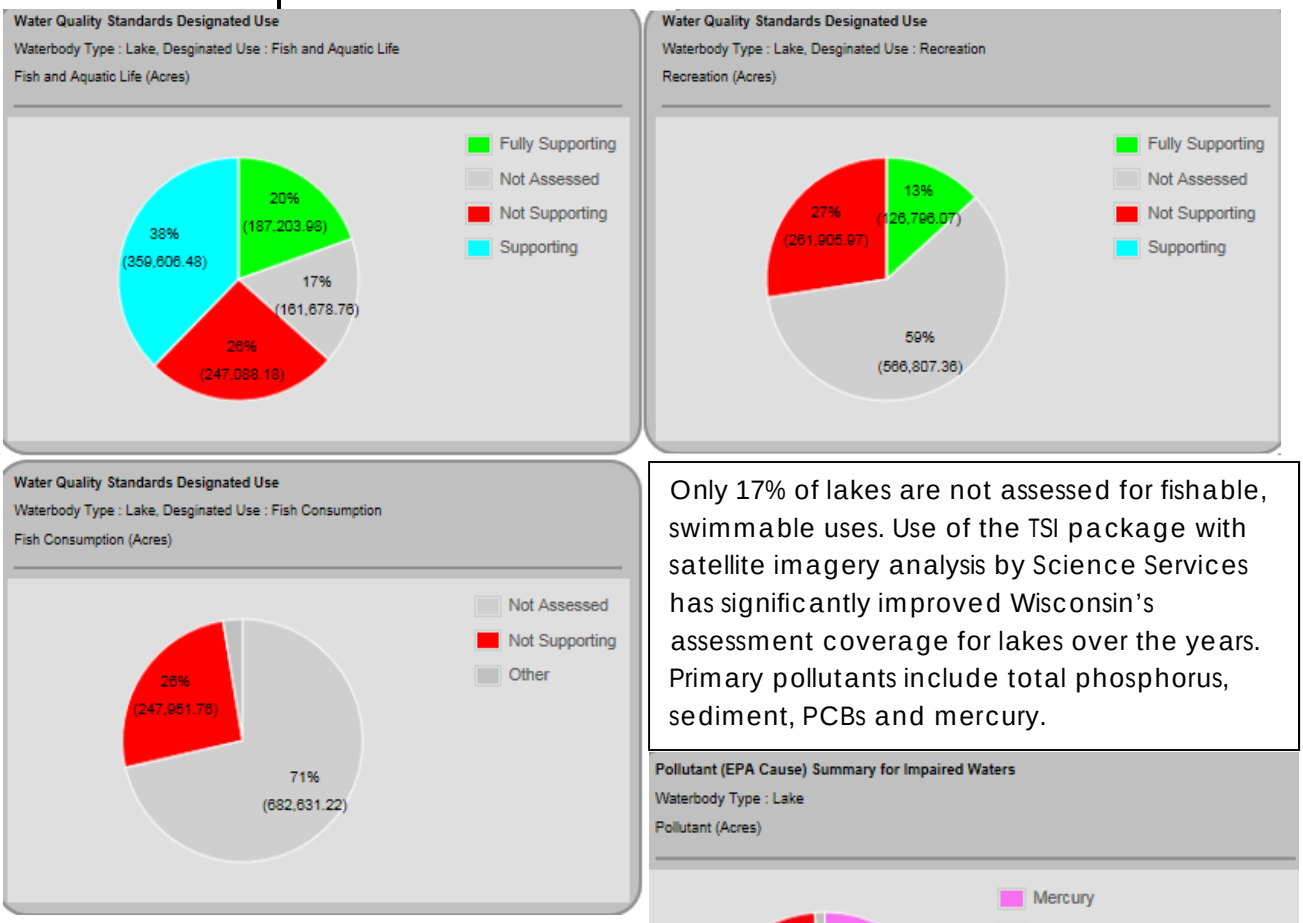


FIGURE 4 LAKE DESIGNATED USE ASSESSMENTS

Only 17% of lakes are not assessed for fishable, swimmable uses. Use of the TSI package with satellite imagery analysis by Science Services has significantly improved Wisconsin's assessment coverage for lakes over the years. Primary pollutants include total phosphorus, sediment, PCBs and mercury.

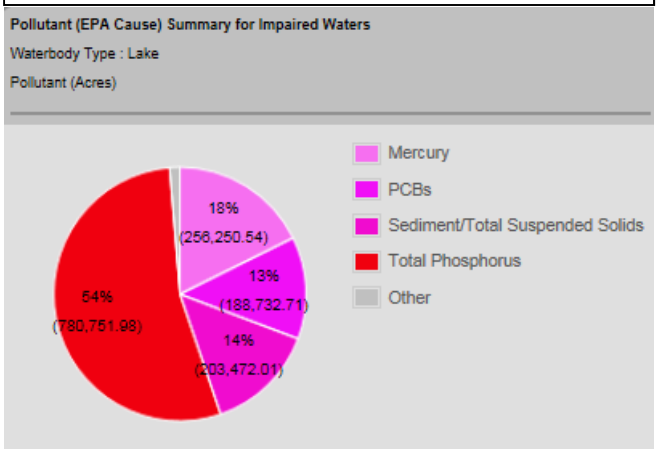


FIGURE 5 LAKE POLLUTANTS

IMPOUNDMENT ASSESSMENTS FOR DESIGNATED USES

Impoundments are bodies of water created by structures (dams) which hold water either permanently or in a controlled fashion. Many of Wisconsin's large impoundments provide electricity service, controlled through the FERC process. Similar to natural lakes, WDNR primarily assesses the recreation and fish and aquatic life (FAL) uses for impoundments. Due to landscape and morphological features of impoundments (sediment transport, collection of nutrients and algal debris, a majority of impoundments assessed do not support fishing and swimming and are listed as impaired (75,139 acres, 63%) and a large majority of impoundments assessed (83,064 acres or 95%) do not support recreation use (Table 3). Due, in part, to the accumulation of sediment behind riverine structures and proclivity of pollutants (organic contaminants and metals) to attach to sediment, a large proportion of impoundments (80,906 acres or 89%) do not support fish consumption (i.e. these waters have specific advise that recommend strict limits on the number and type of fish consumed).

FIGURE 6 LAKE DESIGNATED USES AND POLLUTANTS

As the table and graphs indicate, a large proportion of impoundment acres are in impaired condition, with the primary pollutants polychlorinated hydrocarbons (PCBs, total phosphorus, dioxin, and mercury.

Table 3. Summary of impoundment acres assessed and designated use support status.

Assessed Uses	Fully Supporting	Supporting	Not Supporting	Not Assessed	Total Size
Fish and Aquatic Life	19,174	24,878	75,139	3,964	123,155
Recreation	4,131	65	83,064	35,896	123,155
Fish Consumption	0	9,654	80,906	32,595	123,155

Beaches Assessments for Designated Uses

Wisconsin's beaches provide wildlife habitat, recreation areas and tourist destinations. Beaches are especially vulnerable to agricultural, urban and industrial land uses, and some of our beaches are showing the effects of improper land management practices. Still, of the approximately 55 miles of Great Lake and inland beaches assessed, 39 miles (71%) were supporting the recreation use. Conversely, 16 miles (29%) of beaches were not supported the recreation use, mostly due to elevated levels of *E. coli* – a bacterial indicator of potential risks to human health (Table 4).

Table 4. Great Lakes and Inland Beach miles assessed for recreational use.

Assessed Uses	Fully Supporting	Supporting	Not Supporting	Not Assessed	Total Size
Recreation	34	5	16	2	57

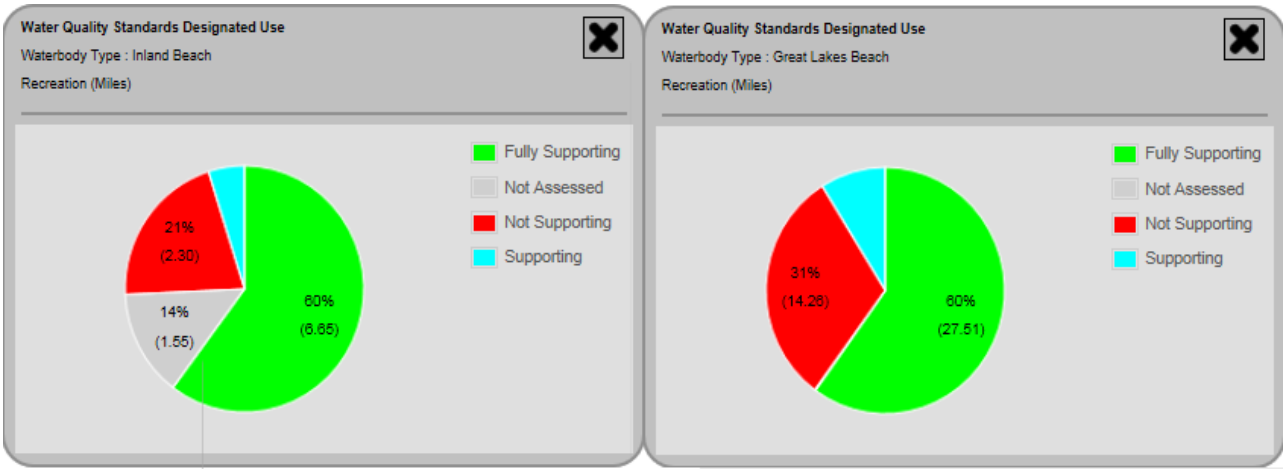


FIGURE 7 BEACH ASSESSMENTS

Great Lakes Shoreline Assessments for Designated Uses

Wisconsin has roughly 1,000 miles of Great Lakes Shoreline, with only a fraction of those shoreline miles considered assessed for Fish and Aquatic Life uses (Table 5). Many of these waters' fish and aquatic life uses are impaired due to sediment contamination from historic discharges or "legacy" pollutants. As staff and fiscal resources allow, WDNR will conduct a more comprehensive assessment of Great Lakes shorelines in the future.

Table 5. Great Lakes shoreline miles assessed and designated use support status.

Assessed Uses	Fully Supporting	Supporting	Not Supporting	Not Assessed	Total Size
Fish and Aquatic Life	0	112	0	856	968
Fish Consumption	0	0	268	700	968

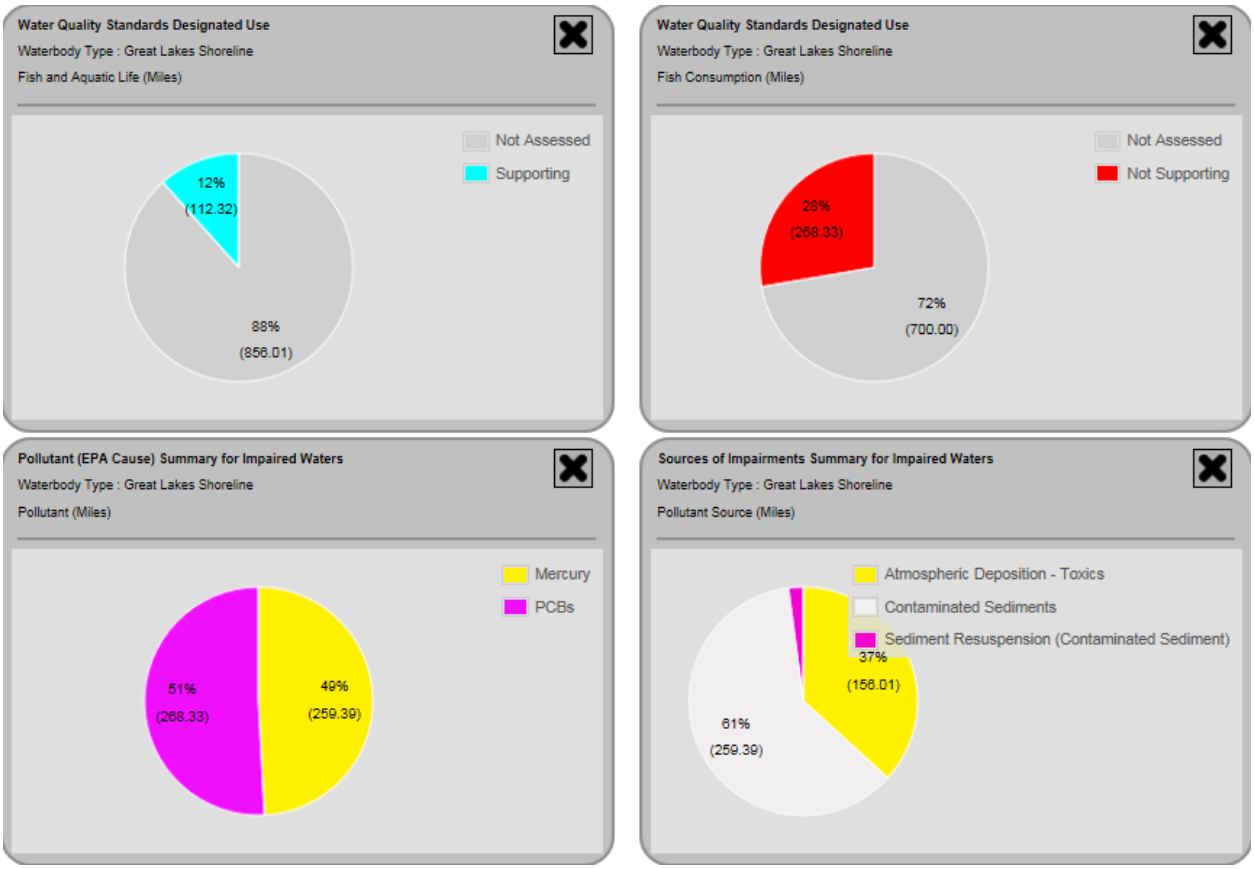


FIGURE 8 GREAT LAKES SHORELINE MILES

Great Lakes shoreline miles are selectively assessed, with major focus on contaminated harbors and bays and other areas included in the Great Lakes Water Quality Agreement's Areas of Concern. As the charts indicate, on Great Lakes Shorelines, fish consumption is the primary designated use that is 'impaired' with mercury and PCBs the primary pollutants stemming from in-place contaminated sediment, atmospheric deposition, or suspension of in-place sediments.

STATEWIDE CONDITION ASSESSMENTS

LAKE TROPHIC STATUS

Wisconsin bases its general condition assessment of lakes on the Carlson Trophic State Index (TSI). The Carlson TSI is the most commonly used index of eutrophication (i.e. primary production via photosynthesis). A TSI value is calculated for each of the following indicators: chlorophyll concentration, Secchi depth and satellite-derived estimates of water clarity data. Because TSI is an indicator of algal biomass, typically the chlorophyll-based TSI value is a better predictor than Secchi depth or satellite data; however, water clarity as measured by Secchi depth or satellite is a practical measure of algal production and water color. Algal production is known to be highly correlated with nutrient levels. High levels of nutrients can lead to eutrophication and blue-green algae blooms. This limits the amount of available light to macrophytes and adversely affects other aquatic organisms. Information from each of these parameters is valuable because the interrelationships between them can be used to identify other environmental factors that may influence algal biomass.

TSI values range from low (less than 30), representing very clear, nutrient-poor lakes, to high (greater than 70) for extremely productive, nutrient-rich lakes. Wisconsin uses a categorization scheme using "natural communities" which provides a more accurate "fit" for TSI values with lake potential – attainable use. Each lake natural community has its own condition thresholds for TSI values. Even with the natural community schematic in place, very few lakes in Wisconsin are naturally "very clear, nutrient poor lakes." The cutoff for excellent TSI values would certainly include these lakes but also includes some lakes in the mesotrophic category, based on sediment core data which indicates that some lakes are naturally more productive than others.

Table 6. Trophic Status of Wisconsin Lakes

Number of Lakes and Trophic Status		**Number of Lake Acres**	
Trophic Status	**# lakes**	**Trophic Status**	**Total Acres**
Eutrophic	2,159	Eutrophic	569,498.9
Hypereutrophic	104	Hypereutrophic	302,21.83
Mesotrophic	3,781	Mesotrophic	311,692.7
Oligotrophic	255	Oligotrophic	67,202.6
Grand Total (Number of Lakes)	6,299	Grand Total	978,616.1

STREAM BIOLOGICAL CONDITIONS

WDNR began a monitoring program in 2010 to assess the condition of wadeable streams across the state using a probabilistic design called the Natural Community Stratified Random (NCSR) monitoring program. The NCSR program design included monitoring at approximately 550 sites over four years that were spatially stratified to cover the entire stream, geographic and land use types found throughout the state. By using a probabilistic design the State was able to use the results to determine the overall the physical, chemical & biological condition of Wisconsin's wadeable, perennial streams.

Biologic assemblages (macroinvertebrates and fish) were assessed using Indices of Biotic Integrity (IBI) that are unique to the assemblage and stream type (i.e. natural community). Based on macroinvertebrate IBI scores, 18% of streams, by length, are in poor condition. Based on fish IBI scores, *32% of streams are estimated to be in poor condition.* These results are comparable to the designated use support assessments that show approximately 13% of all monitored streams (about ½ of all Wisconsin Streams) are not supporting the fish and aquatic life use).

The NCSR study was also used to determine whether a measured stressor, such as a pollutant of concern, is severe enough to cause a significant level of risk to the health of a biological assemblage (e.g. fish or macroinvertebrates). A statistic called *Relative Risk (RR)* was used to measure the increased probability that a biologic assemblage will be in poor condition if the stressor is also in poor condition. ***The results show that the most severe, and statistically significant, stressors to macroinvertebrate condition were elevated total phosphorus concentrations, low dissolved oxygen levels and degraded physical habitat.*** The most severe, and statistically significant, stressors to ***fish condition were found to be degraded physical habitat and low dissolved oxygen levels.***

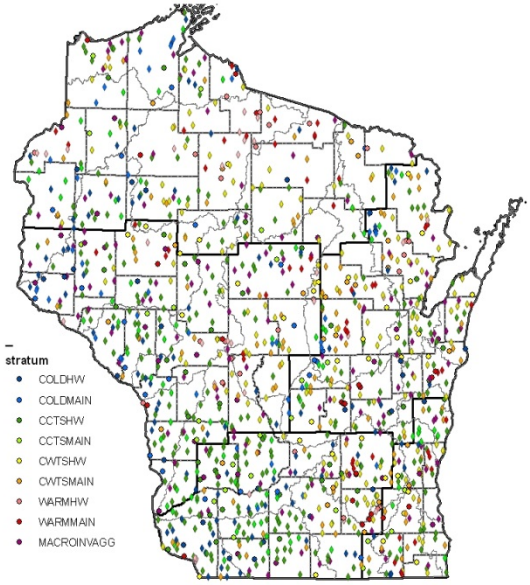


FIGURE 9 NATURAL COMMUNITY SITES 5 YEARS OF SAMPLING

LONG-TERM TREND WATER QUALITY MONITORING

LAKE LONG-TERM TREND (LTT) NETWORK

Sixty-three lakes across the state have been monitored annually for water quality over the long term. One lake has been monitored since 1968, and the majority of lakes have been monitored for at least 20 years. These long-term records allow tracking of water quality changes over time and also provide regional reference conditions for each defined lake class. By characterizing within-lake and among-year variability in water quality, the LTT lakes

provide context for lake assessments elsewhere that are based on a couple of years of data. They also provide an invaluable resource to lake managers who can use this data set to help identify the source of and then hopefully solve water quality problems.

Trend lakes are distributed throughout the state and were selected by both lakes and fisheries staff in each region with at least one lake in each of the defined lake classes. Trend lakes were selected to ensure that these lakes represent the lake class and will, over the long-term, represent trends for the region. Figure X shows the location of the LTT lakes.

Trend lakes are sampled annually for water quality during spring turnover and three times during summer (15 July - 15 September) for water quality. Total phosphorus, Secchi depth, chlorophyll a and field vertical profiles of dissolved oxygen, temperature, pH and conductance compose the core indicators collected each sampling date (except chlorophyll a in spring). Other supplemental water quality parameters collected once each summer may include conductivity, alkalinity, color, and, on specified lakes, nitrate, nitrite, and total Kjeldahl nitrogen. Calcium and magnesium are sampled every 5 years on selected lakes.

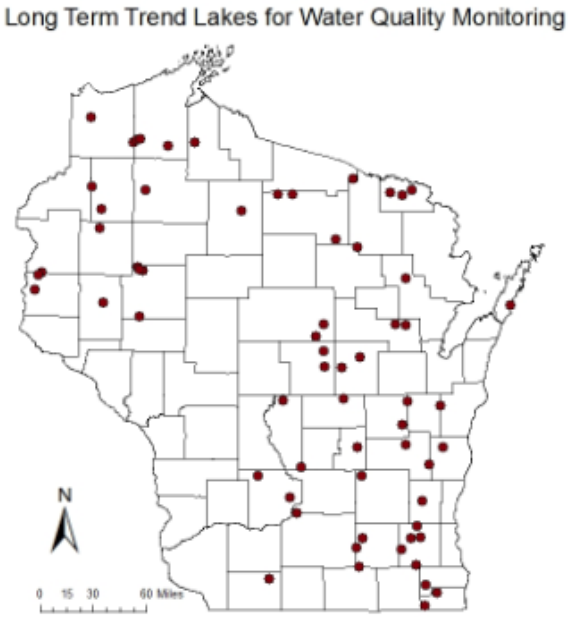


FIGURE 10 LONG-TERM LAKES MONITORING

RIVER LONG-TERM TREND (LTT) NETWORK

The current LTT river water quality monitoring network, rejuvenated in 2001, consists of 42 sites, with a minimum of one site per major river basin, generally located near the mouth of each river. Most of these sites were part of an earlier trend monitoring program with data available from as far back as the 1970s. Selection of the 42 trend monitoring sites considered different land coverage in the state varying from urban areas in the southeast, heavy agricultural use in central and southwest and forest cover dominating in the north. Just over half the sites (24) are sampled monthly and the other sites are sampled quarterly. Monthly sites are generally located near the mouth of major rivers, whereas, quarterly sites are often located at additional sites on major rivers some distance above the mouth. Water quality samples are analyzed for nutrients, solids, specific conductance, pH, hardness, alkalinity, bacteria, chlorophyll, and biannually for triazine herbicides following approved U.S. EPA

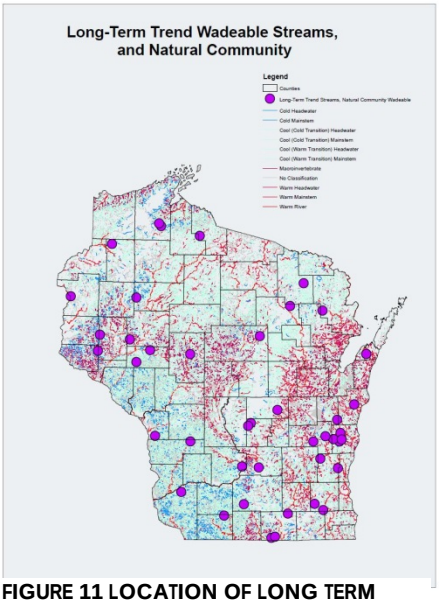


FIGURE 11 LOCATION OF LONG TERM TREND WADEABLE STREAM SITES. STREAMS ARE COLORED TO REPRESENT NATURAL COMMUNITY TYPES

methods. Low level metal sampling using "clean hands" techniques is conducted quarterly at a subset of the monthly monitoring sites and biannual sampling of triazine is done during winter and summer periods.

Water quality trends in the state have been both positive and negative over the last 20 years. Phosphorus, ammonia and suspended solids (sediment) concentrations have decreased at a majority of long-term trend river monitoring stations. This is probably due to a combination of decreases in wastewater effluent concentrations, improved farming practices, construction site erosion control, and urban stormwater management. Nitrate concentrations have increased at a majority of long-term trend river monitoring stations, which is likely due to increased nitrogen fertilizer use on crop fields, and may reflect increased corn production due to high corn prices.

Nitrate levels in surface water are rising, but are not yet at levels where they would make water unsafe to drink (note that these data do not pertain to groundwater, public or private well data). Better nutrient management on farms would reduce this trend. Chloride concentrations have increased at a majority of long-term trend river monitoring stations. This is probably due to increased road salt use during the winter. Use of new application methods and ice melting products could help stop this trend.

INTEGRATED REPORT FIVE-PART CATEGORIZATION

With the Integrated Report option, US EPA encourages States/Tribes to use a five-category system for classifying all water bodies (or segments) within its boundaries regarding the waters' status in meeting the State's/Tribe's water quality standards (Table 7). The classification system is based on designated uses for reporting on water quality. Each waterbody and designated use combination is assigned a reporting category.

Table 7. USEPA Integrated reporting categories.

Category/Subcategory	Description
Category 1	All designated uses are supported, no use is threatened.
Category 2	Available data and/or information indicate that some, but not all, designated uses are supported.
Category 3	There is insufficient available data and/or information to make a use support determination.
Category 4	Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed.
Subcategory 4a	A State developed TMDL has been approved by EPA or a TMDL has been established by EPA for any segment-pollutant combination.
Subcategory 4b	Other required control measures are expected to result in the attainment of an applicable water quality standard in a reasonable period of time.
Subcategory 4c	The non-attainment of any applicable water quality standard for the segment is the result of pollution and is not caused by a pollutant.
Category 5	Available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed.

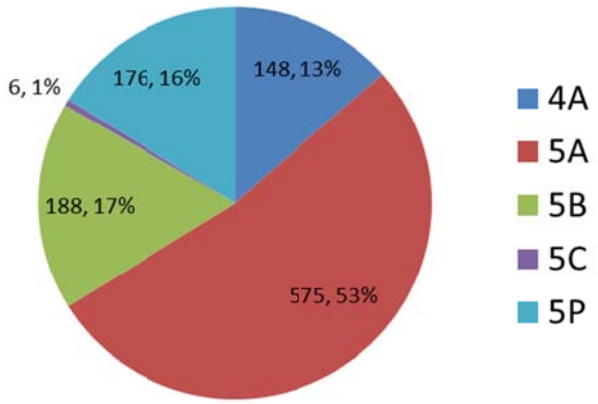
Source: http://water.epa.gov/learn/training/standardsacademy/page7.cfm

WDNR has further refined subcategories. Category 5 (waters not meeting water quality standards and a TMDL is needed), subcategories distinguish among differing types of impaired waters and TMDL priorities. WDNR created 5B to identify waters impaired by mercury mainly from atmospheric sources. Within the last two assessment periods, WDNR has added additional subcategories under Category 5. These additional subcategories are defined in Table 8.

Table 8 WDNR's Integrated Reporting subcategories for impaired waters requiring TMDLs.

Subcategory	Definition
Category 5A	Available information indicates that at least one designated use is not met or is threatened and/or the anti-degradation policy is not supported, and one or more TMDLs are still needed. This is the default category for impaired waters.
Category 5B	Available information indicates that atmospheric deposition of mercury has caused the impairment and no other sources have been identified.
Category 5C	Available information indicates that non-attainment of water quality standards may be caused by naturally occurring or irreversible human-induced conditions.
Category 5P	Available information indicates that the applicable total phosphorus criteria are exceeded; however, biological impairment has not been demonstrated (either because bioassessment shows no impairment or because bioassessment data are not available).
Category 5W	Available information indicates that water quality standards are not met; however, the development of a TMDL for the pollutant of concern is a low priority because the impaired water is included in a watershed area addressed by at least one of the following WDNR-approved watershed plans: adaptive management plan, adaptive management pilot project, lake management plan, or Clean Water Act Section 319-funded watershed plan (i.e. nine key elements plan).

Of the 6,169 waters assessed for impairment in 2014, 1,093 (18%) were found to not meet water quality standards and are included on the CWA Section 303(d) list (i.e., impaired waters list). Of the state's impaired waters, 148 (13%) have EPA-approved TMDLs (Category 4A). For those impaired waters still requiring TMDLS, six waters are categorized as impaired due to suspected naturally occurring sources of pollution (Category 5C), 188 (17%) are impaired due to atmospheric deposition of mercury only (Category 5B), 176 (16%) are impaired due to levels of phosphorus only (5P),



and 575 (53%) waters are impaired due to other causes (5A) (Figure 12).

CWA Section 303(d) List (Impaired Waters)

Assessing waterbodies against water quality standards and identifying impaired waters that don't meet standards is part of the overarching federal Clean Water Act (CWA) framework for restoring impaired waters. Waters that do not meet their designated uses because of water quality standard violations are impaired. Waterbodies are removed from the list when new data indicates that water quality standards are attained.

The 2014 impaired waters list contains more than 1,400 pollutant/water listing combinations. The primary pollutant listings are total phosphorus, total suspended solids (sediment), and mercury, representing 75% of the current listings (Figure 13).

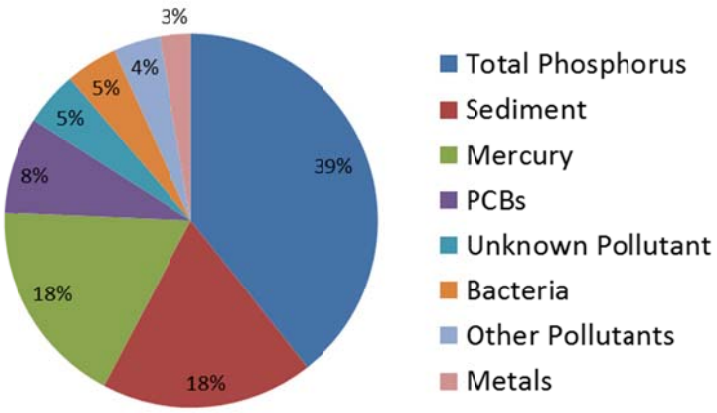


Figure 13 illustrates causes of impairment (or pollutants) for waters included on Wisconsin's 2014 CWA Section 303(d) list of waters not meeting water quality standards. "Unknown Pollutant" listings are biological or physical habitat impairments where the pollutant is not known.

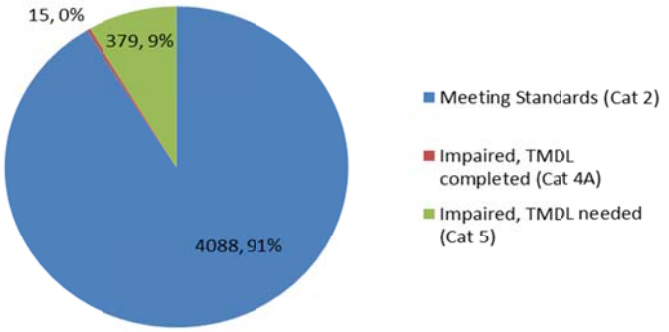
A total of 301 pollutant/waterbody segment combinations (i.e. listings) are newly proposed for the list, of which 251 are for waterbody segments that have never been listed before. A majority of the new listings are based on exceedance of the total phosphorus criteria (n=225). A total of 56 listings are based on poor biological condition with unknown causes (i.e. pollutants).

The number of whole waterbodies being listed is 248 and while some of these waters had been listed previously for other impairments, 187 of these waters are newly listed. There are 20 listings, 10 whole waterbodies, proposed to be removed during the 2014 updates.

Impaired waters listings provide impetus for completing watershed restoration studies. Federal and state cost-share grants may be available to landowners for projects that address nonpoint sources of pollution, and some grants provide incentives for restoration of impaired waters. For certain grants, applicants with projects that help restore impaired waters have a greater chance of receiving funding, including the USDA's Environmental Quality Incentives Program (EQIP), Targeted Runoff Management (TRM) grants, and EPA Section 319 Grant (funded projects must reduce pollutant(s) to an impaired water).

INTEGRATED REPORTING SUMMARIES BY WATERBODY TYPE GROUPINGS

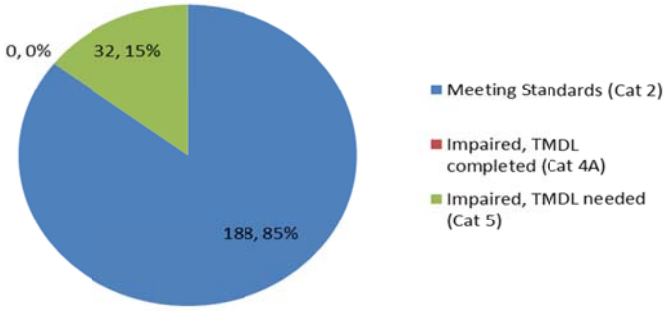
LAKES, IMPOUNDMENTS, BAYS AND HARBORS



, BAYS AND

Of the 4,482 assessed lakes, impoundments, bays and harbors, 4,088 (91%) were found to be supporting all assessed designated uses (Category 2). Of the remaining 394 waters that were not supporting at least one designated use, 379 still require TMDLs (Category 5) and 15 are addressed by EPA-approved Total Maximum Daily Load (TMDL) studies (Category 4). Roughly half (49%) of those impairments still requiring TMDLs are due to atmospheric deposition of mercury (Category 5B).

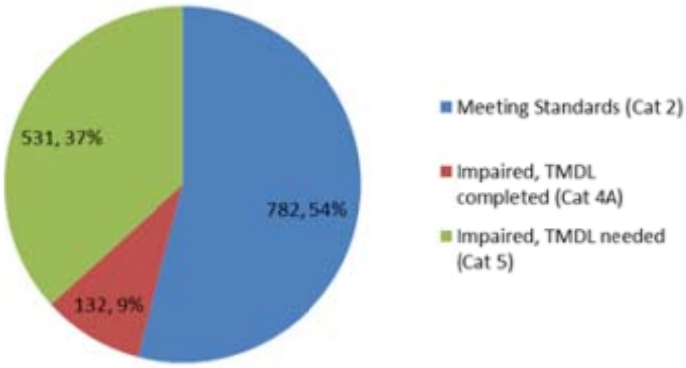
BEACHES AND GREAT LAKES SHORELINE WATERS



GREAT LAKES

Of the 220 assessed beaches and Great Lakes shoreline waters, 188 were found to be supporting all assessed designated uses (Category 2). The remaining 32 waters were not supporting at least one designated use (Figure 15). TMDLs have not been developed for beaches for Great Lakes shoreline waters.

RIVERS AND STREAMS



Of the 1,445 assessed river and stream segments, 782 (54%) were found to be supporting all assessed designated uses (Category 2). Of the remaining 663 waters that were not supporting at least one designated use, 531 still require TMDLs (Category 5) and 132 are addressed by EPA-approved Total Maximum Daily Load (TMDL) studies (Category 4) (Figure17).

RESTORATION OF WISCONSIN'S WATERS

Several types of management actions are used to restore waters. Wisconsin's Total Maximum Daily Load (TMDL) Program and Nine-Key Element Planning Program (particularly for waters with runoff dominated issues) are just two of the tools used to restore waters back to standards attainment.

TMDLS IN DEVELOPMENT

WISCONSIN RIVER TMDL

WISCONSIN TMDL WEBSITE

The Wisconsin River TMDL study area spans Wisconsin's central corridor from the river's in Vilas County to Lake Wisconsin in Columbia County, covering 9,156 mi^2 – approximately 15 percent of the state. The project area also encompasses:

- More than 110 wastewater dischargers
- 2nd & 5th largest inland lakes in Wisconsin
- 4 reaches impaired for suspended solids
- 16 reaches impaired for phosphorus
- 85 Cities and Villages
- 25 major tributaries
- 21 Counties

TMDL Monitoring for the Rock River TMDL is now complete and modeling will soon begin to identify pollutant load allocations and strategic plans for future work in this large, influential portion of Wisconsin. Read more at the Rock River TMDL Website.

MILWAUKEE RIVER BASIN TMDL

A draft TMDL report and preliminary TMDL allocation information was delivered to WDNR on December 31, 2013 for WDNR internal review. The WDNR draft included preliminary load allocation information for the Kinnickinnic and Menomonee River watersheds, as well as for the Milwaukee Harbor Estuary. Functionality issues with the existing Water Quality Initiative (WQI) models have caused a delay in developing preliminary allocation information for the Milwaukee River watershed. The source of the issues has been determined and the TMDL Development Team is currently resolving them to produce the Milwaukee River watershed allocations for WDNR review.

> The Milwaukee Metropolitan Sewerage District maintains a website for the Milwaukee TMDL http://mmsd.com/waterquality/total-maximum-daily-loads

After WDNR's internal review, revisions to the draft report will be made, and required adjustments to the preliminary load allocations will be performed. Any adjustments to the allocations will be to ensure consistency with other Wisconsin TMDLs. At that time, the allocations and supporting documentation will be made available on MMSD's TMDL webpage (http://v3.mmsd.com/Report.aspx) for stakeholder review. The TMDL allocations will then be presented and discussed at a stakeholder workshop planned for late spring / early summer - the meeting date and details for that workshop will also be provided in our communications.

After the stakeholder workshop to present the allocations, next steps include WDNR holding additional focused stakeholder workshops and public information sessions, providing an official public notice, delivering the final TMDL report submittal to USEPA for review and approval, and developing an implementation plan. Implementation plan completion is scheduled for December 31, 2014 and TMDL stakeholders will be invited to additional stakeholder meetings that will be part of the implementation plan development process.

APPROVED TMDLS

THE ROCK RIVER TMDL

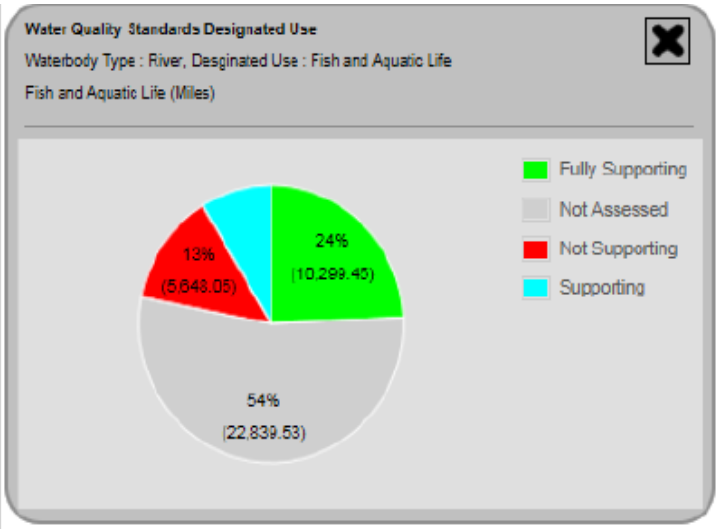
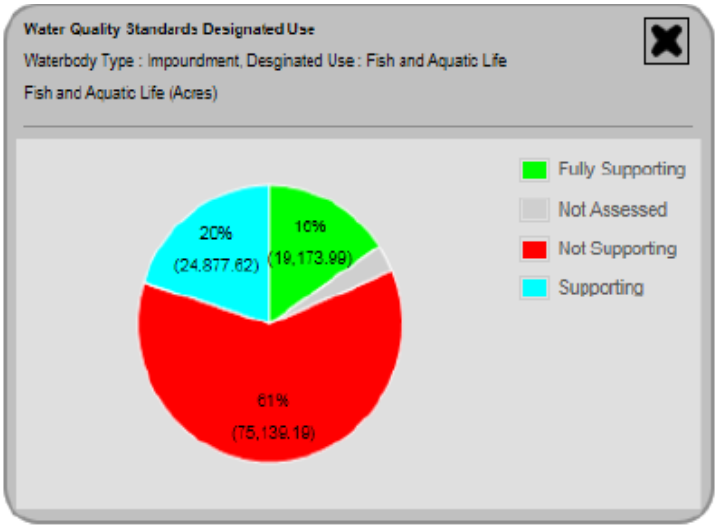
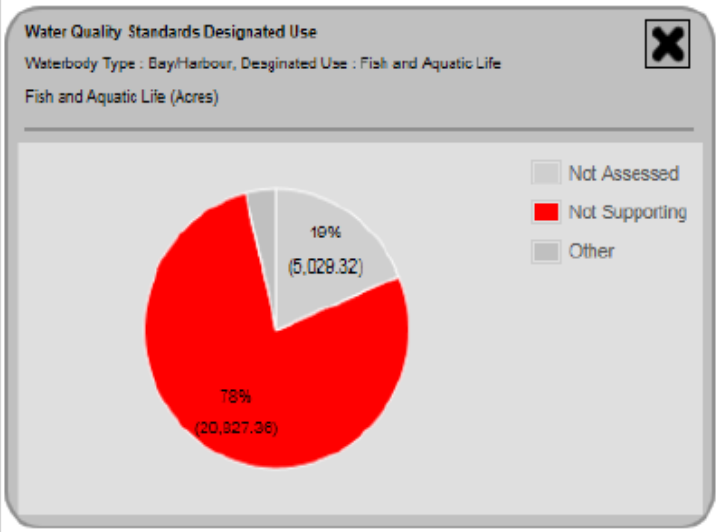
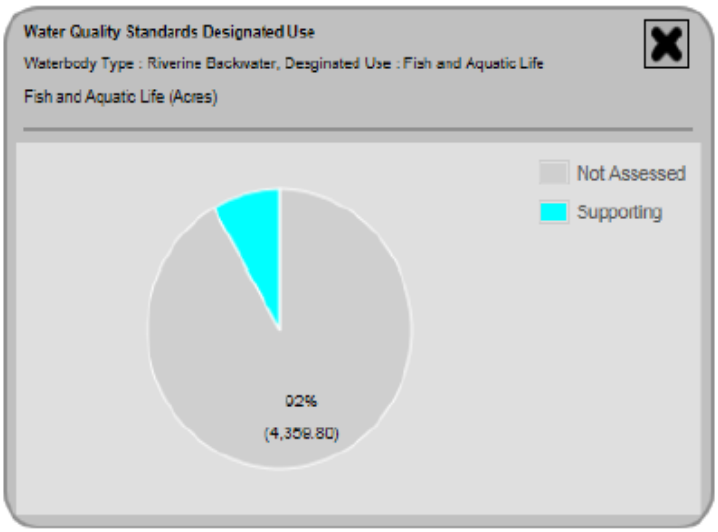
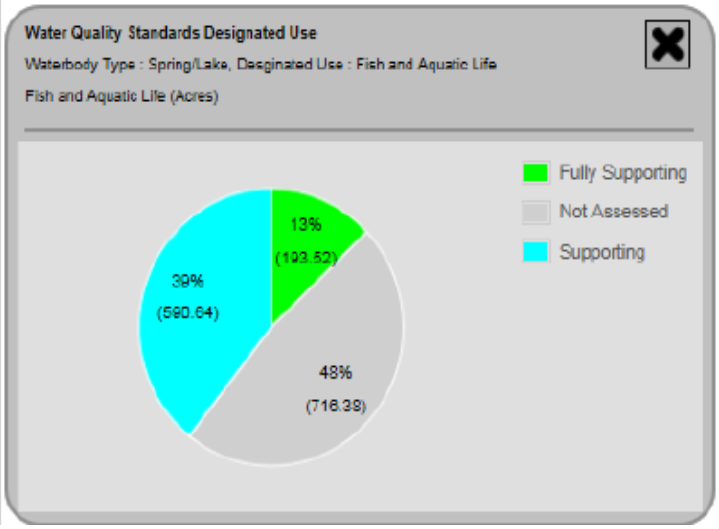
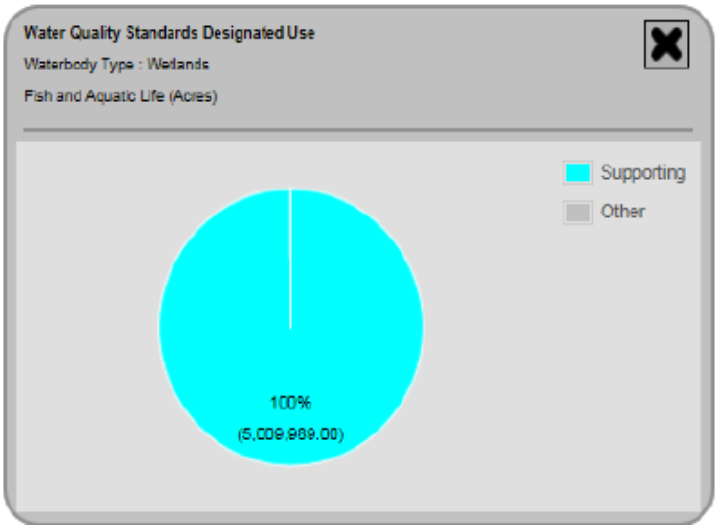
ROCK RIVER TMDL

The Yahara WINS Pilot Project is testing a new, innovative and collaborative compliance approach called Watershed Adaptive Management in order to meet regulatory requirements for phosphorus reduction in the Yahara Watershed in a cost-effective manner. Over thirty entities are participating in the pilot project, including wastewater treatment plants, industry, cities, villages, towns and numerous other partners. 2013 was the first, complete year for the pilot project. During 2013, Yahara WINs funded research, water quality monitoring, installation of phosphorus reducing practices, baseline inventories of agricultural land and other initiatives. By its completion in 2015, the pilot project will provide the data needed to help Yahara WINs participants make informed decisions relating to the use of adaptive management to meet the Rock River TMDL reduction requirements related to phosphorus and total suspended sediment. Read more about the Yahara WINs project.

LAKE ST. CROIX TMDL

LAKE ST. CROIX TMDL WEBSITE MN || WI SITE

The St. Croix River and Lake St. Croix are highly valued resources that provide exceptional recreational opportunities and support a highly diverse ecology of aquatic and terrestrial species. However, over the years eutrophication, or nutrient enrichment, has occurred in Lake St. Croix due to excess phosphorus loading. This loading drives nuisance algae blooms which diminish the enjoyment and use of the lake. This report represents an important step in the improvement of Lake St. Croix by focusing on establishing the needed reduction in the loading of phosphorus from its contributing basin in order to achieve water quality standards. The St. Croix River basin (XFigure 1X) represents a large area—approximately 7,760 square miles—with 44 percent of the basin land area (excluding water and wetlands) located within Minnesota and 56 percent within Wisconsin. It includes portions of both the Northern Lakes and Forests (NLF) and North Central Hardwood Forests (NCHF) ecoregions. The St. Croix River originates near Solon Springs, Wisconsin, and flows west and south more than 160 miles until it joins the Mississippi River at Prescott, Wisconsin. Lake St. Croix is a naturally impounded riverine lake in the lower 25 miles of the St. Croix River.

FIGURE 17 LAKE ST. CROIX

APPENDIX A: Graphs of Designated Uses