January 1, 2012 –

December 31, 2012

WISCONSIN
DEPT. OF NATURAL RESOURCES

BUREAU OF WATER QUALITY

2012 Water Quality Highlights

2012—A Year in Review

As we predicted in 2010, a record number of retirements in 2011created 93 vacancies in the Watershed Management/Water Quality Programs. One of my highest priorities as Bureau Director in 2012 was to rebuild our workforce.

Our DNR Secretary Stepp and Governor Walker understood how necessary the DNR's water quality program activities are to Wisconsin citizens and approved these vacancies as critical fills. To date, 72 FTE vacancies have been staffed.

With so many younger faces amongst us, we launched a training program for new hires in the Water Quality, Watershed Management and Office of the Great Lakes Programs. One of the goals of the training was to help new FTE/Project employees learn how our combined efforts and collaboration help us achieve common goals. The next generation of Water Quality staff will contribute innovative ideas for developing and implementing our ever-evolving programs and policies.

These 2012 highlights demonstrate the importance of our work. As we continue to celebrate the 40th Anniversary of the federal Clean Water Act, we can all take pride in our accomplishments in improving Wisconsin's water quality for present and future generations. Our work is truly a partnership with the citizens of Wisconsin and each other.

Susan Sylvester, **Director of Water Quality**

DNR Photo: Willow Flowage.

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Water Resources and the Water Quality Program

DNR Photo: A UW-Stout student collects a chloride / conductivity sample for a road salt impact study.

Managing, protecting and restoring Wisconsin's water resources contribute to the state's environmental quality and economic success. Our 15,081 lakes and 12,600 rivers and streams help fuel Wisconsin's $13 billion tourism industry.

The DNR's Water Quality staff work hard to focus program efforts on meeting water quality goals and protecting recreational uses for generations to come. Staff collect water quality data, make decisions based on science, track and document progress in restoring impaired waters, and educate the public about water quality and associated human health issues.

Data collected and evaluated is stored in the SWIMS and/or WATERS databases. The Water Quality Program continually evaluates the state of our precious water resources and where additional actions are needed to maintain and enhance our waters. We also develop strategies and partnerships to protect our outstanding and exceptional water resources.

We engage the public and external partners to help us monitor our waters; prevent pollution; manage our lakes, rivers and streams; and prevent the spread of invasive species. Our GIS-based interactive mapping web tool, the Surface Water Data Viewer , provides public access to a wealth of information collected on the status of our water resources.

Monitoring, Planning and Research Success Stories

A reorganization within the Bureau of Water Quality created a new monitoring section. Tim Asplund was hired as the Monitoring Section Chief in July 2012. These are some of the highlights of monitoring and water quality planning accomplishments around the state.

DNR Monitoring

- 108 stream sites were monitored for fish, macroinvertebrates, qualitative habitat, temperature, pH, dissolved oxygen, conductivity, and total phosphorus samples as part of the Natural Community Stratified Random Sampling Project.
- 102 severely-impacted stream sites were monitored for fish, macroinvertebrates, qualitative habitat, temperature, pH, dissolved oxygen, conductivity, and total phosphorus samples.
- Monthly samples at 24 non-wadeable rivers sites, and quarterly samples at an additional 18 sites, were collected for water chemistry analyses including nutrients, solids, chlorophyll *a*, and some metals.

Citizen Monitoring Program

- 915 citizens monitored 680 lakes at 861 stations.
- 380 citizens monitored 507 stream stations.
- DNR staff completed uploading over 260 thermistors' (temperature) data to SWIMS, assessing data quality within the database, and updating all 860+ station site names to follow the same naming convention.
- Trainings conducted by the Citizen Stream Monitoring Program introduced about 340 volunteers to the basics of monitoring; waterbody types and their connection with land use; and water quality issues.
- Volunteers collected chloride and conductivity readings in seven areas, including four universities, through the Citizen Stream Monitoring Program. The UW-Eau Claire Geology program was awarded a grant to expand their monitoring study of chloride impacts on groundwater.
- Middle school and high school students at The Prairie School in Racine worked with a DNR biologist to collect total phosphorus samples in a nearby stream. Students used Level 2 monitoring protocols and submitted samples to the State Laboratory of Hygiene for analysis. An outreach campaign was launched to educate the community about preventing over-fertilizing of lawns. Prairie School teachers received an award for their efforts at the Volunteer Stream Monitoring Symposium.

Watershed Planning and Research

- Staff conducted data pulls from SWIMS and WATERS assessments and drafted watershed report write-ups for 13 watersheds now on the DNR website.
- Mississippi River Monitoring Team staff presented a paper on their research, "Causes and Consequences of Abundant Duckweed and Filamentous Algae in Backwater Lakes of the Upper Mississippi River Near La Crosse, Wisconsin," at the Mississippi River Research Consortium in April 2012, at La Crosse, WI.

Water Evaluation and Assessment Success Stories

Every two years, Water Evaluation staff prepare a "Report to Congress" on the state of our waters using information in the SWIMS and WATERS Databases. The 2012 report includes a list of waters considered impaired under Clean Water Act Section 303(d). Impaired waters do not meet water quality standards and may not support fishing, swimming, recreating, or public health and welfare.

Improvements to impaired waters are addressed through the development of a Total Maximum Daily Load (TMDL). A TMDL is the amount of a pollutant a waterbody can receive and still meet water quality standards. It is a pollution "budget" for a water body or watershed that establishes the pollutant reduction needed from each pollutant source to meet water quality goals.

Only a small fraction of Wisconsin's surface waters are listed as impaired: approximately 700 rivers, streams and lakes out of the state's 15,081 lakes and 84,000 stream miles. The 2012 Impaired Waters List added 32 waters primarily for mercury, total phosphorus and/or total suspended solids levels. The list proposed removal of 25 waters because they now meet water quality standards.

These are some of the highlights of accomplishments in water evaluation and assessment.

Data Assessment Improvements

- DNR staff developed a Watershed Assessment, Restoration and Protection (WARP) framework to integrate water quality monitoring priorities; impaired water data assessment; TMDL development and implementation; permit issuance coordination; and communication activities with staff resources.
- Several staff received Special Mention in the Dream Team category of the DNR's "Pride Awards" for the development of a Pollutant Load Ratio Estimation Tool – a statewide GIS-based tool that compares the average annual phosphorus loads originating from point and nonpoint sources within a watershed.
- A total of 1,833 waters were assessed for the 2012 Report to Congress. The assessment process included methods for analyzing lakes, rivers, and stream data based upon new administrative rules containing phosphorus water quality criteria.

Photo: High sediment loads from the Fox River into Green Bay — April 2011, Steve Seilo.

Total Maximum Daily Load Projects

- The Lower Fox TMDL was approved by EPA on May 12, 2012. There are 14 impaired waters in the Lower Fox River Basin, including Lower Green Bay, that are polluted by excess phosphorus (TP) and total suspended solids (TSS). These pollutants reach rivers and streams from polluted runoff from farm fields, barnyards, residential yards and industrial and municipal wastewater treatment plants. Phosphorus and sediment impair fish and aquatic life uses. DNR staff have been working with stakeholders to address nonpoint sources of phosphorus stemming from manure spreading.
- The Upper Fox/Wolf Basins TMDL monitoring is in its final year of monitoring. This project includes sampling 13 rivers and lakes throughout the Upper Fox and Wolf basins at varying frequencies during the year. The data will be used to help calibrate and validate a pollutant loading model for agricultural and rural areas.
- A DNR project manager was hired to oversee the development of the TMDL for the Upper Fox/Wolf, and to assist in implementation of the approved Lower Fox TMDL. A project manager was also hired to oversee the development of a TMDL for the Wisconsin River.

Team members Kevin Kirsch, Theresa Nelson, Trip Hook and Adam Freihoefer receive Special Mention in the DNR's Dream Team Pride Award competition from Deputy Secretary, Matt Moroney, for developing a Pollutant Load Ratio Estimation Tool (PRESTO) within one year.

Lakes and Rivers Success Stories

The DNR partners with the University of Wisconsin Extension and citizens around the state to help protect and maintain our lakes and rivers. Wisconsin's water resources provide some of the best recreational opportunities in the nation. More than 600 lake organizations and thousands of volunteers play a leadership role in the stewardship of Wisconsin's water resources.

Key accomplishments in the Lakes and Rivers Program were:

Read about the ongoing Delavan Lake restoration efforts and associated economic benefits in the April 2012 issue of the Natural Resources Magazine.

DNR Photo: Delavan Lake Inlet.

Web Page and Database Upgrades

- The DNR Lakes web homepage was redesigned and the Lakes web pages continue to grow both in content and popularity — with over 23,000 hits during the month of June 2012. Local lake organizations links were incorporated on the Lakes web pages with a link to the UW Extension Lakes web page.
- Over 150 fish survey reports and aquatic plant survey reports written by DNR biologists were tagged with a river, stream, or lake Waterbody ID Code. These were uploaded into the SWIMS database and are now available to the public on the Lakes web pages.
- A list of key data elements, products, or deliverables associated with lake planning and protection grants was compiled and defined. These are the elements that will be tracked in the SWIMS database or the Community Assistance Operation System (grant data base) to evaluate grant program performance.
- Planning and testing was completed to input lake aquatic plant data and surveys in the SWIMS database and expand the Citizen Lake Monitoring Network Program to begin tracking lake levels. Entry screen improvements were made to simplify data entry and are currently being tested.
- Data entry forms were set up for reporting Aquatic Invasive Species (AIS) Program efforts including: the Clean Boats, Clean Waters Program; AIS Early Detection / DNR Random AIS Monitoring; Wetlands Monitoring; and the Boat Landing Observation protocol and group checks.
- Staff completed a streamling project to reduce the amount of time volunteers spend completing applications for Clean Boats, Clean Waters AIS grants, documenting time contributions, and developing final project reports.

$3,557,271 in grants were awarded in 2012 to local communities for aquatic invasive species prevention and control.

Training and Outreach

- Annual spring AIS Monitoring Training and SWIMS Database Training courses were held; one each for new trainers and one each as a refresher. Over 100 new volunteers joined the program in 2012.
- The 34th annual Wisconsin Lakes Convention was held in Green Bay in April 2012. Over 450 attendees united to celebrate and protect Wisconsin's legacy of lakes under the convention theme, "Partnering for Lakes." The convention offered workshops, a poster session, and over 35 concurrent sessions.
- Staff prepared the 2012 Report to the Legislature on the Invasive Species Program.

Lake Restoration

Spring turnover and growing season monitoring was conducted in 2012 on East Alaska Lake, Kewaunee County, following the 2011 October alum treatment. Phosphorus values at the bottom profile were an order of magnitude lower, and the average summer secchi depth increased from 8 to 9.45 feet. The average summer chlorophyll *a* level decreased from 12 to 7.5 ug/l , and total phosphorus decreased from 37 to 14.5 ug/l. A local resident reported in summer 2012, that she observed people swimming in East Alaska Lake "...for the first time in a very long time."

Special Recognition

Jeff Bode, Chief of the Lakes and Rivers Section, was the recipient of the DNR's 2012 Rebecca Wallace Memorial Award presented by her son Spencer Wallace. Bode received the award in recognition of his skills and achievements in building relationships with external partners and organizations, and mentoring DNR staff.

Wisconsin Pollutant Discharge Elimination System (WPDES) Permit Program Success Stories

The cornerstone of water quality protection in the federal Clean Water Act is controlling pollutants in wastewater discharges. Wisconsin Pollutant Discharge Elimination System (WPDES) Permits help control the types and amounts of pollutants discharged into the state's waters and applied to the land. Proper treatment and control of wastewater, septage and biosolids are critical in protecting public health, and maintaining the quality of our surface waters and groundwater.

One of Wisconsin's most ubiquitous pollutants is phosphorus. Small increases in phosphorus to our surface waters can fuel substantial increases in aquatic plant growth, algae blooms that can contain toxins, and nuisance algae such as Cladophora and duckweed. Increased plant growth causes decreased levels of oxygen, which is vital for supporting a healthy fishery and aquatic ecosystem. All of these impairments to our surface waters can reduce recreational use, property values, and create a risk to public health.

The DNR has taken important steps in recent years to curb phosphorus loadings to our surface waters. Wisconsin was one of the first states in the Nation to adopt rules in 2010 requiring numeric phosphorus water quality criteria for all lakes, streams, and rivers. Implementing these new rules in WPDES permits has required the development of additional guidance and staff training during 2012.

Phosphorus Rule Implementation

- Several guidance documents were developed and/or enhanced to help reissue permits and implement the new phosphorus standards: Phosphorus Implementation Guidance, TMDL Implementation Guidance, the Adaptive Management Handbook, and Water Quality Trading Guidance.
- Staff improved website functions and developed outreach and education material for externals such as the phosphorus implementation webinar series, the adaptive management factsheet, and the water quality trading framework.
- Permit staff calculated TP and TSS limits for point sources within the Lower Fox TMDL area and issued the first WPDES permits reflecting TMDL allocations (see page 3).

WPDES Permits Fast Facts:

647 municipal wastewater system permits

356 industrial wastewater system permits

23 types of general permits

DNR Photo: Berlin Wastewater Treatment Clarifier.

General Permits

- Staff conferred permit coverage for ballast water discharges to 69 Great Lakes vessels. Staff worked with a DNR legal team on 3 contested cases where state permit and water quality certification were contested by environmental organizations and shipping companies. A decision by a state administrative law judge in November 2012 allowed Wisconsin to move ahead to amend its general water quality permit for ballast water discharges for 300 vessels.
- Six general permits were revised and reissued in 2012: land application of sludge; land application of wastewater; landspreading of by-product solids; contaminated groundwater and remedial actions; petroleum product contact water; and pit-trench dewatering.
- Staff developed and issued new pesticide-related permits due to changed interpretation of federal regulations and laws. The DNR fast-tracked these permits so that EPA and the state would be in compliance with their implementation requirements.

Inspections

- Staff performed over 70 ballast water inspections
- Program staff completed 208 permitted-facility compliance inspections, and 89 laboratory audits to ensure data quality.
- Record rainfall May-June 2012 in northern Wisconsin resulted in flooding and discharges of untreated wastewater into Lake Superior. District staff completed inspections of wastewater treatment facilities and conducted multiple meetings with WPDES permittees to identify long-term solutions for preventing these types of wastewater discharges in the future.

Rule Revisions and Technical Reviews

- Staff developed administrative rule revisions related to Sanitary Sewer Overflows (SSOs). The rules were adopted by the Natural Resources Board at its December 2012 meeting. A significant requirement of the revisions is that all sewage collection system owners must develop and operate a capacity, management, operation and maintenance (CMOM) program as prescribed in the rules. On-going and routine maintenance and management of sewage collection systems extend their operational life and reduce the number of SSO occurrences.
- Staff reviewed over 500 submittals of plans and specifications for wastewater treatment plant upgrades, sewer extensions and other wastewater treatment systems.

The Bureau of Water Quality Program at a Glance

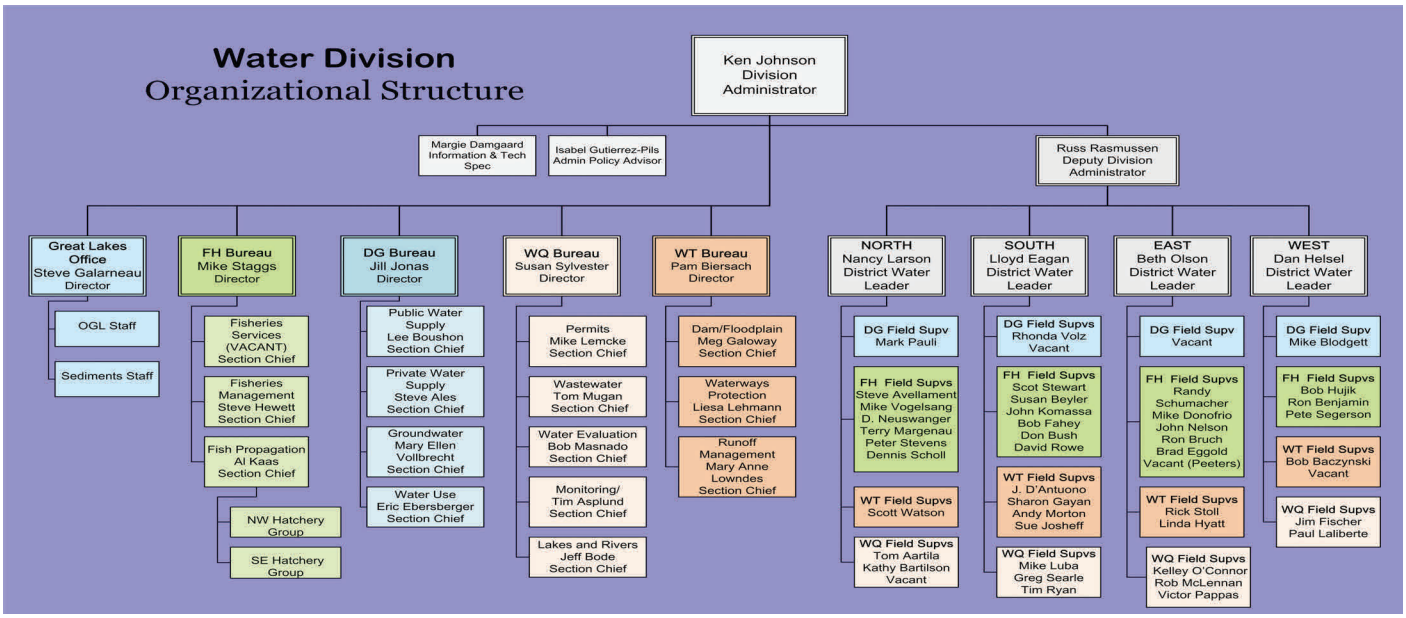
Bureau Description

The Bureau of Water Quality provides science-based monitoring, analysis, and regulation of discharges to waters of the state to protect and maintain the water quality in Wisconsin. It uses integrated management actions including:

- *Strategic water quality monitoring*
- *Citizen monitoring training and support*
- *Watershed planning*
- *Water data management, evaluation, and analysis*
- *Water quality standards development*
- *Pollutant loading analysis and TMDL development*
- *Lakes partnerships coordination and education*
- *Lake planning and restoration grants*
- *Aquatic plant management*
- *Aquatic invasive species monitoring and grants*
- *Municipal / industrial wastewater sewerage system technical reviews and approvals*
- *Permit effluent limits calculations*
- *WPDES permit issuance and compliance monitoring*
- *Wastewater treatment plant operator outreach and education*

DNR Photo: Lake Tomahawk.

Mission Statement

Our mission is to provide clean, safe water and the highest quality protection and treatment of water for the citizens of Wisconsin, by adhering to state and federal requirements for water quality and environmental protection.

Water Division Organizational Structure