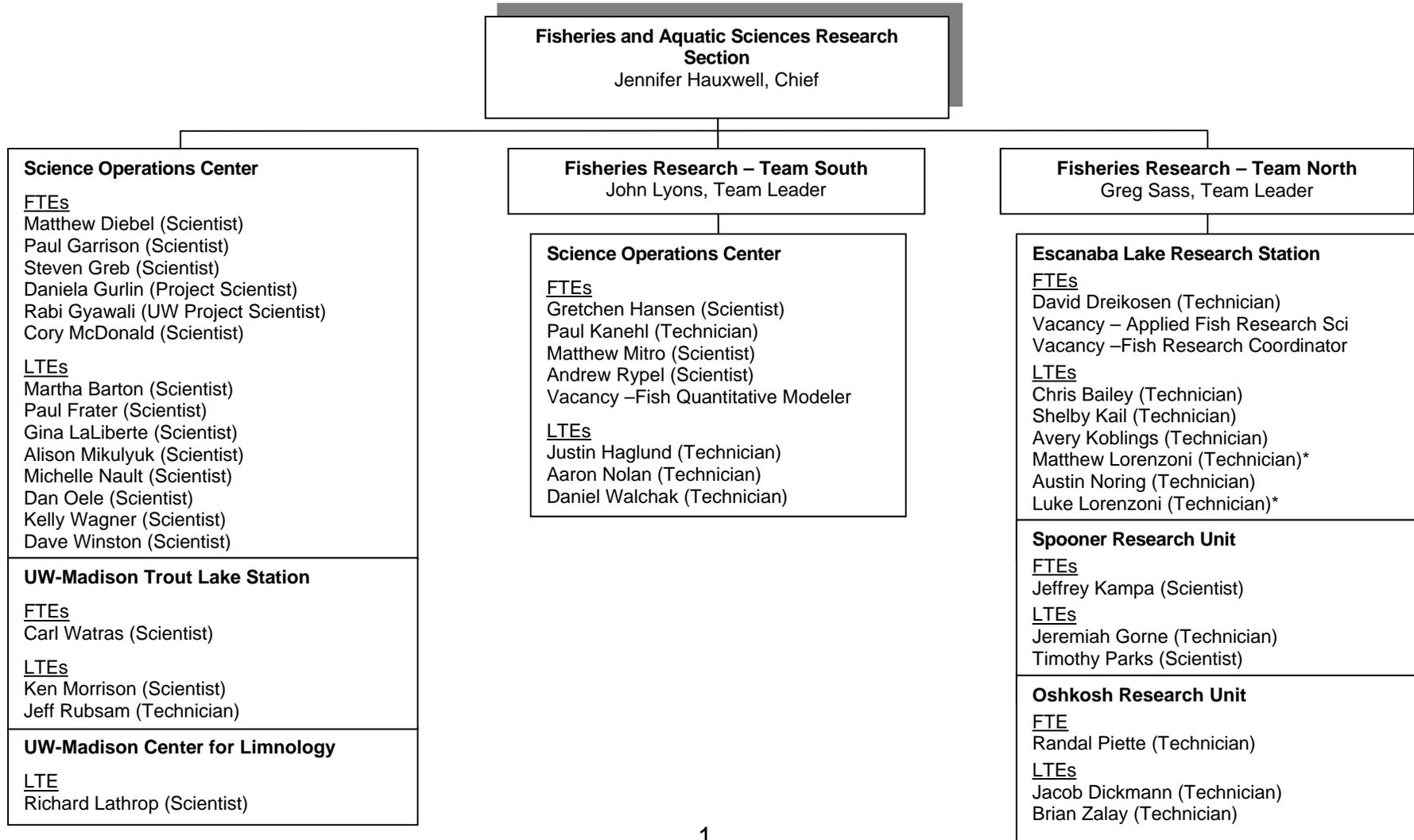


Fisheries and Aquatic Sciences Research – Organizational Chart

The following organizational chart identifies the Fisheries and Aquatic Sciences Research Section staff members located at six locations (as of 7/14): Science Operations Center (Madison), University of Wisconsin-Madison Center for Limnology campus and Trout Lake Station, Escanaba Lake Research Station (Northern Highland Fisheries Research Area, Boulder Junction), Oshkosh research unit, and Spooner research unit. (*Indicates work status as “on call, as available” for assistance with peak field work.)



Program Overview

Fisheries and Aquatic Sciences Research Program

The Fisheries and Aquatic Sciences Research program provides technical expertise to advise science-based management of the state's aquatic resources. Simply stated, our goal is to help our agency resource managers and the citizens of Wisconsin incorporate science in decision-making. To accomplish this goal our mission is:

Fisheries and Aquatic Sciences Research Mission

- *To conduct, sponsor, and coordinate priority research in support of the agency's natural resource management programs to protect and enhance the aquatic resources of Wisconsin;*
- *To provide a balance of research ranging from the landscape-scale for ecosystem management to the species scale, including socially and economically important species as well as species that are rare, threatened, or endangered;*
- *To provide technical expertise to meet Department needs for science-based decision making;*
- *To transfer scientific findings to DNR and partners;*
- *To define and address emerging information needs.*

The section is staffed by professional scientists and research technicians possessing diverse individual expertise in fisheries, aquatic ecology, limnology, biogeochemistry, and quantitative ecology. We conduct, sponsor, and coordinate original research within areas of fisheries and aquatic ecology that support the program missions of the bureaus of Fisheries Management and Water Quality, as well as other department programs including the bureaus of Watershed Management, Drinking and Groundwater, Natural Heritage Conservation, Air Management, the Division of Forestry, and the Office of Great Lakes. In addition, staff routinely engage in technical consultation and policy development, serve on various DNR teams, and generally serve as "experts" within their disciplines. Science professionals within this program actively engage in technology transfer activities through the publication and presentation of research results ranging in format from peer-reviewed scholarly journal articles to informal talks. In addition, research staff members serve as leaders in identifying emerging issues and information gaps for aquatic resource protection and management. While agency scientists focus their efforts on applied questions in Wisconsin, the management implications associated with their results inform national and even international audiences.

Program Overview

In this document, we describe our scientific contributions via technical consultation and provide summaries of current research projects and recent publications and presentations, as well as short biographies of our scientists and technicians.

This report covers activities from July 1, 2012 – June 2014 (fiscal years 2013 and 2014).

The economics of good science... take fishing, for example...

Wisconsin waters are home to 165 fish species. Wisconsin annually sells about 1.4 million fishing licenses to adult anglers, who spend about 20.8 million days fishing in the state annually. Nearly 41 percent of Wisconsin residents 16 and over participate in fishing, generating a \$2.75 billion economic impact. More than 30,000 Wisconsin jobs are supported by fishing, and fishing related activities and sales generate \$200 million in state tax revenues for local and state government (<1% is returned to DNR for traditional fisheries management). We help ensure angler's dollars are wisely spent. We do this by setting research agendas, and then conducting, sponsoring, and coordinating applied research within areas of fisheries and aquatic ecology that help the resource management programs and citizens of Wisconsin make informed decisions.



Science Services conducts research that supports healthy waters and sustainable fisheries for generations to come.

Table of Contents

Biennium in Review	5
Areas of research	5
Funding	5
Publications and Presentations	6
Customer Service to Our Partners	8
Awards, Recognition and Accomplishments	9
Recognizing our Partners	12
Teaming Up - Identifying Research Needs, Sharing Results, and Technical Consultation	13
Science Consultation Services - Teams	14
Science Consultation Services - Individual Contributions	17
Research Projects.....	35
Research Publications	56
2014	56
2013	60
2012	63
Research Presentations	66
2014	66
2013	72
2012	81
Scientist and Technician Index.....	86

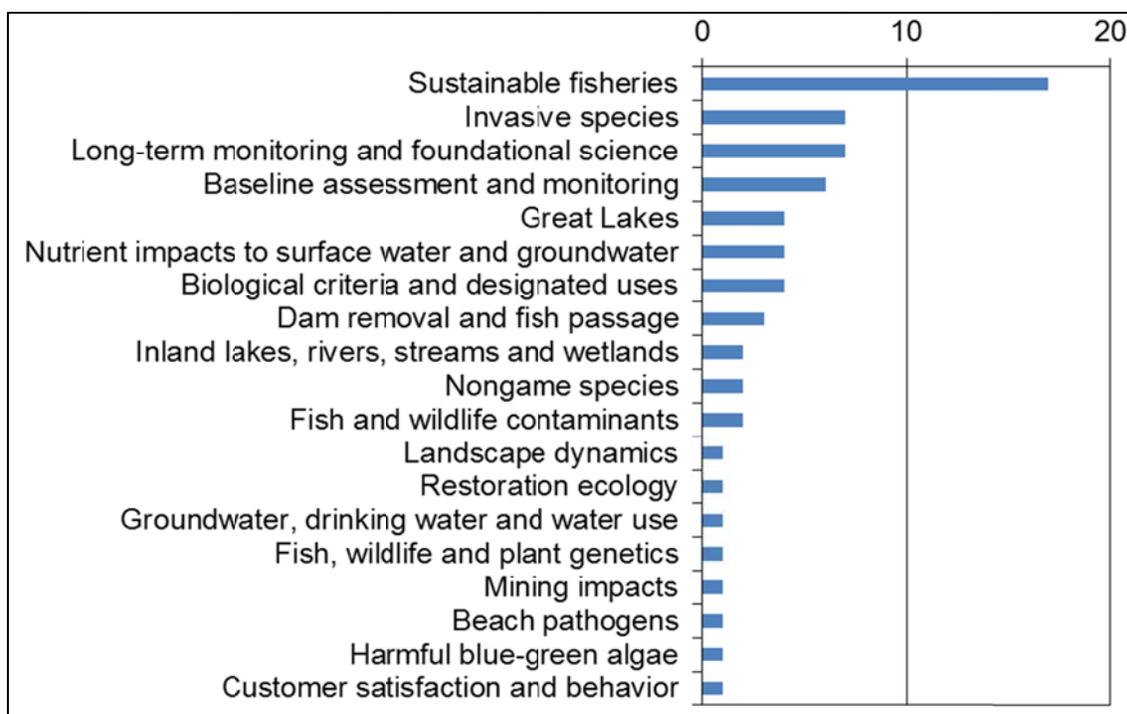
List of Abbreviations	
AFS	American Fisheries Society
AFWA	Association of Fish & Wildlife Agencies
AOC	Area of Concern
FY	Fiscal Year
PI	Principal Investigator
TMDL	Total Maximum Daily Loads
USGS	United States Geological Survey
UW	University of Wisconsin

2013-2014 Highlights

Biennium in Review

Areas of research

During this biennium there were a total of 66 research projects that spanned 19 priority focus areas under 5 of the major research themes in the DNR's Biennial Research Agenda that guide research topics across the state. The breakdown of research projects is displayed below, with the majority of projects covering topics specific to sustainable fisheries, invasive species, and long-term monitoring and foundational science.



The 66 current research projects for the 2013 – 2014 biennium. Projects are grouped by their priority focus area in the DNR Biennial Research Agenda (note, several focus areas overlap).

Funding

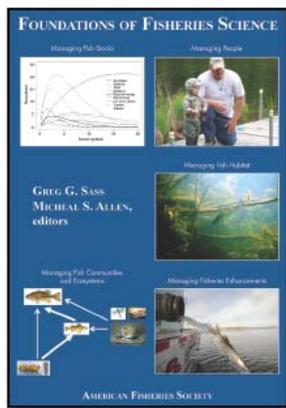
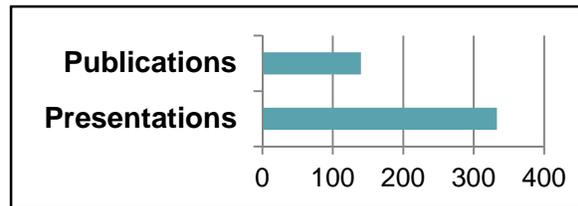
Projects are funded through a variety of sources, including state funds, federal Sport Fish Restoration funds, bureau-to-bureau contracts with partner programs, as well as external grants. Over the last three years, Science Services Research Scientists have been Co-Principal Investigators on external grant projects that totaled \$2.7 million!

2013-2014 Highlights

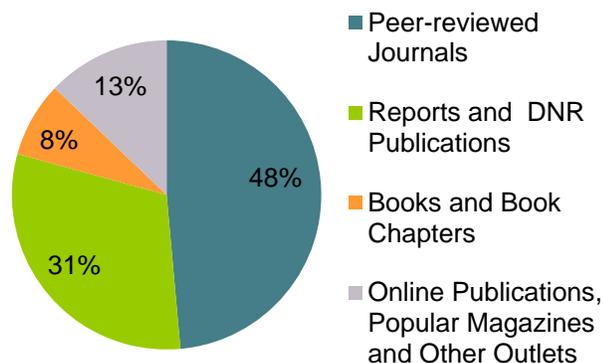
Funding Breakdown		
Section Base Funding Sources	Fiscal Year 2013	Fiscal Year 2014
Sportfish Restoration	\$650k	\$830k
Conservation Seg	\$19k	\$19k
Nonpoint Source	\$29k	\$29k
Aquatic Invasive Species Voluntary Checkoff	\$69k	\$69k
Additional Funding		
Internal Management Programs	\$275k	\$420k
External Grants	\$2.7 million (over 3 years)	

Publications and Presentations

Communicating research results to our internal and external partners and stakeholders is a critical part of our mission. The professionals employed by the Fisheries and Aquatic Sciences Research Section routinely publish the results of their work in a variety of outlets from peer-reviewed journals to internal reports. Presenting research results to a variety of professional, internal customers and public audiences is also an important way we share information. Presentations range from hour-long academic seminars to short scientific talks and are given to a variety of audiences. There were 140 publications and 333 presentations from July 2012 – May 2014.



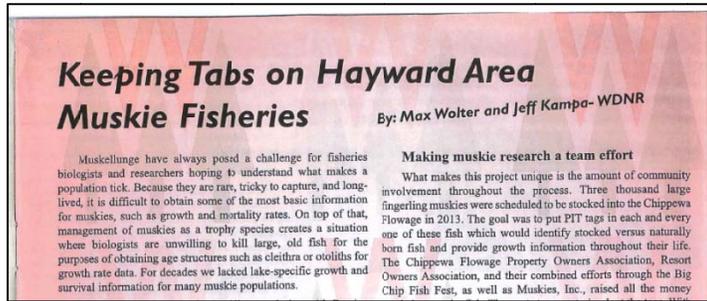
Greg Sass was co-editor of a book entitled "Foundations of Fisheries Science" published by the American Fisheries Society in 2014. This book highlights the seminal works that are most influential to fisheries management.



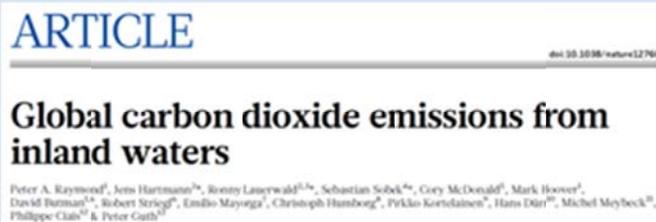
For the 2013-2014 biennium there were a total of 140 publications. 68 were in peer-reviewed journals, 43 in various reports and DNR publications, 11 books or book chapters, and 18 in various online publications, popular magazines and other outlets.

2013-2014 Highlights

In addition to technical audiences, there are a variety of ways in which our researchers make research results and expertise accessible to the general public. For example, researchers provided responses to reporters, wrote magazine articles, were featured on radio programs, participated in DNR online chats with the public, presented at citizen events, and developed YouTube videos on a variety of topics.



A recent paper in the journal Nature was coauthored by Cory McDonald.



Fisheries

Publication details, including instructions for authors and subscription information: <http://www.tandfonline.com/loi/ufsh20>

Prospects for Fishery-Induced Collapse of Invasive Asian Carp in the Illinois River

Iyob Tsehaye^a, Matthew Catalano^a, Greg Sass^b, David Glover^c & Brian Roth^d

A recent paper coauthored by Greg Sass is one of the most popular in Fisheries published in 2013! Currently there have been 1191 views of their article.

John Lyons' online e-book to the Fishes of Wisconsin was published in 2014 and available at the following website:

http://infotrek.er.usgs.gov/wdnr_fishes/index.jsp



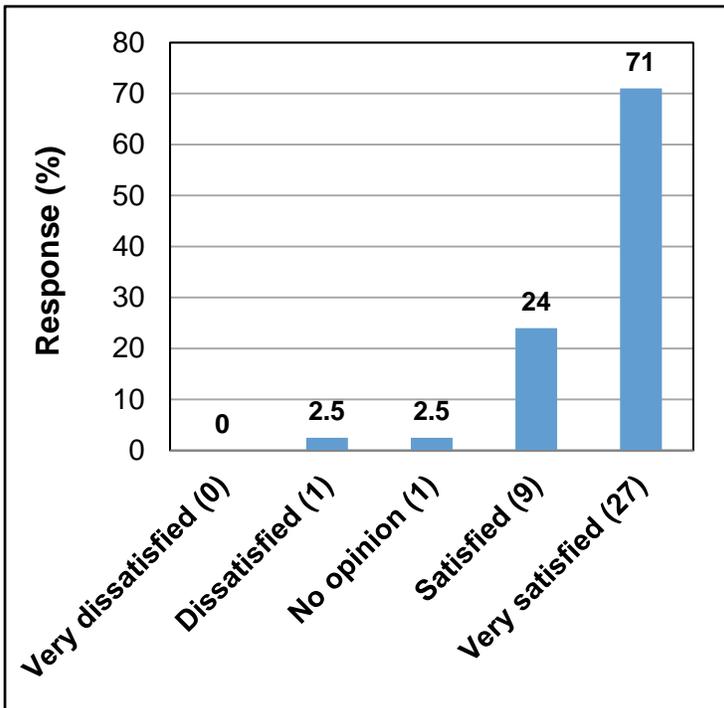
2013-2014 Highlights

Customer Service to Our Partners

We tallied the results of a questionnaire designed to solicit feedback related to science communications, research priorities, and the science-management partnership with our partners at the 2014 Water Resources Statewide Meeting. Out of approximately 80 Water Resources attendees, 41 surveys were returned. Results indicated 75% of water resources respondents had up to daily (8%), weekly (33%), or monthly (33%) interactions with SS researchers. The remaining 25% interacted either annually or a couple of times per year. Satisfaction rates with the current level of interaction with SS were: 66% very satisfied, 29% satisfied, 5% no opinion, 0% dissatisfied, 0% very dissatisfied. There are a wide range of ways in which water resources staff interact with SS researchers and receive communications from SS researchers (in order from most common to least common = email, phone, individual meetings, statewide meetings, team meetings, presentations and seminars, Science Logbook, publications,



There are a variety of ways in which we serve our partners through original research, technical consultation and outreach. Top: 2013 Science Services Open House in Gef 2. Bottom: Research presentation at the 2014 Water Resources Statewide Meeting.



professional conferences, SS Open House, section biennial report, etc). This was a useful tool for gauging our level of service to Water Resources.

For the question: "In general, how satisfied are you with the research and technical support you receive from SS?", the responses were: 71% very satisfied, 9% satisfied, 2.5% no opinion, 2.5% dissatisfied, 0% very dissatisfied.

2013-2014 Highlights

Awards, Recognition and Accomplishments

Researcher(s)	Award, recognition or accomplishment
John Lyons, Matt Mitro, Matt Diebel	Wisconsin Stream Model project led by section researchers and several key external partners, was named winner of the American Fisheries Society 2014 Sport Fish Restoration Outstanding Project Award for Research and Surveys
Matt Diebel	Co-Principal Investigator on 2 recent grants awarded in FY14 – \$336,862 and \$357,854; Received the Water Resources Partner award at the Water Resources statewide meeting for his work in supporting a number of projects for this program 
Matt Diebel and John Lyons	2012 and 2013 winners of the Science Services Bureau Employee of the Year Award.
Dave Dreikosen, Matt Lorenzoni, Greg Sass, Escanaba Station staff	Interviewed 2500 anglers 365 days a year at the creel station
Michelle Nault, Martha Barton, Paul Frater	Sampled 20,212 sites in lakes across Wisconsin from July 2012 – September 2013 for aquatic plant species presence and relative abundance.
Paul Garrison, Caitlin Carlson	National leadership for Environmental Protection Agency National Condition Assessment projects
Steve Greb	PI on external grant awarded in FY13 to 14 - \$180k; Member of the International Ocean Color Coordinating Group and co-chair of the Group on Earth Observations water quality task
Steve Greb and Matthew Mitro	2012 and 2013 winners of the Steve Serns Excellence in Research Award
Rabi Gyawali	Leading major project on Wisconsin rivers hydrology
Gretchen Hansen	PLOS one paper on aquatic invasive species, foundational science for Wisconsin Walleye Initiative stocking plan
Jennifer Hauxwell	WDNR Secretary's PRIDE award in the Excellence in Leadership category (2012) – nominated by section staff and also Rebecca Wallace Award Nominee (2012) 

2013-2014 Highlights

Researcher(s)	Award, recognition or accomplishment
Jeff Kampa	Muskellunge, Lake Sturgeon, Propagation Research, major walleye stocking findings, <i>Wisconsin Natural Resources Magazine</i> article
Paul Kanehl, Dan Walchak, Justin Haglund, Aaron Nolan	During the five months of sampling in 2013 - shocked 35.4 miles of stream, fished 80 overnight nets, and captured 14,015 fish <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div>
Susan Knight	 2012 recipient of UW-Madison Heidemann Award for Excellence in Public Service and Outreach
Gina LaLiberte	Statewide coordinator for cyanobacteria monitoring and response
Dick Lathrop	Recent paper in <i>Inland Waters</i> – Water quality implications from 3 decades of phosphorus loads and trophic dynamics in the Yahara chain of lakes
John Lyons	Co-PI on 4 external grants awarded FY12 -13 with university and other agency partners - \$1.2 million
Cory McDonald and Dick Lathrop	Co-PIs on Joint Solicitation Groundwater Grant - \$51k
Cory McDonald	Coauthor on 2013 <i>Nature</i> paper Global Carbon Dioxide Emissions from Inland Waters
Alison Mikulyuk	2012 recipient of a National Science Foundation Graduate Research Fellowship (\$90k)
Michelle Nault, Kelly Wagner, Alison Mikulyuk, Martha Barton	Recipients of 2013 Lake Stewardship Award for Public Service at the 35 th Annual Wisconsin Lakes Partnership Convention and the 2013 WDNR Secretary's PRIDE Honorable Mention Award Winner. <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div>

2013-2014 Highlights

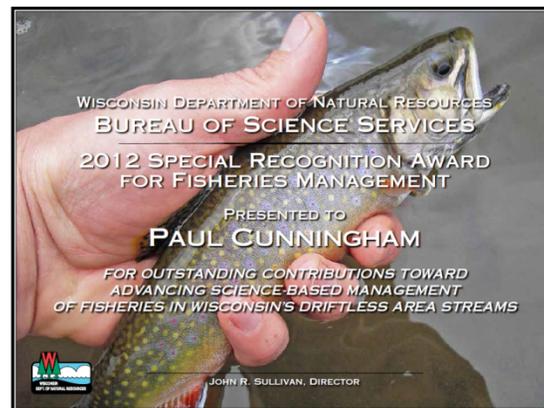
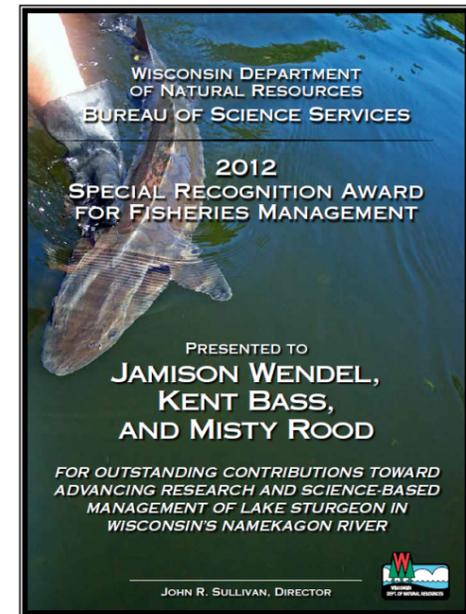
Researcher(s)	Award, recognition or accomplishment
Tim Parks	Published a recent paper in <i>American Midland Naturalist</i> .
Randal Piette	PI on external grant awarded in FY13 to 14 - \$35k (direct request from Natural Heritage Conservation Bureau), statewide mussel support
Andrew Rypel	Invited to National Center for Ecological Analysis and Synthesis (2/14), major papers published
Greg Sass	<i>Foundations of Fisheries Science</i> book was published by American Fisheries Society
Kelly Wagner, Alison Mikulyuk, Dan Oele, Jen Hauxwell	External grant awarded FY12-14 (Environmental Protection Agency) for invasive species research - \$385k (direct request from Water Quality Bureau)
Carl Watras, with support from Ken Morrison and Jeff Rubsam	<p>Major research paper in <i>Geophysical Research Letters</i> – Decadal oscillation of lakes and aquifers in the upper Great Lakes region of North America: Hydroclimatic implications.</p>  <p>During the summer of 2013, the experimental research occurring on Little Rock Lake, Vilas County, came to an end after 30 years. This research was paramount in showing the sensitivity of Wisconsin Lakes to acid rain and mercury pollution. This long-term research project resulted in approximately 130 peer-reviewed papers and about 20 graduate student theses along with numerous research collaborations from around the world. This research also helped to inform the legislature shape regulations that are intended to improve clean air and water.</p>

2013-2014 Highlights

Recognizing our Partners

On an annual basis, Science Services recognizes partners in other programs who advance science-based management of Wisconsin's waters and fisheries. Science is a critical foundation for sound decision-making. However, the utility of scientific information is limited were it not for the agency's resource managers to understand and apply it as they make natural resource decisions. For their outstanding efforts toward science-based management on a variety of aquatic issues (2012-14), we recognized and congratulate:

- Jamison Wendel, Kent Bass, and Misty Rood (Fisheries Management)
- Paul Cunningham (Fisheries Management)
- Scott van Egeren (Water Quality)
- Kristi Minahan (Water Quality)



Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

Teaming Up - Identifying Research Needs, Sharing Results, and Technical Consultation

The Fisheries and Aquatic Sciences Research team collaborates closely with natural resource managers to identify research needs as well as to share relevant research results in a timely manner. In addition to the project-based research identified in the following section, individual staff members in the Fisheries and Aquatic Sciences Research Section routinely provide technical consultation services to our natural resource management programs, with a particular emphasis on Fisheries Management and Water Resources. These services support programmatic functions ranging from routine management decisions on a particular water body to setting statewide policy on a particular issue.



Matt Diebel leads a breakout session on high capacity wells, stream flow, and fisheries impacts during a workshop at the 2014 Fisheries Management Biologist meeting.

We have multiple systems in place to ensure our partnership with management programs will achieve shared goals. Specific processes for integrating research and management include:

- Development of Management Bureau Strategic Plans (6-year)
- Development of agency-wide research agenda (biennial)
- Fisheries Management and Science Services Bureau Statewide Meetings (biennial); Statewide Water Quality Biologists (annual)
- Wisconsin Lakes Partnership (annual convention, quarterly meetings, monthly conference calls)
- Formal check-in with Lakes and Monitoring section chiefs to discuss past research and plan next projects and funding (annual)
- Species, Monitoring, Policy Technical Teams (monthly to annual)
- Fisheries Management Board and Water Resources Policy and Management Team (monthly)
- Interactions with Fisheries Management and Water Quality staff (daily - weekly)
- Recruitment of new staff (as needed)
- Targeted interactions with other programs (Watershed, Drinking and Groundwater, Great Lakes)

This section highlights team participation, technical consultations, and policy development efforts by the section during the past biennium. Services provided are listed by team and by individual staff.

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

Science Consultation Services - Teams

Below we list the formal team assignments of research section staff on management program teams or other councils.

Fisheries	
Team	Researcher(s)
Fisheries Management Board	Jen Hauxwell
Wisconsin Fisheries Advisory Council	Jen Hauxwell
Fisheries Management Fisheries Propagation Team	Jeff Kampa
Fisheries Management Database Team	Gretchen Hansen
Fisheries Management Urban Fishing Team	Matt Mitro
Fisheries Management Muskellunge Team	Jeff Kampa
Fisheries Management Walleye Team	Greg Sass, Gretchen Hansen, Jeff Kampa
Fisheries Management Bass Team	John Lyons, Gretchen Hansen
Fisheries Management Panfish Team	Andrew Rypel
Fisheries Management Sturgeon Team	Jeff Kampa
Fisheries Management Catfish Team	Randal Piette
Fisheries Management Trout Team	Matt Mitro
Fisheries Management Northern Pike Team	Andrew Rypel, Dan Oele
Fisheries Management Fish Ageing Task Group	Matt Mitro
WDNR Prairie du Sac dam working group	John Lyons
WDNR Beaver Management Team	Matt Mitro
WDNR Aquatic Organism Passage Team	Matt Diebel (John Lyons ad hoc)

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

Fisheries	
Team	Researcher(s)
Wisconsin Initiative on Climate Change Impacts Fisheries Working Group	Matt Mitro, John Lyons, Gretchen Hansen, Andrew Rypel
Wisconsin Initiative on Climate Change Impacts Driftless Area Working Group	Matt Mitro
Wisconsin Conservation Congress Warm Water Advisory Committee	Andrew Rypel
Wisconsin Conservation Congress Trout Advisory Committee	Matt Mitro
AFWA Research and Climate Change Standing Committees	Jen Hauxwell
Mississippi Inter-State Cooperative Resource Association Sturgeon and Paddlefish Committee	John Lyons
Fishers and Farmers Partnership for the Upper Mississippi River Basin Steering Committee and Science and Assessment Team	Matt Mitro
Fisheries Management Bureau New Employee Orientation	John Lyons, Paul Kanehl and crew, Greg Sass, Jen Hauxwell, Gretchen Hansen, Matt Diebel, Andrew Rypel, Matt Mitro, Jeff Kampa
Statewide Mussel Team	Randal Piette

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

Water Quality	
Team	Researcher(s)
Water Resources Policy Team	Jen Hauxwell
Lakes Monitoring Technical Team	Paul Garrison, Michelle Nault, Kelly Wagner, Susan Knight, Matt Diebel, Cory McDonald
Rivers and Streams Monitoring Tech Team	John Lyons, Matt Diebel
Water Quality Modeling Tech Team	Matt Diebel, Cory McDonald
Aquatic Invasive Species	Michelle Nault, Martha Barton, Kelly Wagner, Alison Mikulyuk
Site-Specific Water Quality Criteria Team	Matt Diebel
Statewide Blue-Green Algae Coordinator	Gina LaLiberte
Wisconsin Consolidated Assessment and Listing (WisCALM) development science contributors	Matt Diebel, Paul Garrison, Steve Greb, John Lyons, Jen Hauxwell, Alison Mikulyuk, Michelle Nault, Scott Van Egeren, Gina LaLiberte
Nutrient Criteria Development Team	Matt Diebel, Cory McDonald
DNR Invasive Species Team	Dreux Watermolen, Michelle Nault
Wisconsin Initiative on Climate Change Impacts Central Sands Working Group	Steve Greb
Wisconsin Lakes Partnership	Paul Garrison, Steve Greb, Matt Diebel, Susan Knight, Jen Hauxwell, Alison Mikulyuk, Michelle Nault, Martha Barton, Kelly Wagner, Gina LaLiberte, Greg Sass, Cory McDonald, Carl Watras
Great Lakes Monitoring Team	Steve Greb, Paul Garrison
WDNR Mining Implementation Team	Cory McDonald
Interagency council on nearshore monitoring Great Lakes	Steve Greb
Wisconsin Initiative on Climate Change Impacts Water Resources Working Group	Jen Hauxwell, Matt Diebel, Steve Greb, Paul Garrison, Dick Lathrop, Cory McDonald, Gretchen Hansen

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

Science Consultation Services - Individual Contributions

Below we list some of the individual contributions of research section staff toward management program and stakeholder initiatives. **This is only a partial listing of the types of services section staff members have contributed, but provides an overview of the wide range of technical consultations routinely provided, yet difficult to quantify.**

Martha Barton

- Analyzes aquatic macrophyte distributions in order to improve management of aquatic invasive macrophytes throughout WI
 - Conducts literature reviews on topics of interest to support better decision making and research opportunities
 - Coordinated a science and policy symposium for agency Aquatic Plant Management and fisheries staff on the efficacy and effects of herbicide use in lakes in WI, led the development of a 10-year retrospective of science support to the Aquatic Plant Management program and web tools and communications, and development of a Natural Resources Magazine article on Aquatic Plant Management at the request of the Water Quality Bureau
 - Created preliminary web-based approach to deliver all aquatic macrophyte research products to the public and internal partners
 - Creates lake reports to distribute to aquatic plant management coordinators, lake associations, or outside researchers upon request
 - Collaborates on original management research projects related to invasive species ecology and their management (US Army Corps of Engineers)
 - Co-leads semi-annual training workshops on aquatic macrophyte data collection, data analysis and identification
 - Provides updates to the public and Dane County Lakes and Watershed Commission on aquatic plant research project
-

Matthew Diebel

- Provided support on high capacity well applications as well as technical assistance on setting public rights stage for streams in WC district. The work for the public rights stage determination will include applying Wisconsin streams Ecological Limits of Hydrologic Alteration model to the sites in question to determine minimum flows needed to be protective of the fish community
- Led an effort to prioritize culvert replacements for aquatic organism passage statewide. This issue was prioritized by the Secretary's office, and involves staff from several other bureaus, including Fisheries, Water Quality, Watershed, and Energy, Transportation, and Environmental Analysis. Developed a budget initiative to prioritize and fund culvert replacements that would result in fisheries habitat improvement

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Developed a spreadsheet tool for evaluating whether a fish survey was conducted during extreme (wet/dry, warm/cool) weather conditions. This tool will be used by Water Resources staff as part of the stream natural community verification process
- Contributed to the workgroup for site-specific and biological criteria for phosphorus to provide input on algal criteria
- Developed and trained Fisheries and Water Resources staff in use of a spreadsheet model to evaluate effects of stream flow reductions on fish.
- Performed an analysis to determine whether the phosphorus allocations in the Rock River TMDL would allow the Yahara Lakes to meet phosphorus standards. The analysis was submitted to Environmental Protection Agency by the Water Quality Bureau
- Provided review of groundwater proposals for DNR Drinking and Groundwater staff coordinating the state's Groundwater Coordinating Council Joint solicitation
- Participated in two-story fisheries work group for phosphorus standards
- Assisted the Water Evaluation Section with revising lake and stream water quality assessment protocols
- Conducting water quality data analysis to support development of water quality criteria for streams and lakes for the Wisconsin Consolidated Assessment and Listing Methodology
- Serves as technical advisor on Water Quality Bureau TMDL Modeling Team
- Responds to frequent stakeholder inquiries about the Rock River TMDL
- Serves on Water Quality Bureau's nitrogen criteria development team
- Serves on the Stream Monitoring Technical Team
- Serves as Department representative on Great Lakes-Upper Midwest Landscape Conservation Cooperative Aquatic Connectivity Initiative

Paul Garrison

- Contributed to the workgroup for site-specific and biological criteria for phosphorus to provide input on algal criteria
- Works with the Environmental Protection Agency and other algal taxonomists developing the Environmental Protection Agency's National Stream and River Assessment Survey
- Participated in the Wildlife Action Plan working group meeting to discuss a potential new classification system for Wisconsin's inland lakes
- Contributed to the two-story fisheries work group for phosphorus standards
- Participated in the Water Quality competitive grant ranking team
- Works with lake associations to develop management plans
- Works with lake associations and DNR lake managers to set water quality goals
- Works with Water Quality Bureau to develop phosphorus standards
- Works with Water Quality Bureau for Classification, Monitoring, & Assessment of Wisconsin's Lakes
- Coordinated section grant with Environmental Protection Agency for conducting and interpreting data from National Lake Assessment
- Works with Tribes to understand limnological history of their lakes and the causes of any degradation
- Works with DNR lake managers to understand zooplankton community for biomanipulation projects

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Routinely serves as speaker for Wisconsin Lakes Partnership at the annual Wisconsin Lakes Convention and instructor for Wisconsin Lakes Partnership Lake Leaders course. Served as a science lead for Water Quality Bureau's Assessment Methodology Team
 - Served on Steering Committee for Environmental Protection Agency National Lake Assessment 2012
 - Served as national trainer for Environmental Protection Agency National Lake Assessment 2012
-

Steve Greb

- Consulted on Petenwell-Castle Rock nutrient management issue and provided satellite data to evaluate water clarity variations across lake basins
 - Proposed and received funding for a budget initiative to move Wisconsin forward in using remote sensing technology to monitor and manage lakes
 - Serves on Wisconsin Lakes Partnership
 - Serves on Wisconsin's Initiative on Climate Change Impacts Water Resources, Hydrology, and Central Sands working groups
 - Serves on Water Quality Monitoring Team
 - Serves on Great Lakes Monitoring Team
 - Serves as NASA colleague reviewer for current and future water quality related projects
 - Chair of the Water Quality Working Group for Group on Earth Observation
 - Steering Committee Chair for NASA/NOAA Algorithm working group
-

Gretchen Hansen

- Provided technical support for implementing the Wisconsin Walleye Initiative - Provided estimates of the probability of natural walleye recruitment in all lakes proposed for walleye stocking to be used to prioritize stocking decisions, developed evaluation plans, developed budget initiative to study outcomes of the Wisconsin Walleye Initiative
- Participated in multiple (6+) meetings aimed at evaluating the current walleye management system for the Ceded Territory, including analyses of alternative methods of predicting walleye populations when they are unknown, and incorporating walleye production in the analysis
- Attended a Technical Working Group meeting with DNR, Great Lakes Indian Fish & Wildlife Commission, Voigt Task force, and Mole Lake representatives to present a new model for estimating walleye populations in the absence of field data
- Provided consultation and detailed report outlining the use of a new method for estimating walleye populations to potentially be used for setting walleye bag limits this year at the request of Fisheries Management Bureau and Treaty programs
- Worked with panfish team leaders from fish management to consult on design of adaptive management approach to regulation changes. Developed a simulation model to assess the statistical power of being able to detect changes in panfish size structure in response to regulation changes given high levels of among-lake variability
- Led a two-day workshop at Trout Lake Station for WDNR regional biologists and supervisors to design an adaptive management monitoring and evaluation plan for the existing regulation changes in response to bass increases and walleye decreases

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Consulted with Southern district fisheries managers and supervisors to discuss status and future of Lake Mendota biomanipulation project
- Worked with colleagues at the Center for Limnology to develop a food web model for Escanaba lake using Ecopath with Ecosim
- Met with Minnesota DNR staff to discuss initial results and development future work plans for an interstate project that will describe historical and current distribution of cisco across the region. Related work on climate change and coldwater fish communities in lakes was also presented
- Participated in a cross-state bass meeting between Wisconsin and Minnesota to discuss status, trends, and collaborative opportunities between the two states
- Provided statistical consultation to Dan Isermann (UW-Steven's Point) for his analysis examining the utility of various biological performance indicators as in tracking walleye exploitation in the ceded territory
- Met with Steve Carpenter (UW-Madison) and Jon Hansen (DNR Fisheries Management) to plan an adaptive management workshop held January 2014 to develop a monitoring and evaluation strategy for the experimental bass-walleye regulation lakes
- Met with Dan Isermann (UW-Steven's Point), Jon Hansen (DNR Fisheries Management), and UW-Steven's Point master's student Hadley Boehm to outline the approach to research project examining early life history of walleye in northern WI
- Met with Aquatic Invasive Species and Fisheries Management staff to discuss rapid response and research opportunities surrounding the newly discovered invasive New Zealand Mudsnail in Black Earth Creek
- Participated in a meeting with water resources staff on the Lake Monitoring strategic plan
- Consulted with the fish management bass team leader to develop categories of lakes based on largemouth bass abundance and growth that could be used to guide regulations. These results were presented to the Fisheries Management board
- Participated in a collaborative meeting including representatives from WDNR Science Services, WDNR Fish Management, and Michigan State University to discuss their walleye population model and its utility in simulating different regulatory scenarios. At this same meeting, also presented an update on statistical analysis of trends in walleye and largemouth bass populations statewide

Jennifer Hauxwell

- Provides leadership, strategic planning, and supervision on the scientific, collaborative, and administrative duties associated with successfully implementing the Wisconsin DNR's Fisheries and Aquatic Sciences Research Program, comprised of 40-50 scientists and technicians with an operating annual total budget of approximately \$2.7 million, including grant submission and reporting for federal Sportfish Restoration grants, as well as other federal, state, and external grants.
- Provides updates to the DNR Research Review Team and Water Division bureaus (Fisheries Management, Water Quality, and Watershed Management) on section staff, funding, projects, and processes/integration with the Water Division for priority-setting

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Represents DNR at the Wisconsin Fisheries Research Cooperative Coordinating Council at UW-Steven's Point Serves on Wisconsin Sea Grant Advisory Council, providing input on opportunities where Sea Grant funding focus overlaps with DNR priorities
- Attends the Wisconsin Fisheries Advisory Council meetings to learn about science needs of the council and how agency scientists and collaborators can best support the goals of the council
- Coordinated a science and policy symposium for agency Aquatic Plant Management and fisheries staff on the efficacy and effects of herbicide use in lakes in WI, led the development of a 10-year retrospective of science support to the Aquatic Plant Management program and web tools and communications, and development of a Natural Resources Magazine article on Aquatic Plant Management at the request of the Water Quality Bureau
- Coordinated the development of the non-lead tackle implementation plan for tackle on Escanaba, Nebish, and Palette Lakes
- Provided comments on Water Quality Bureau's strategic plan, to better incorporate the role of science and science staff
- Served on Fisheries Management interview panels for Fisheries Biologist recruitments
- Serves on the graduate committee for Center for Limnology doctoral candidate Alison Mikulyuk (advisor Jake Vander Zanden)
- Provided updates of Fisheries and Management Research for the Fish, Wildlife and Habitat Management Plan
- Serves on Fisheries Management Board
- Serves on Water Quality Bureau's Water Resources Policy Management Team
- Serves on Wisconsin Initiative on Climate Change Water Resources Working Group; served as reviewer for first report on adaptive assessment
- Co-chair of the Program Committee, and member of the Host Committee of the North American Lake Management Society 2012 Meeting
- Member of the planning committee for 3rd Science in the Northwoods Conference, Boulder Junction, WI; October 2014
- Co-leader of the Aquatic Plants and Algae Species Assessment Group for the Governor's Council on Invasive Species, charged with reviewing potential species invasivity for WI and facilitating regulatory designations from a group of technical experts and stakeholders
- Represented the WDNR research program at Lakes Partnerships meetings, university collaborators, internal program meetings, and other stakeholders
- Works with collaborators on original management research projects related to invasive species ecology and management and the effects of land use on aquatic communities (University of Wisconsin, US Army Corps of Engineers)
- Presents annual research overview for Fish Management new employee orientation

Jeff Kampa

- Consulted on adding muskellunge PIT tag data to the Fisheries Management statewide database
- Participated in a meeting to review Wisconsin Sea Grant aquaculture grant proposals
- Participated in the St. Croix River Interagency fisheries meeting

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Participated in the 2013 Coolwater Hatchery Production wrap up meeting. Met with Minnesota DNR staff to discuss initial results and development future work plans for an interstate project that will describe historical and current distribution of cisco across the region. Collaborated with Minnesota DNR in developing a multistate cisco assessment database
- Initiated a collaborative effort with Dr. Jim Church at UW-Stout to describe cisco morphometric variation among several populations in Wisconsin
- Participated in a Fisheries Management Walleye Team meeting to determine future stocking and evaluation plans for the Wisconsin Walleye Initiative
- Participated in multiple (6+) meetings aimed at evaluating the current walleye management system for the ceded territory, and provided updates on analyses of alternative methods of predicting walleye populations when they are unknown, and incorporating walleye production in the analysis
- Reviewed recent walleye stocking/culture articles from AFS Journals
- Met with the Natural Heritage Inventory personnel in Spooner, along with other forestry, wildlife, and fisheries managers to discuss and propose potential revisions to the Wildlife Action Plan
- Consulted with the fish propagation staff at the Governor Thompson Fish Hatchery in Spooner, to determine the sampling statistics needed to estimate number of walleye or musky displaced by water in stocking trucks
- Worked with the Osceola Hatchery and discussed the logistics of using the fish loader and trying to determine the optimal sample size for weight counts at Osceola during the April, 2014 harvest
- Provided input on walleye stocking guidelines for Private Producers as part of the Wisconsin Walleye Initiative
- Provided a review of Lake Sturgeon Options for Private Aquaculture in Wisconsin for the Bureau of Fisheries Management (requested by Kaas)
- Participated in the Lake Sturgeon Team meeting at Stevens Point
- Consulted with Jeff Scheirer (Park Falls) on the musky stocking program for Lake of the Pines
- Cooperated with musky guides and musky club members in the Hayward area to assemble volunteer catch data (including PIT tagged musky) to supplement growth data, obtain size structure of angler-caught muskellunge and evaluate the potential to use angler data as a recapture sample for adult musky population estimates
- Provided a review of a study proposal from Oshkosh Area Fish Management "Habitat Use of Sub-Adult Lake Sturgeon in the Lower Wolf River, Wisconsin"
- Provided guidance to Barron Fish Manager Aaron Cole on PIT tagging stocked fingerling muskellunge from the Governor Thompson hatchery
- Participated in weekly Hatchery Conference Call updates with Fish Management Supervisors and UW-Stevens Point Fish Propagation Science Center
- Reviewed the Lake Superior Biodiversity Conservation Assessment Final Report and provided implementation suggestions to Lake Superior Basin Leader
- Reviewed the Wisconsin section of a draft Lake Superior Biodiversity Conservation Assessment, which is being coordinated by The Nature Conservancy of Canada
- Participated in a meeting with Minnesota DNR and the Natural Resources Research Institute, University of Minnesota to discuss coldwater fish data exchange in support of climate change modeling efforts at the Natural Resources Research Institute

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Met with the Lake Superior Binational Lakewide Management Plan Coordinator to discuss the Lake Superior Biodiversity Conservation Strategy along with related research issues on Lake Superior
- Participated in the Fish Management research prioritization meeting
- Served on Fisheries Management Fish Propagation team
- Served on Fisheries Management Walleye team
- Served on Lake Sturgeon team
- Served on Muskellunge team
- Presented annual training modules for Fish Management new employee orientation
- Provided technical support to WDNR-funded projects under contract to UW-Steven's Point Cooperative Fisheries Research Unit
- Provided technical review of consultants Comprehensive Study of Wisconsin's Fish Propagation System

Susan Knight

- Provided the plenary session at the Wisconsin Lakes Convention "Celebrating 3 decades of research at Little Rock Lake". Moderated by Glen Moberg, Wisconsin Public Radio
- Conducted plant identification workshops at the 2012-2014 Wisconsin Lake Conventions
- Conducted plant identification workshops at Kemp Biological Station in 2012-2014
- Conducts various plant identification and plant ecology workshops for citizens
- Conducts aquatic plant surveys
- Conducted research on air tolerance of aquatic invasive species
- Conducting research on effectiveness of milfoil weevil to control Eurasian water-milfoil
- Gave presentations throughout state on declining water levels
- Served as Interim Director at UW-Madison Center for Limnology Trout Lake Station 2010-2012
- Helps coordinate and moderate Science on Tap-Minocqua, a monthly outreach series of science conversations
- Participating in DNR aquatic invasive species technical review teams



Susan Knight teaching aquatic plant identification to a diverse audience including university students, state employees, private contractors and citizen lake groups.

Gina LaLiberte

- Statewide Blue-Green Algae Coordinator: for CDC-funded Department of Health Services program to track human and animal illnesses. Coordinate sampling, distribute and interpret results for local health officials, provide ecological and public health information about blue-green algae to citizens, DNR staff, public health officials, media, and Natural Resources Board

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Attended meetings and worked on setting permit criteria for dye application in Lake Delton with Water staff
- Participated in State of Wisconsin Hazardous Materials & Waste Disposal Awareness Training
- Met with the workgroup for site-specific and biological criteria for phosphorus to provide input on algal criteria
- Provided guidance on assessment of Green Bay Area of Concern cyanobacteria data
- Participated in a meeting on cyanobacterial monitoring with state government colleagues in Georgia, Kentucky, North Carolina, and Tennessee
- Participated in a conference call with the Environmental Protection Agency and other algal taxonomists working on the Environmental Protection Agency's National Stream and River Assessment Survey
- Worked on self-directed safety training in Hazard Communication, Laboratory Safety, and Formaldehyde Safety that will be used by Science Services and also by Water Division staff
- Conducted algal identification and aquatic invertebrate consultations for USGS, county staff, citizen volunteers, consultants, DNR lake managers, DNR state park staff, county aquatic invasive species staff, municipal managers, tribal lake water managers, lake educators, Illinois county staff, and lake homeowners, and provided information about ecology and management strategies
- Tentatively identified & discussed possible control strategies for diatom bloom in Wild Rose fish pond Fish Management
- Provided Harmful Algae Bloom Surveillance toxin data to Fish Management
- Evaluated plankton data for potentially toxin-producing cyanobacterial species for Bill James' (UW-Stout) Red Cedar Lake report
- Provides data for developing lake management plans by DNR managers with lake associations
- Provides data for setting water quality goals by DNR managers with lake associations
- Provides data for Classification, Monitoring, & Assessment of Wisconsin's Lakes with Water Quality
- Provides data to DNR and Environmental Protection Agency for National Lake Assessment, National Stream and River Assessment, and National Wetland Condition Assessment
- Provided guidance to Environmental Protection Agency in developing field and laboratory protocols for National Wetland Condition Assessment
- Educates citizens in understanding limnological history of their lakes and the causes of any degradation
- Science Operations Center chemical hygiene officer: developed self-directed safety training and materials in Hazard Communication, Laboratory Safety, and Formaldehyde Safety that are used by Science Services and other DNR staff, revised safety plans for Science Operations Center programs, coordinated building-wide laboratory chemical cleanup, brought programs into compliance with OSHA and Environmental Protection Agency regulations



Gina LaLiberte identifies diatoms under a microscope.

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

John Lyons

- Provided requested summary of potential impacts of suspended sediments on smallmouth bass and other fish species along Door County to Northeast District Water Leader
- At the request of Law Enforcement, was on call for three consecutive 24-hour periods in June to identify any fish observed in interstate commerce inspections jointly carried out by Law Enforcement and the Wisconsin State Control
- At the request of Water Quality, serving on team to develop proposed language and guidance for new administrative rules concerning designated uses and biocriteria for water quality standards
- Participated in multiple meetings and discussion to develop aquatic portions of State Wildlife Action plan for Bureau of Natural Heritage Conservation
- Participated in meeting with Lake Michigan Fisheries Technical Team to develop possible new research priorities for the coming biennium
- Helped develop a budget initiative to conduct science to evaluate the WI Walleye Initiative
- Provided comments on the 2014 Asian Carp strategic framework update at the request of the Water Quality Bureau
- Served on a panel of experts, who will conduct a form of a risk analysis (risk assessment, and input on risk management) pertaining to potential alternatives for a fishway with the purpose of providing safe, timely, and effective fish passage at Prairie du Sac Dam, Wisconsin River, Wisconsin, while also maintaining a barrier to the upstream movement of invasive species requested by US Fish and Wildlife Service
- Worked with Titus Seilheimer and Karl Scheidegger on Asian Carp ID materials that can be used in multiple different contexts by Law Enforcement
- Worked with Craig Berg, from the Milwaukee County Zoo about the possibility of the zoo maintaining captive populations of longear sunfish, starhead topminnow, and other characteristic Mukwonago fishes in an artificial outdoor pond
- Attended the Midwest Fish and Wildlife Conference and Mississippi Interstate Cooperative Resource Association Paddlefish and Sturgeon Committee (agency representative)
- Met with Minnesota DNR staff to discuss initial results and development future work plans for an interstate project that will describe historical and current distribution of cisco across the region
- Provided formal confirmation of identification for the fish used for bioassays by the WI State Lab of Hygiene as part of their Quality Assurance/Quality Control protocols
- Met with Southern Region and CO staff to discuss and plan for the review of an ongoing Environmental Assessment of fish passage at the Prairie du Sac Dam by the U.S. Fish and Wildlife Service
- Met with Western Region staff to discuss approaches to assessing environmental impacts of high capacity wells on streams in central Wisconsin



John Lyons presenting his research findings at the 2013 Fisheries Management Statewide.

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Provided expert consultation on fish issues to DNR attorneys at an administrative law hearing concerning high capacity well permits for Ridgefield Dairy
- Provided support to Water Division staff on coldwater lake fisheries (2-story fisheries)
- Responds to multiple daily requests from WDNR managers, biologists and administrators; other governmental agencies, universities, environmental consultants, and non-profit organizations inside and outside the U.S.; and the general public for identification of unknown fish specimens, use of photos of specific fish species, and provision of diverse information on aquatic ecology and fish biology. Provides training, makes presentations and gives interviews, and writes popular and technical articles
- Collects data and track the status of all rare fishes in the state, and provides information and guidance to appropriate WDNR programs as to how these species might be conserved
- Collects data and tracks the status of all known and potential exotic fishes in the state and provides information and guidance to appropriate WDNR programs as to the threat these species may pose and how they might be controlled
- Participates on WDNR technical teams and committees designated to develop and implement the state's Wildlife Action Plan, specifically to benefit fish Species of Greatest Conservation Need, for Natural Heritage Conservation, to provide guidance on designing and modifying road crossings to improve passage of fish and other aquatic organisms for Environmental Assessment and Fisheries Management; to help determine water levels that are sufficiently protective of fishes on the Rest Lake Chain and Manitowish River in Vilas County for Environmental Assessment, Water Quality, and Fisheries Management; to advise on the status and potential threat of invasive non-native fishes for Fisheries Management; to ensure that PCB remediation activities in the Pine Creek system in Calumet County do not harm fish populations for Natural Heritage Conservation Bureau and Water Quality; to help conserve the highly diverse fish fauna of the Mukwonago River in Waukesha County for Natural Heritage Conservation Bureau and Fisheries Management; to improve management of smallmouth bass and largemouth bass statewide for Fisheries Management; to design and implement a monitoring and assessment protocol for warm water streams and rivers for Fisheries Management; to develop a biological assessment strategy for streams and lakes for Water Quality; to establish a stream monitoring and assessment system for Water Quality; to implement an improved stream classification system for use by Fisheries Management and Water Quality
- Provides annual information to Fisheries Management and Water Quality on the status and trends of fisheries and fish communities in 13 different streams, rivers and lakes throughout the state
- Developed and helped implement new and powerful tools for monitoring and assessing stream and river ecosystems, including habitat assessment, fish surveys, and bioindicators such as the Index of Biotic Integrity
- Serves as the Wisconsin representative on the American Fisheries Society's endangered fishes committee, which documents and publicizes the status of all rare fishes in North America
- Serves on Fisheries Management Bass team
- Serves on Fisheries Management Baseline Monitoring Streams team
- Presents annual training modules for Fish Management new employee orientation
- Serves on Water Quality Streams Team

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Serves on Wisconsin Initiative on Climate Change Impacts Coldwater Fisheries Team
 - Serves as adjunct curator of fishes at the University of Wisconsin Zoological Museum, Madison
-

Cory McDonald

- Participated in pre-application meeting with GTAC, DNR, and other stakeholders, and participated in with the surface water monitoring team to determine baseline data collection requirements and strategy for proposed iron mine
 - Attended Ferrous Mining permitting team meeting
 - Provided technical review of the WI River TMDL Technical Scope of Work and attended stakeholders' meeting
 - Attended Wisconsin Initiative on Climate Change Impacts Working Groups Council meeting
 - Consulted with the ad hoc technical team on the iron mining white paper
 - Provided technical review of several lake management plans and reports
 - Provided review of groundwater proposals for DNR Drinking and Groundwater staff coordinating the state's Groundwater Coordinating Council Joint solicitation
 - Participated in Lake Water Quality Modeling Training at UW-Steven's Point College of Natural Resources
 - Co-PI on UW-Madison Center for Limnology Long-Term Ecological Research grant renewal proposal
 - Participated in Environmental Protection Agency Region 5 Numeric Nutrient Criteria workshop
-

Alison Mikulyuk

- Gave plenary presentation at the New England Association of Environmental Biologists Conference in Burlington, VT
- Participated in the Wildlife Action Plan working group meeting to discuss a potential new classification system for Wisconsin's inland lakes
- Coordinated a science and policy symposium for agency Aquatic Plant Management and fisheries staff on the efficacy and effects of herbicide use in lakes in WI, led the development of a 10-year retrospective of science support to the Aquatic Plant Management program and web tools and communications, and development of a Natural Resources Magazine article on Aquatic Plant Management at the request of the Water Quality Bureau
- Met with Water Quality Bureau to discuss Aquatic Plant Management-related research products and communications and their availability to internal and external partners and the public
- Participated in the first meeting of the Lakes Classification Technical Advisory Committee on a Nature Conservancy project to develop a conservation portfolio for Wisconsin Lakes
- Met with central office monitoring staff to discuss the use of macrophyte data in developing site-specific phosphorus criteria
- Works with Wisconsin Lakes Partnership to increase communication, collaboration and education about Wisconsin lakes and aquatic macrophytes
- Presents research and provides guidance to county aquatic invasive species coordinators

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Provides updates to the public and Dane County Lakes and Watershed Commission on aquatic plant research project
- Co-leads semi-annual training workshops on aquatic macrophyte data collection and identification
- Provides field assistance to DNR regional managers, citizens, and consultants
- Provides aquatic plant taxonomic assistance to a variety of stakeholders
- Serves on Wisconsin Lakes Technical Team
- Serves on Wisconsin Lakes Monitoring Team
- Develops technical documents and sampling schemes as requested by public and private audiences
- Coordinates field data collection, sets research priorities and design ecological field studies
- Conducts data analysis and provide technical assistance to lake managers and consultants in assessing aquatic plant distribution and abundance and response to management

Matthew Mitro

- Serves on and provides technical and scientific support to the Fisheries Management Trout Team and provided research update on Ash Creek brook trout study for discussion on change/options in wild brook trout spawning program and trout angling regulation proposals review.
- Participated in conference call with the Great Lakes Water Quality Agreement Groundwater Annex project leads to discuss groundwater science report request by the Drinking and Groundwater Bureau
- Completed stream temperature modeling report with USGS
- Participated in Fish Ageing Task Force and Fisheries Analysis Center initiatives
- Met with Aquatic Invasive Species and Fisheries Management staff to discuss rapid response and research opportunities surrounding the newly discovered invasive New Zealand Mudsail in Black Earth Creek.
- Attends the Boat and Gear Disinfection Meetings
- Provided consultation at the Driftless Area Land Conservancy planning meeting, consultation on climate change and streams
- Provided consultation to the Water Division, on use of HOB0 water level monitors to monitor stream flow in Tyler Forks watershed
- Chair of the Coldwater Fish and Fisheries Working Group for the Wisconsin Initiative on Climate Change Impacts, including collaboration on producing Wisconsin's first adaptive assessment to identify adaptation strategies to counter climate impacts on coldwater resources and report update for the Fish and Fisheries Working Group
- Served as fisheries/climate expert for DNR Adaptation Workshops for regional supervisors
- Steering Committee and Science and Assessment Team member representing WDNR on the Fishers & Farmers Partnership for the Upper Mississippi River Basin, to foster collaboration between WDNR and the agricultural community on locally-directed projects that support both healthy farm land and healthy streams and fish populations



Our trout research crew surveys a stream using backpack electrofishing.

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Works with Trout Unlimited Driftless Area Restoration Effort, including assistance to citizen monitoring of stream temperatures to evaluate how stream restoration projects can help lessen the impacts of a changing climate on stream temperatures
- Provides educational outreach on fisheries issues to Wisconsin public schools
- Provides outreach to angler constituent groups such as Trout Unlimited by sharing research and management findings and collaborating on stream restoration projects
- Provides technical and scientific support to the Beaver Management Team on trout fisheries issues, including contributions on beaver/trout research and climate change issues to the new Beaver Management Plan
- Provides technical and scientific support to the Streams Baseline Monitoring Program
- Serves on Fisheries Management Urban Fishing Team
- Provides technical support to WDNR-funded projects under contract to UW-Stevens Point and the Fisheries Cooperative Research Unit and serves on graduate student committees, ensuring projects address WDNR needs
- Provides field assistance in collecting trout for the WDNR wild trout stocking program
- Provides technical assistance in developing trout angler surveys on fishing regulations, creel data, and DNR programs supporting trout fisheries
- Provides technical reviews of Fisheries Management reports
- Provides assistance in fish taxonomic identification to WDNR wardens
- Presents research findings in WDNR seminar series to staff and public
- Serves as an associate editor for the North American Journal of Fisheries Management

Michelle Nault

- Participated in the Wildlife Action Plan working group meeting to discuss a potential new classification system for Wisconsin's inland lakes
- Coordinated a science and policy symposium for agency Aquatic Plant Management and fisheries staff on the efficacy and effects of herbicide use in lakes in WI, led the development of a 10-year retrospective of science support to the Aquatic Plant Management program and web tools and communications, and development of a Natural Resources Magazine article on Aquatic Plant Management at the request of the Water Quality Bureau
- Met with Water Quality Bureau to discuss Aquatic Plant Management -related research products and communications and their availability to internal and external partners and the public
- Participated in numerous Eurasian water milfoil management and research meetings
- Participated in several conference calls and provided edits and comments to the "Through the Looking Glass" aquatic plant field guide revision to be published summer 2014
- Provided comments and edits to the recently published, "Field Guide to Wisconsin Streams"
- Co-led the Aquatic Plant Species Assessment Group, part of the Wisconsin Governor's Council on Invasive Species. Participated in the public review sessions for the Wisconsin Invasive Species Council.



Michelle Nault coordinating the Aquatic Plants and Algae Species Assessment Group for the Governor's Council on Invasive Species.

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Provides leadership and training for implementing statewide standardized baseline monitoring of aquatic plant communities for grant-funded projects (provides standardized GIS-based lake sampling maps; conducts annual training for water resources staff, volunteers, and private consultants statewide to implement standardized protocol, specimen identification, sampling techniques, and data analysis procedures; assists with annual aquatic plant identification workshops)
 - Routinely provides lake reports to private individuals, lake associations, or outside researchers upon request
 - Works with collaborators on original management research projects related to invasive species ecology and management and the effects of land use on aquatic communities (University of Wisconsin, US Army Corps of Engineers)
 - Coordinates Eurasian watermilfoil research statewide and for case studies in various regions including Dane, Bayfield, and Vilas Counties
 - Co-leads semi-annual training workshops on aquatic macrophyte data collection and identification
 - Provides technical and taxonomic expertise to a variety of stakeholders on aquatic plant management and ecology
 - Serves on Wisconsin Lakes Technical Team
 - Serves on Wisconsin Lakes Monitoring Team
 - Serves on Wisconsin Aquatic Plant Management Technical Team
-

Timothy Parks

- Consulted on adding muskellunge PIT tag data to the Fisheries Management statewide database
- Participated in the review of the Species of Greatest Conservation Need list in support of the Wisconsin Wildlife Action Plan update
- Provided consultation to DNR Water Resources Bureau, Spooner to model long term trends of total phosphorous in Lac Courte Oreilles, Sawyer County
- Participated in the Red Cedar Watershed Conference at UW-Stout
- Initiated a collaborative effort with Dr. Jim Church at UW-Stout to describe cisco morphometric variation among several populations in Wisconsin
- Provided database management training to Minnesota Department of Natural Resources staff collaborating on a cisco distribution study
- Participated in the 2013 Coolwater Hatchery Production wrap up
- Participated in the St. Croix River Interagency fisheries meeting
- Provided statistical assistance to Pamela Toshner (NOR-WMS) with the Lake Health Initiative Customer Survey
- Met with Minnesota DNR staff to discuss initial results and development future work plans for an interstate project that will describe historical and current distribution of cisco across the region
- Visited the Osceola Hatchery and discussed the logistics of using the fish loader and trying to determine the optimal sample size for weight counts at Osceola during the April, 2014 harvest

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Consulted with the fish propagation staff at the Governor Thompson Fish Hatchery in Spooner, to determine the sampling statistics needed to estimate number of walleye or musky displaced by water in stocking trucks

Randy Piette

- Attended Upper Mississippi River Conservation Committee mussel technical section, mussel coordination team meeting
- Participated as a member of the non-Arthropod Invertebrate Species Team in order to update Species of Greatest Conservation Need in the 2015 Wisconsin Wildlife Action Plan
- Provided consultation on Lake Poygan breakwall project and possible impacts to freshwater mussels within the project area
- Provides consultation and field support on dozens of mussel-related projects and associated permits
- Serves on Fisheries Management Catfish team
- Serves as agency freshwater mussel expert, assisting with dozens Water Regulation and Zoning, and Department of Transportation permit reviews for rip-rap, stream crossings, etc, impact to mussel habitat, as well as consultation and support to Endangered Resources for state and federally listed species
- Assists Water Management staff with electrofishing and support to Fisheries Management staff as requested, particularly on projects requiring SCUBA support

Andrew Rypel

- Provided statewide analyses for Fisheries Management's Panfish Team focused on temporal patterns between 1944-2012 in bluegill, black crappie, and yellow perch maximum and average lengths
- Presented research updates to the Fisheries Management Board and Fisheries Management Panfish Team
- Participated in multiple meetings with Fisheries Management and university partners aimed at evaluating the current walleye management system for the Ceded Territory, and provided updates on analyses of alternative methods of predicting walleye populations when they are unknown, and incorporating walleye production in the analysis
- Participated in a collaborative meeting including representatives from WDNR Science Services, WDNR Fish Management, and Michigan State University to discuss their walleye population model and its utility in simulating different regulatory scenarios
- Participated in a interstate meeting on cisco with Minnesota fisheries researchers
- Provided a tech consult for the Statewide Angler Survey on WI-specific length percentiles of gamefish



Andrew Rypel presenting results of his statewide analysis of fisheries population trends at the 2014 Fisheries Management Biologist meeting.

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Participated in a meeting with Minnesota DNR and the Natural Resources Research Institute, University of Minnesota to discuss coldwater fish data exchange in support of climate change modeling efforts at the Natural Resources Research Institute
 - Met with Southern district fisheries managers and supervisors and Science Operations Center staff to discuss status and future of Lake Mendota biomanipulation project
 - Met with colleagues at the Center for Limnology to continue work on a food web model for Escanaba lake using Ecopath with Ecosim
-

Greg Sass

- Collaborator on bass-walleye research with colleagues from UW-Madison, UW-Stevens Point, USGS, and WDNR Science Services and Fish Management
- Led the collaborative effort a month representatives from WDNR Science Services, WDNR Fish Management, Great Lakes Indian Fish & Wildlife Commission and the tribes, and Michigan State University to develop and refine a walleye population model and its utility in simulating different regulatory scenarios for sustainable exploitation
- Participated in multiple (6+) meetings aimed at evaluating the current walleye management system for the Ceded Territory, and provided updates on analyses of alternative methods of predicting walleye populations when they are unknown, and incorporating walleye production in the analysis
- Participated in a Fisheries Management Walleye Team meeting to determine future stocking and evaluation plans for the Wisconsin Walleye Initiative
- Participated in a Sherman Lake 50% annual walleye exploitation meeting with Great Lakes Indian Fish & Wildlife Commission
- Participated in a Northern Highland American Legion State Forest Integrated Property Management Meeting at Trout Lake Station
- Led the implementation of Northern Highland Fishery Research Area non-lead tackle requirement (social survey, signage, interaction with bait shops, postcards to last year's anglers)
- Met with Dairyman's, Inc. to discuss proposed funding and fisheries research on the Dairyman's property in Boulder Junction
- Consulted with Jen Bergman, Justine Hasz, and Tom Meronek regarding the status of the Lake Petenwell and Castle Rock walleye populations
- Met with colleagues at the Center for Limnology to continue work on a food web model for Escanaba lake using Ecopath with Ecosim
- Met with Minnesota DNR staff to discuss initial results and development future work plans for an interstate project that will describe historical and current distribution of cisco across the region
- Led the fish booth at the UW-Madison Trout Lake Station annual open house
- Met with Tim Tobias and Steve Gilbert to discuss the status and management plan for lake trout in Palette Lake
- Led Trout Lake Station seminar at Escanaba Lake Field Station discussing its importance to research and fisheries management for the state of Wisconsin DNR
- Met with Wes Jahns (retired WDNR fisheries technician in Vilas County) to discuss lake trout management plans

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Participated in the removal of the Little Rock Lake curtains
- Met with Greg Matzke in Florence to discuss research on Ellwood Lake regarding the discontinuation of milfoil chemical treatments and the response of fish populations
- Led a field trip at the Escanaba Lake Research Station for Waupun high school biology students
- Participated in a Fish Age Task Group meeting at UW-Steven's Point
- Met with Dr. Roger Jones (former DePaul University mathematician) to provide real-world fisheries data for his current teaching lessons
- Served as a consultant to the Minnesota DNR and Barr Engineering on the installment of a sound-bubble-strobe light barrier to prevent range expansions of Asian carp in the Upper Mississippi River
- Advised UW grad students about fisheries projects
- Adjunct professor at UW-Steven's Point, University of Illinois, Western Illinois University, and Eastern Illinois University (advises five current graduate students and serves on 6 graduate committees)
- Honorary Fellow of UW-Madison Center for Limnology
- Presented annual training modules for Fish Management new employee orientation
- Served on Fisheries Management Walleye team
- Participant in the Wisconsin Fish Age Task Group
- Serves as an advisor on invasive Asian carp management in Wisconsin
- Presenter at Wisconsin Lakes Partnership annual Lakes Convention
- Served on graduate committees at the University of Illinois at Urbana-Champaign and the UW-Steven's Point -Coop Unit
- Participated in Schoolyard Long-Term Ecological Research out of the UW-Madison Trout Lake Station to teach 7th grade students about winter limnology

Kelly Wagner

- Participated on the Wisconsin Wildlife Action Plan working group to create a more detailed classification system for Wisconsin's inland lakes
- Participated as a member of the Botany Team for the Wisconsin Wildlife Action Plan Update through Natural Heritage Conservation update
- Conducted Science Services technical review of wetland project proposal
- Participated on the Boat and Gear Disinfection Team, working with some Water Quality Bureau and Fisheries staff to create updated guidelines for staff to follow to prevent Aquatic Invasive Species and fish pathogen movement from Department activities
- Met with Water Quality Bureau to discuss Aquatic Plant Management-related research products and communications and their availability to internal and external partners and the public
- Met with central office monitoring staff to discuss the use of macrophyte data in developing site-specific phosphorus criteria
- Acted as liaison between Water Quality Bureau Lakes Team and Science Services aquatic plant research team
- Co-led semi-annual training workshops on aquatic macrophyte data collection and identification

Teaming Up – Identifying Research Needs, Sharing Results, and Technical Consultation

- Designed and coordinated macrophyte field data collection and ecological studies
- Provided aquatic plant taxonomic assistance to a variety of stakeholders
- Provided rare plant data and maps to Natural Heritage Conservation for aquatic plant records encountered in Science Services work
- Provided technical expertise of aquatic plant sampling methods as requested to US Environmental Protection Agency and other state resource agencies
- Represented the Department and presents findings at scientific and academic conferences
- Worked with GIS team and Lakes team staff to collaborate on efforts to digitize and identify small waterbodies in Wisconsin
- Worked with Wisconsin Lakes Partnership to communicate research findings and collaborate on work relevant to WI lakes and aquatic macrophytes

Carl Watras

- Provided the plenary session at the Wisconsin Lakes Convention, Celebrating 3 decades of research at Little Rock Lake. Moderated by Glen Moberg, Wisconsin Public Radio
- Consulted with DNR Office of Communication staff on recent media event at Little Rock Lake (30 years of research)
- Consults with Air Management staff on issues related to mercury pollution and acid rain in Wisconsin
- Met with CO staff from the Water Division, regional staff, Vilas County, UW-Extension, and the North Lakeland Discovery Center for a day-long meeting at Trout Lake to plan a statewide lake level monitoring program for citizen scientists
- Provided guidance to the Water, Monitoring Section on wireless technologies that might be useful for monitoring wetland water tables in Penokee watersheds
- Initiated discussions with Groundwater and Monitoring staff to develop a proposal for expanding the wireless wetland observatory to include upland water tables
- Consulted with Northern District biologists and wetland specialists in Water on Penokee watersheds
- Advised two NGOs (North Lakeland Discover Center and Bad River Watershed Association) on citizen science grant opportunities
- Met with Water Quality and NOR Water Staff at the UW Trout Lake Station to discuss plans for expanding the citizen-based water level monitoring program statewide
- Consulted with northern district managers and Office of Great Lakes modelers on the St Louis River Estuary TMDL
- Contributes “Research Summary” annually for the Northern Highland American Legion State Forest Forestry Newsletter
- Consults with tribes on matters related to atmospheric contaminants
- Provides guidance and support to the North Lakeland Discovery Center and to the Last Wilderness Conservation Association in Vilas County
- Serves on the Center for Limnology outreach team
- Served as contributing editor for *Aquatic Ecology* and *Science of the Total Environment*

Research Projects

Research Projects

This section of our report highlights FY 13-14 research efforts by staff members working in the Fisheries and Aquatic Sciences Research Section. Brief project summaries describe each project and identify the lead scientist(s), collaborating scientists and agencies, and Wisconsin DNR and external customer programs. Projects are funded through a variety of sources, including state funds, federal Sport Fish Restoration funds, bureau-to-bureau contracts with partner programs, as well as external grants. Projects are listed according to the 2013-15 DNR Biennial Research Agenda themes and priority research focus areas (<http://dnr.wi.gov/files/PDF/ResearchAgenda2013-2015.pdf>). Many projects overlap, so each subsection does not necessarily reflect all pertinent research within that subdiscipline.

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
Manage & sustain ecosystems	Landscape dynamics	Using satellite remote sensing to develop predictive models of lake water clarity	Request of Water Quality Bureau - Lakes section	Monica Turner (UW-Madison), Steve Greb	Monitoring lake water clarity on an annual basis since 2003 through remote sensing. This project aims to use this long-term dataset to identify landscape drivers of water clarity and develop predictive models.
Manage & sustain ecosystems	Invasive species	Evaluation of potentially invasive aquatic species, including macrophytes, algae, and cyanobacteria: a literature review for the Governor's Council on Invasive Species	Request of Water Division for NR 40 development	Michelle Nault, Alison Mikulyuk, Jennifer Hauxwell, Martha Barton, Kelly Wagner, Gina LaLiberte, and Susan Knight	Key study for developing and updating Chapter NR40 (Invasive Species Identification, Classification, and Control). Extensive literature reviews were compiled on Wisconsin-specific threats posed by 36 aquatic invasive species in 2007 (NR 40 initial development and promulgation) and 42 species in 2012 (NR 40 update and revision). These reviews were used by the Governor's Council on Invasive Species stakeholder species assessment groups in developing recommendations for additional species to list under NR 40.
Manage & sustain ecosystems	Invasive species	Statewide evaluation of early season whole lake and small-scale herbicide applications for	Water Quality Bureau - Request of Water Quality Bureau Lakes	Michelle Nault, Martha Barton, Jennifer Hauxwell	Conduct water monitoring on herbicide applications in Wisconsin lakes and flowages in order to provide information regarding actual herbicide concentration and exposure time data

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
		determining effective management protocols for control of Eurasian watermilfoil and curly-leaf pondweed in lakes	Section	(Science Services), Scott Van Egeren, Scott Provost, Statewide Lake Coordinators (Water Division), US Army Corps of Engineers	for applications under a variety of operational conditions, and develop recommendations for improved control of invasive exotic aquatic plant species and reduced damage to native plant populations. Herbicide concentrations in the water were periodically collected post-treatment on a sub-sample of chemical treatments across the state. Samples were analyzed for 2,4-D and/or endoathall using enzyme-linked immunosorbent assay (ELISA) methods, and aquatic vegetation responses were monitoring using DNR's baseline monitoring methodology.
Manage & sustain ecosystems	Invasive species	Strategic long-term monitoring of lakes with Eurasian watermilfoil: effects of region and management	Water Quality Bureau - Request of Water Quality Bureau Lakes Section	Michelle Nault, Alison Mikulyuk, Martha Barton, Jennifer Hauxwell, Susan Knight	Evaluate the long term abundance and distribution of Eurasian water-milfoil (EWM) in a variety of lakes in Wisconsin. Results will allow us to understand the efficacy of management and how to best distribute the state's Aquatic Invasive Species grant funds. Twenty-four lakes were selected and surveyed annually to represent different ecoregions (north, central, south), EWM population levels (established or new), and management scenarios (best strategic management or no management).
Manage & sustain ecosystems	Invasive species	Technical assistance provided to assess the status of recently-discovered Eurasian watermilfoil populations in Wisconsin lakes	Water Quality Bureau - Request of Water Quality Bureau Lakes Section	Michelle Nault, Martha Barton, Alison Mikulyuk, and Jennifer Hauxwell (Science Services)	Conduct rapid response surveys and provide technical assistance for newly discovered Eurasian water-milfoil populations. Newly discovered populations are assessed using the baseline aquatic plant survey method and data is used to inform the development of rapid response management plans and grants.
Manage & sustain ecosystems	Invasive species	Efficacy of early spring harvesting or 2,4-D treatment as a	Water Quality Bureau - Request of Water Quality	Jennifer Hauxwell, Alison	This project is a partnership between DNR, Dane County, and the US Army Corps of Engineers to evaluate techniques to manage Eurasian

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
		management tool for Eurasian watermilfoil in southern Wisconsin lakes	Bureau Lakes Section	Mikulyuk, and Michelle Nault (Science Services), Tim Asplund, Sue Graham, Kurt Welke (Water Division), US Army Corps of Engineers	watermilfoil. Evaluate the effects of chemical treatment and mechanical harvesting on Eurasian water-milfoil and native plant populations. A repeated block design was employed in 5-acre plots on Turville Bay, Lake Monona, Dane County, in order to assess the differing management strategies on the frequency and density of aquatic macrophytes. Point-intercept and biomass data was collected bi-annually and compared to reference plots to allow us to assess the use of these approaches in managing EWM.
Manage & sustain ecosystems	Invasive species	Regulated aquatic plants in trade: assessing prevalence in trade and risk to Wisconsin waterbodies	Water Quality Bureau - Developed and submitted proposal at request of WD (Wakeman, Bode, Schaal)	Kelly Wagner, Jennifer Hauxwell, Alison Mikulyuk, Elizabeth Haber, Mindy Wilkinson, Chrystal Schreck (Science Services), Scott Van Egeren (Water Division)	Reduce the availability of invasive aquatic plants via the trade industry by determining where regulated species are sold, educating vendors through outreach, and determining barriers to change through social survey of vendors. Biological surveys of vendor stock before and after education will determine efficacy of education campaign, and surveys of 150 small waterbodies near retail sources will determine risk of species introductions on the landscape.
Manage & sustain ecosystems	Invasive species	Spiny water flea and zebra mussel veliger laboratory service	Request of Water Quality Bureau	Paul Garrison, Gina LaLiberte, Caitlin Carlson	Process 800-1300 plankton samples as part of Water Quality Bureau-led GLRI project on aquatic invasive species.
Manage & sustain ecosystems	Great Lakes	Evaluation in Wisconsin's Lake Michigan Areas of Concern	Request of Office of Great Lakes	Paul Garrison	Analyze benthic invertebrate and plankton communities in Wisconsin's four Lake Michigan Areas of Concern (AOCs; Menominee River, Lower Green Bay and Fox River, Sheboygan

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
					River, and Milwaukee Estuary). Collect data on AOC sites and closely related non-AOC sites to allow comparison of AOC sites to relatively-unimpacted or less-impacted control sites with similar physical and chemical characteristics.
Manage & sustain ecosystems	Great Lakes	<i>Cladophora</i> and water quality of Lake Michigan: a systematic survey of Wisconsin nearshore areas	Request of Office of Great Lakes	Steve Greb, Paul Garrison	Implement a monitoring program to observe the density, distribution, and associated water quality impacts of <i>Cladophora</i> along Wisconsin's Lake Michigan shoreline. Continuing investigation designed to test sampling techniques and assist with developing long-term monitoring plans and research needs, as well as identifying short-term beach clean-up and odor mitigation options, and addressing public information needs.
Manage & sustain ecosystems	Great Lakes	Nearshore monitoring site - Kewaunee station	Request of Office of Great Lakes	Steve Greb	Deploy in situ sensor and track water quality parameters at a Lake Michigan nearshore station. This system complements 2 other units deployed by UW-Milwaukee School of Freshwater Science.
Manage & sustain ecosystems	Great Lakes	Evaluation of Areas of Concern (AOCs) using satellite remote sensing - a pilot study	Request of Office of Great Lakes	Steve Greb	Although a substantial amount of water quality data exists for the AOC, comprehensive data sets are often not available. As such, multiple lines of evidence have to be employed to help determine whether a BUI should be removed or persist after remediation efforts have been completed. This projects investigates new methodologies to obtain spatially uniform, systematic water quality measurements across Wisconsin's AOCs. There are a variety of satellites in orbit that present different capabilities (spatial and spectral resolution, and temporal passover). The purpose of this project is to

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
					explore the use of two satellite sensors in the evaluation of water quality parameters of interest with respect to AOCs. The sensors to be evaluated are WorldView-2, a high resolution commercial satellite and NASA's Landsat 7.
Manage & sustain ecosystems	Groundwater, drinking water & water use	Characterizing the sources of elevated groundwater nitrate in Dane County, WI	DG Bureau - see also Research agenda Appendix list of Water Quality/ Watershed priorities	Cory McDonald, Dick Lathrop	The goal of this project is to elucidate spatial and temporal trends in groundwater nitrate contamination in Dane County and to identify the drivers of these trends. Specific objectives are to: 1. Develop accurate, time-resolved maps of nitrate concentrations in the shallow aquifer of Dane County and identify localized areas of the county where nitrate concentrations are consistently high or low, as well as areas where concentrations are increasing or decreasing over time, 2. Develop an empirical model of nitrate concentration as a function of hydrological parameters (groundwater flow and residence time, location in the aquifer), soil characteristics, and land use that can be applied from well- to basin-scales, and 3. Run model scenarios to explore the potential for conservation measures, etc. to reduce regional groundwater nitrate concentrations in the future.
Manage & sustain ecosystems	Inland lakes, rivers, streams & wetlands	Citizen monitoring to ground-truth satellite remote sensing data on lake water quality	Water Quality Bureau - Request of Water Quality Bureau Lakes and Monitoring Sections	Steve Greb	Citizens collect in situ data in lakes to ground-truth data from satellites.
Manage & sustain ecosystems	Inland lakes, rivers, streams & wetlands	Lake temperature study	Water Quality Bureau - Monitoring and Lakes Sections	Dick Lathrop	Evaluate long term patterns in lake temperatures for a variety of resource management applications.

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
Manage & sustain ecosystems	Dam removal & fish passage	Evaluation of Prairie du Sac Dam fish passage project	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Fisheries Assessment Objectives for Fisheries Research; Water Reg and Zoning	John Lyons	Provide scientific leadership in the design and evaluation of a proposed upstream passage facility and to determine if it is successful in re-establishing extirpated species above the dam and improving fisheries. The installation of upstream and downstream fish passage through the dam in would be the largest project of its kind in the Midwest, with an unprecedented opportunity to learn how to better reconnect fragmented river systems and restore their fisheries.
Manage & sustain ecosystems	Dam removal & fish passage	Great Lakes Basin aquatic connectivity assessment	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Fisheries Assessment Objectives for Fisheries Research	Matt Diebel	Cost-benefit approach to maximizing gains in fish passage across the Great Lakes basin while minimizing negative effects of aquatic invasive species. Develop infrastructure for collection, storage, and analysis of barrier data across the Great Lakes Basin. Develop a volunteer monitoring program for evaluating fish passage at road crossings. Provide specific guidance for restoration at scales from individual watersheds to the entire basin, refine methodologies for spatial analysis of barriers, and provide a systematic framework for comparing costs (direct economic costs, species invasions) and benefits (connectivity, focal fish species) of barrier removal. Utilize spatial data on the location and attributes of barriers (dams and road-stream crossings) and fish breeding habitat throughout the Great Lakes basin to analyze the optimum strategy for enhancing connectivity and restoring fish migrations.

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
Manage & sustain ecosystems	Dam removal & fish passage	Northern pike spawning habitat connectivity	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Fisheries Assessment Objectives for Fisheries Research	Matt Diebel	Guide the restoration of stream connectivity by identifying the most significant fish migration barriers in the Green Bay watershed. These results will provide a quantitative basis for prioritizing barrier removal and tracking the progress of connectivity restoration. Utilize a GIS-based analytical approach that bases the value of barrier removal on both the amount and quality of reconnected habitat. The results of this project will include a detailed map of habitat suitability and accessibility for northern pike and stream-resident species and a list of barriers ranked on connectivity effect.
Manage & sustain populations	Sustainable fisheries	Ceded Territory Walleye Sustainable Harvest Modeling / The effects of exploitation on northern walleye populations	Fisheries Management 2011-2014 Tier 1 Research Priority	Greg Sass, Andrew Rypel, Gretchen Hansen, Michigan State University researchers, Fisheries Management	Key study for setting sustainable walleye harvest goals. Statistical modeling using all available and appropriate Ceded Territory walleye data and conduct walleye population assessments in northern WI lakes. Build a statistical catch-at-age model to test for exploitation rates in a mixed fishery (including tribal pulse fishing) (35%, 50%, 75%, 90%) that lead to long-term walleye sustainability by varying compensatory recruitment responses and initial adult walleye densities. Independent of the first model, we will test various recreational harvest regulations, tribal exploitation rates, and various angler effort and behaviors; an emergent property of this model will be sustainable exploitation rates under the various scenarios.
Manage & sustain populations	Sustainable fisheries	Modeling bass-walleye population dynamics in northern Wisconsin lakes	Fisheries Management 2010-2014 Tier 1 Research Priority	Gretchen Hansen, Greg Sass, Andrew Rypel, UW-Madison, UW-	Key study for implementing the Wisconsin Walleye Initiative. Document current abundance and distributions of walleye and bass and model factors to predict future abundance and distribution. Develop ecological-simulation

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
				Steven's Point, Fisheries Management	computer models that allow managers to examine how bass and walleye interact, particularly in terms of how they may prey on each other, compete for food and space, and respond differently to environmental changes such as warmer temperatures, lower lake levels, different plant communities, and changes in shoreline land use. Models will be used to explore how various fisheries management actions (e.g., regulation changes, stocking, habitat enhancement) might be used to favor one species or the other.
Manage & sustain populations	Sustainable fisheries	Hatchery and Fisheries Management support services	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Propagation Program Objectives for Fisheries Research	Jeff Kampa	Provide study consultation and conduct studies to inform science-based operational planning in the Fish Management Propagation program. Refinement of some standard hatchery practices to reduce stress and improve condition of stocked fish, as well as adapt to meet unforeseen challenges (e.g. new diseases) in the statewide production program. Document oxytetracycline (OTC) mark efficacy, implement lab quality control procedures and maintain lab equipment at the Governor Tommy Thompson State Fish Hatchery to support Fish Management stocking evaluations.
Manage & sustain populations	Sustainable fisheries	Muskellunge growth characteristics	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Muskellunge Program	Jeff Kampa	Develop better documentation of age and growth characteristics in premier muskellunge fisheries, with an objective of setting realistic goals based on limnology, fish community, and angling pressure. Evaluate new approaches to user group participation in research, with local guides and anglers reporting data from tagged muskellunge. Monitor population age structure, and validate age and growth of muskellunge in

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
			Objectives for Fisheries Research		Wisconsin. Provide information on stocked year class strength and contribution of propagation program to muskellunge fisheries. Assess impact of catch and release fishing on mortality and size structure. Evaluate accuracy of current population estimation methods. Collect limnological data and improve understanding of relations between angling pressure, capture probability, hooking mortality, and growth.
Manage & sustain populations	Sustainable fisheries	Cisco assessment and walleye-cisco interactions in Wisconsin lakes	Fisheries research serves Water Division Fisheries Management Bureau; also serves Water Quality Bureau for site-specific phosphorus criteria development	Jeff Kampa, John Lyons, Greg Sass	This project is surveying Wisconsin lakes with historical records of cisco (<i>Coregonus artedii</i>) populations (key forage for walleye and muskellunge) to assess current distribution. A subset of lakes will be monitored, and relations between cisco and gamefish will be modeled. Sampling will consist of variable mesh size vertical gillnets and hydroacoustics. This project is part of a tri-state effort to understand the relationship between cisco abundance and temperature and land use on as well as resulting impacts on walleye.
Manage & sustain populations	Sustainable fisheries	Long-term viability of source populations of wild brook trout and brown trout for Wisconsin's wild trout stocking program	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Trout Program Objectives for Fisheries Research	Matthew Mitro	This study investigates the long-term viability of wild brook trout and brown trout populations as source populations for Wisconsin's wild trout stocking program. Develop a quantitative understanding of the long-term viability of wild brook trout and brown trout populations as source populations for Wisconsin's wild trout stocking program. This study will enable science-based management decisions that will work to ensure the long-term viability of a successful program.

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
Manage & sustain populations	Sustainable fisheries	Monitoring temporal trends in trout populations and base flow in streams	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Trout Program Objectives for Fisheries Research	Matthew Mitro	Key study for developing the Driftless Area Master Plan. Understand the role of stream flow (base flow and extreme flow events) and stream temperature in trout population dynamics. Trout population response to stream flow will assist in determining appropriate minimum flows and in identifying risks to trout populations associated with changing land use, groundwater use, precipitation, and temperature. Also received grant to track gill lice.
Manage & sustain populations	Sustainable fisheries	Restoration of a brook trout fishery in Tenny Spring Creek using an artificial barrier	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Trout Program Objectives for Fisheries Research	Matthew Mitro	Investigate the effect of stream habitat restoration on brook trout and brown trout populations in order to guide future trout stream restorations. This study also evaluates how trout age structure and abundance varies among restoration sites, the role that environmental conditions and recruitment play in restoration success, and the implications for future monitoring of stream habitat development projects and the setting of recovery expectations.
Manage & sustain populations	Sustainable fisheries	Effects of known exploitation rates on trout population dynamics	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Trout Program Objectives for Fisheries Research	Matthew Mitro	This study will investigate the effects of a known exploitation rate on a brown trout population in Trout Creek. Specific objectives include quantifying the effects of a known exploitation level of trout under a maximum size limit on trout population abundance, size structure, recruitment, growth, and mortality.

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
Manage & sustain populations	Sustainable fisheries	Center for the Study of Fish Age and Growth	Fisheries Management Bureau initiative	Matthew Mitro	Provide research support toward implementing the Wisconsin Fisheries Analysis Center—a cooperative effort between UW-Stevens Point faculty and WDNR research scientists and managers—which will provide three broad services of value to fisheries management in Wisconsin: 1) Analysis of fish population dynamics and quantitative fishery science metrics used by WDNR fisheries biologists and technicians in response to natural variation, management intervention, or human induced environmental change within Wisconsin and the region; 2) Quality assurance and quality control systems for fish age estimation; and 3) Technical training (seminars and short courses) for state fisheries professionals and technical staff (provided on a cost per trainee basis), and graduate students, including the development of distance education and certification programs that would increase accessibility for agency professional staff.
Manage & sustain populations	Sustainable fisheries	Lake sturgeon distribution, movement, and stocking success in the Upper St. Croix River and Namekagon River	serves Fisheries Management Bureau	Jeff Kampa	Estimate lake sturgeon population size from the confluence of the St. Croix River and Namekagon River upstream to the first barrier in both river systems. In cooperation with WDNR and MDNR Fish Management staff, document lake sturgeon movement throughout the upper St. Croix River system in Wisconsin and Minnesota. Assess the performance of lake sturgeon stocked above movement barriers in the St. Croix River and Namekagon River.
Manage & sustain populations	Sustainable fisheries	Characterizing thermal regimes of coolwater walleye in the warm	serves Water Division	Brian Weigel/Justin Haglund	Characterize the thermal regime of the lower Wisconsin River and how it may affect walleye movement and survival. Collect data on 1) the

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
		Lower Wisconsin River			summer maximum water temperature, 2) the water temperatures inhabited by walleye throughout the summer, with special emphasis during peak summer temperatures, and 3) identify thermal refugia used by walleye.
Manage & sustain populations	Sustainable fisheries	Predicted effects of temperature and precipitation on Wisconsin stream fishes	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Fisheries Assessment Objectives for Fisheries Research	John Lyons, Matthew Mitro	Key study for developing the Driftless Area Master Plan. Improve the sensitivity of an existing GIS-based, watershed-scale model that predicts stream suitability for 50 fish species to variation in climate and groundwater flows by developing a hydrologic model to link changes in air temperature and precipitation to changes in water temperature and stream flow. Use the improved model to predict how various temperature and precipitation scenarios will alter the distribution and abundance of Wisconsin stream fishes. Predict the response of stream fishes to Wisconsin-specific projections over the next 25-50 years and identify streams particularly vulnerable to guide management planning.
Manage & sustain populations	Sustainable fisheries	Fish response to hydrologic modification	Request of Bureau of Drinking Water and Groundwater	Matt Diebel	Flow regime is a primary determinant of the structure and function of aquatic and riparian ecosystems for streams and rivers. Our scientists and various collaborators are working to understand how stream flow affects fish communities. Areas of focus - Dane County and Statewide. Evaluate relationships between stream fish species distributions and hydrologic metrics, including low and storm flows. These relationships will then be used to predict changes in fish assemblages that would result from hydrologic modification from groundwater withdrawals and increases in impervious surfaces.

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
Manage & sustain populations	Sustainable fisheries	Fisheries-based lakes classification	Request of Fisheries Management - top tier priority FY14	Andrew Rypel	This project will link fisheries biological information with limnological data to classify lakes according to the fisheries they support. To be used as a tool for fish biologists and the public in setting realistic management goals on individual water bodies.
Manage & sustain populations	Sustainable fisheries	Statewide panfish research	Request of Fisheries Management - top tier priority FY14	Andrew Rypel	This project provides long term trends in panfish and other species. Data used in statewide information sessions by Fisheries Management to guide a revision of the statewide panfish management plan.
Manage & sustain populations	Sustainable fisheries	A regional decision support tool for identifying vulnerabilities of riverine habitat and fishes to temperature and precipitation	Fisheries Management Bureau	John Lyons	This project provides data across the Upper Midwest on stream fisheries under various temperature and precipitation scenarios.
Manage & sustain populations	Nongame species	Status of snuffbox mussel in the Wolf River System	Request of Natural Heritage Conservation	Randal Piette, Bill Smith and Lisie Kitchel (Endangered Resources)	Determine distribution and abundance of federally endangered species in Wolf River System. Define key habitat requirements and determine feasibility of management strategies.
Manage & sustain populations	Nongame species	Research support to Water Quality, Watershed, Natural Heritage Conservation Bureaus, Office of Energy and Environmental Analysis - Evaluating freshwater mussel populations	Request of Water Reg and Zoning, Natural Heritage Conservation, and Office of Energy	Randal Piette	Mussel surveys are required for a variety of reasons including water resources permitting and dam relicensing. Science Services provides technical expertise in mussel taxonomy and survey work. Provides advice and assistance to Fisheries Management and Water Quality staff and DNR's Department of Transportation liaisons in determining impacts of project permits on mussel communities.
Manage & sustain populations	Fish, wildlife, & plant genetics	Conservation genetics of WI Fishes	Fisheries Management Bureau - see	Brian Sloss (UW-Stevens Point)	Apply the principles of conservation genetics to protecting and enhancing Wisconsin's fisheries. Currently funding a graduate student and

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
			Fisheries Management Strategic Plan 2007-13 - Walleye Program Objectives for Fisheries Research		academic staff genetics laboratory manager through Dr. Sloss's lab at UW-Steven's Point (Wisconsin's Fisheries Cooperative Unit) focused on gamefish genetics.
Pollutants & human health	Nutrient impacts to surface water and groundwater	Long term trends in the water quality of Wisconsin rivers	Request of Water Division	Matt Diebel	Evaluate trends over time in selected water quality parameters on Wisconsin rivers. Results of 42 sites on Wisconsin rivers will provide an overall picture of how water quality has changed over the last 30-50 years and factors associated with trends including agricultural and urban land management practices and wastewater discharges.
Pollutants & human health	Nutrient impacts to surface water and groundwater	Phosphorus and nitrogen in Lake Mendota's tributary streams and shallow groundwater systems: Trends and linkages to agriculture (comp project)	serves Water Division	Dick Lathrop	Conduct monitoring in the Yahara tributaries for N and P. Conduct a sub-project as part of Yahara CLEAN to analyze long-term P loading and lake response data that would allow specific P loading reduction targets to be recommended and if achieved would produce measureable water quality benefits for the four Yahara lakes. The analyses were completed and a final report written in December 2011. The results and recommendations of that work have been foundational to new lake clean-up efforts by Yahara CLEAN partners and Clean Lakes Alliance, a local non-profit group.
Pollutants & human health	Nutrient impacts to surface water and	Devils Lake responses to 10 years of bottom water withdrawals	serves Water Division	Dick Lathrop	To install and analyze a bottom-water withdrawal system to remove excess internal recycling of P from the lake, and return the lake to a lower trophic state. The 5,500-foot long withdrawal

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
	groundwater				pipe system was installed in 2002 and continued evaluation the lake's water quality responses to the repeated withdrawals of P-rich water is ongoing.
Pollutants & human health	Nutrient impacts to surface water and groundwater	Exploring the influence of wetlands on nutrients in the Lower Yahara Lakes	Water Quality Bureau - Lakes section and Southern District staff	Cory McDonald	The overall objective of this project is to define the role of Upper Mud Lake in moderating the movement of nutrients (from both upstream and watershed sources) through the Yahara chain of lakes. The retention and/or release of nutrients from this system must be known if the efficacy of best management practices for nutrient reduction in the watershed is to be evaluated for downstream nutrient reductions. This project will develop a seasonally-resolved nutrient budget for Upper Mud Lake, and test the potential for this wetland-rich system to act as alternately as a source and sink for nutrients.
Pollutants & human health	Mining impacts	Taconite iron mining in Wisconsin - a review	Bureau of Water Quality list of priority research needs	Cory McDonald, Science Services researchers, Water Quality, Air and Waste	Coordinate an interagency team including Water Quality and Air and Waste to draft an overview of taconite mining in Wisconsin. Provide research and technical consultation to Water Division staff in developing recommendations for list of parameters and spatial and temporal monitoring design for mining applications.
Pollutants & human health	Harmful blue-green algae	Coordination of blue-green algae statewide monitoring	Request from Water Quality Bureau Lakes and Monitoring sections	Gina LaLiberte	Coordinate agency's response and follow-up monitoring of blooms of blue-green algae. Work cooperatively with the Department of Health Services and Wisconsin State Laboratory of Hygiene.
Pollutants & human health	Fish & wildlife contaminants	Sentinel lakes – tracking long-term trends in acid rain and mercury	Serves Water Division and AWaRe Division Bureau of Air Management	Carl Watras	As part of the Northern Wisconsin Long Term Ecological Research Program, a number of lakes are routinely monitored for a number of parameters - represents a partnership with UW. This project has yielded key information for use

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
					in establishing scientific information for mercury and acid rain. The project is the foundation for other projects including fisheries consumption advisories.
Pollutants & human health	Biological criteria & designated uses	Development and evaluation of watershed models for predicting stream fishery potential	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Fisheries Assessment Objectives for Fisheries Research	John Lyons, Matthew Mitro	This study is key for Fisheries Management and also for Water Quality Bureau's Bioassessment reporting for Environmental Protection Agency. Develop computer models that use readily available, watershed-scale, GIS-based information to predict flows, water temperatures, and suitability for 50 fish species in all 55,000+ miles of streams and rivers in Wisconsin. Utilize these models to assess, map, and classify the current status of stream fisheries in the state and will provide tools for managers to determine stream potential and to effects of land-use, temperature, and precipitation on stream fisheries.
Pollutants & human health	Biological criteria & designated uses	Assessing drivers of variability in the chlorophyll phosphorus relationship in Wisconsin lakes	Request of Water Quality Bureau	Matt Diebel, Cory McDonald	This project is important for developing site-specific phosphorus criteria. Better understand what caused outliers in the redevelopment of the P-Chl relationship for WI lakes. Assess drivers of variation in the phosphorus/chlorophyll relationship in shallow lakes.
Pollutants & human health	Biological criteria & designated uses	Developing an aquatic macrophyte-based bioassessment tool	Water Quality Bureau - Request of Water Quality Bureau Lakes Section	Kelly Wagner, Scott Van Egeren, Alison Mikulyuk, Michelle Nault, Jennifer Hauxwell	Develop a macrophyte-based bioassessment tool and indicator of environmental quality. Utilize a database of standardized aquatic plant surveys conducted on 266 Wisconsin lakes.
Pollutants & human health	Biological criteria & designated	Service to lake associations - nutrient management studies -	Request of lake association and regional Water	Paul Garrison	Science Services provides research support to various lake groups evaluating water quality. Paleolimnological techniques provide information

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
	uses	Anvil Lake, Big Moon Lake	Quality Bureau staff		on past water quality which assists in setting reasonable goals for future water quality conditions. Use diatoms, geochemistry, and sediment accumulation to assess water quality status of lake and compare to historical conditions.
Pollutants & human health	Baseline assessment & monitoring	U.S. Environmental Protection Agency National Lake Assessment	Request from Water Division to design and implement US Environmental Protection Agency National Lakes Assessment	Paul Garrison	This project is part of a national program to assess the condition of the Nation's lakes. Indicators and stressors that are being evaluated are nutrients, algal toxin, water chemistry, sediment mercury and diatoms, phytoplankton, zooplankton, shoreland habitat, benthic macroinvertebrate community, and macrophytes.
Pollutants & human health	Baseline assessment & monitoring	U.S. Environmental Protection Agency National Lakes Assessment Design Support - Developing a rapid assessment protocol for macrophytes	Water Quality Bureau - Request of Water Quality Bureau Lakes Section	Alison Mikulyuk, Kelly Wagner, Michelle Nault, Martha Barton, Jennifer Hauxwell	Developed a transect method to quickly screen macrophyte communities which will be compared against the current baseline protocol to determine its suitability as a Tier I monitoring protocol for macrophytes.
Pollutants & human health	Baseline assessment & monitoring	The use of satellite remote sensing for monitoring Wisconsin lakes	Request of Water Quality Bureau - Lakes section	Steve Greb, Eric Erdmann	Science Services provides support to Water Quality Bureau for WDNR's baseline monitoring program with a focus on statewide assessments of lake water clarity using satellite imagery. Utilization of remote sensing as a cost-effective alternative to traditional in-situ monitoring methods. This technique provides spatial coverage ranging in scale from with-in lake variation to statewide coverage.
Pollutants & human health	Baseline assessment & monitoring	Remote Sensing Research Scientist	Funded Budget Initiative	Steve Greb, Daniela Gurlin	Remote sensing, particularly the use of satellites, has emerged as a cost-effective method for a variety of environmental monitoring applications.

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
					Examples of remote sensing uses include forest ecosystem health, forest fire monitoring, land use changes and land cover changes, such as percent imperiousness. One of the most important advantages remote sensing has over conventional monitoring is cost savings. This position will provide scientific leadership in assessing the variety of remote sensing options and applications and implementing a cost-effective approach to lake monitoring.
Pollutants & human health	Baseline assessment & monitoring	U.S. Environmental Protection Agency National Rivers and Streams Assessment	Request from Water Quality Bureau Monitoring section	Paul Garrison, Gina LaLiberte	Inform nutrient and runoff management decisions, as well as listing/delisting of impaired waters. Rivers and streams periphyton soft algae and diatoms will be used to assess nutrients and biological integrity.
Pollutants & human health	Baseline assessment & monitoring	Citizen based monitoring – developing a user-friendly protocol to track lake levels and water tables across Vilas County	Serves Water Division and Division of Land's Bureau of Natural Heritage Conservation	Carl Watras	Develop standardized protocols that citizens may use to monitor lake levels across Vilas County. Volunteers currently monitor weekly ice-out to ice-on water level fluctuations in 26 Vilas County lakes, and compiled data are being incorporated into the SWIMS database by Lake Management staff.
Social & economic values	Customer satisfaction & behavior	Statewide angler mail creel survey	Request of Fisheries Management - top tier priority FY14	Matthew Mitro	This is a key study, typically conducted on a 5-year cycle to determine statewide patterns in fishing preference, catch, and many other variables.
Ensure solid science foundation	Long-term monitoring & foundational science	Rewrite the book <i>Fishes of Wisconsin</i>	Serves Water Division, Natural Heritage Conservation	John Lyons	Summarize the extensive and rapidly increasing new information on all 165 species of fishes in Wisconsin that has become available since the standard reference work <i>Fishes of Wisconsin</i> was published in 1983. The project will provide improved interpretation and access to information essential to the conservation and

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
					management of fisheries and aquatic resources in Wisconsin. Make both the new and older information accessible through innovative online applications, including a photo-based fish identification system, a customizable distribution-mapping tool, a comprehensive searchable bibliography, and an updatable “e-book” of species accounts.
Ensure solid science foundation	Long-term monitoring & foundational science	Northern Highland Fishery Research Area population and harvest monitoring	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Walleye Program Objectives for Fisheries Research	Greg Sass	Key study for implementing the Wisconsin Walleye Initiative. Continue to collect fisheries assessment and limnological data, as well as angler data to add to the valuable and extensive Northern Highland Fishery Research Area database, in order to provide information that will address a number of high priority issues that were identified by the Joint federal-state-tribal Assessment Steering Committee. Maintain the long-term Northern Highland Fishery Research Area database and to continually monitor fishing pressure, angler characteristics, and fish populations through a compulsory creel census and fish population sampling. The Northern Highland Fishery Research Area was established by the Wisconsin Department of Natural Resources (then the Wisconsin Conservation Commission) in 1946 to study the effects of angling on fish populations. There are five lakes in the Northern Highland Fishery Research Area which have been continuously managed as experimental research waters including Escanaba (293 acres), Nebish (98 acres), Palette (176 acres), Spruce (16.5 acres), and Mystery (16 acres). These lakes were chosen for research because they were typical of the

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
					different types of lakes in northeastern Wisconsin and because their location favored control of anglers by a compulsory permit system.
Ensure solid science foundation	Long-term monitoring & foundational science	Status and trends in sportfish populations of southwestern Wisconsin warmwater streams	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Fisheries Assessment Objectives for Fisheries Research	John Lyons	Document the responses of smallmouth bass to nutrient runoff, to floods and droughts. Provide data and interpretation to improve the conservation and management of a unique and valuable type of stream fishery. Monitor sportfish abundance, reproductive success, size structure, and growth rate each year in seven streams in southwestern Wisconsin that support (or once supported) high quality fisheries, continuing annual survey since 1989.
Ensure solid science foundation	Long-term monitoring & foundational science	Status and trends in the fish community of the lower Wisconsin River	Fisheries Management Bureau - see Fisheries Management Strategic Plan 2007-13 - Fisheries Assessment Objectives for Fisheries Research; Water Reg and Zoning	John Lyons	Provide data and interpretation to improve conservation and management of one of the most important fisheries in the state (Wisconsin River). Monitor long-term fish community dynamics each year over the entire Lower Wisconsin River. Evaluate sportfish abundance, reproductive success, size structure, and growth rate each year for the Prairie du Sac Dam tailwater, continuing annual surveys begun in 1987.
Ensure solid science foundation	Long-term monitoring & foundational science	Historic and future flows of Wisconsin rivers and associated impacts on river island resources	Serves Water Division	Steve Greb	Determine how the flows of Wisconsin's major rivers are changing over time and how these hydrologic changes might impact river channel and island shape and size. In recent past, Wisconsin has experienced both record flooding and record drought conditions, resulting in

Research Projects

PROJECT THEME	PRIORITY FOCUS AREA	PROJECT TITLE	PARTNER	LEAD RESEARCHER	PROJECT DESCRIPTION & OBJECTIVES
					dramatic swings in the flow of water in Wisconsin rivers. Changes in river flow have major effects on fisheries (\$2.75 billion industry supporting 30,000 jobs in WI), navigation, water quality, recreational safety (boating, camping, etc.), and diversity of species found on islands. We have partnered with the Department of the Interior's Bureau of Land Management to conduct work to better understand river hydrology in Wisconsin as well as to inventory the lands associated with riverine islands. Wisconsin has thousands of river miles and over 400 river islands.
Ensure solid science foundation	Long-term monitoring & foundational science	Developing wireless radio-sensor networks to monitor effects of temperature and precipitation on lakes and wetlands	Serves Water Division	Carl Watras	Understand how temperature and precipitation affect basic biogeochemistry of lakes and wetlands. Biogeochemistry affects everything from water clarity to fisheries. Each network of sensors can monitor water table fluctuations, precipitation, evaporation, dissolved organic carbon and bulk ionic solutes at 30 minute intervals throughout the ice-free season. The data are transmitted via low-power radio to a remote base station that is affiliated with UW-Madison GLEON project.
Ensure solid science foundation	Long-term monitoring & foundational science	Lake level fluctuations in the Northern Highland Lake District of Wisconsin: historical and current patterns	Serves Water Division	Carl Watras	Understand the regional water cycle and linkages between lake levels and temperature and precipitation. Records of lake stage, water table elevation, precipitation and evaporation are being investigated.

Research Publications

Research Publications

Fisheries and Aquatic Sciences Research staff routinely publish the results of their work in technical reports and peer-reviewed journals, serials, monographs, and books produced by scientific societies and other publishers. They also make their findings available to people who make and influence decisions about natural resources and environmental management through internal reports, impact assessment and guidance documents, brochures, fact sheets, and informational leaflets. There were a total of 140 publications - 68 were in peer-reviewed journals, 43 in various reports and DNR publications, 11 books or book chapters, and 18 in various online publications, popular magazines and other outlets. Publications appearing in print from July 2012 through June 2014 are listed below.

2014

- Bruckerhoff, L., J. E. Havel, S. E. Knight. In review. Survival of invasive aquatic plants after air exposure and implications for dispersal by recreational boats. *Hydrobiologia*.
- Diebel, M. W., M. Fedora, S. Cogswell, and J. R. O'Hanley. Submitted. Effects of road crossings on habitat connectivity for stream-resident fish. *River Research and Applications*.
- Diebel, M., A. Ruesch, D. Menuz. April 2014. Ecological limits of hydrologic alteration in Wisconsin streams. Project report to the Bureau of Drinking Water and Groundwater.
- Fayram, A. H., B. M. Weigel, J. Lyons & T. Simmons. 2014. Evaluating impairment in Wisconsin Areas of Concern using relative abundance of smallmouth bass. *Aquatic Ecosystem Health & Management* 17(2): 107-114. Link to this article: <http://dx.doi.org/10.1080/14634988.2014.904133>.
- Gaeta, J. W., T. R. Hrabik, G. G. Sass, B. M. Roth, S. J. Gilbert, and M. J. Vander Zanden. 2014. A whole lake experiment to control invasive rainbow smelt via overfishing and food web manipulation. *Hydrobiologia*. DOI 10.1007/s10750-014-1916-3
- Gaeta, J. W., G. G. Sass, and S. R. Carpenter. 2014. Drought-driven lake level loss: effects on coarse woody habitat and fish. *Canadian Journal of Fisheries and Aquatic Sciences* 71:1-11. DOI:dx.doi.org/10.1139/cjfas-2013-0451 (Editor's Choice Article for 2014).
- Garrison, P.J. 2014. Results of sediment core taken from Big Doctor Lake, Burnett County, Final Report, Wisconsin. 8 pp.
- Garrison, P.J. 2014. Results of sediment core taken from Black Oak Lake, Vilas County, Wisconsin: fossil diatom and zooplankton communities. 8pp.
- Greb, S. R. 2014. The GEOSS water strategy-from observations to decisions. Chapter 6. Existing and Planned Observational Systems for Priority Water Quality Variables. R. Lawford, editor. JAXA press.
- Grol, M. G. G., A. L. Rypel, and I. Nagelkerken. 2014. Growth potential and predation risk drive ontogenetic shifts among nursery habitats in a coral reef fish. *Marine Ecology Progress Series* 502: 229-244.
- Gyawali, R., R. O'Connor, K. Doyle, C. Noll, and S. Greb. In Review. Analysis of seasonal streamflow changes and apportionment of changes to climate and land use in Wisconsin watersheds. *Journal of American Water Resources Association (JAWRA)*.

Research Publications

- Hansen, G. J. A. and C. C. Carey. In review. Fish and phytoplankton exhibit contrasting temporal species abundance patterns in a dynamic north temperate lake. PLOS ONE.
- Hansen, G. J. A., J. W. Gaeta, J. F. Hansen, and S. R. Carpenter. 2014. Learning to manage and managing to learn: sustaining freshwater recreational fisheries in a changing environment. Fisheries. Accepted.
- Hansen, J. F., G. G. Sass, J. W. Gaeta, G. J. A. Hansen, D. A. Isermann, J. Lyons, and M. J. Vander Zanden. In press. Largemouth bass management in Wisconsin: intra-and inter-specific implications of abundance increases. In W. Pine, ed. Black Bass Diversity: Multidisciplinary Science for Conservation. American Fisheries Society, Bethesda, MD.
- Hansen, G. J. A., J. M. Hennessy, T. Cichosz, and S. W. Hewett. 2014. Predicting walleye abundance in northern Wisconsin lakes using mixed effects models with a linear time trend. Draft WDNR management report.
- Hansen, G. J. A., S. Sadro, M. M. Baustian, B. A. Stauffer. 2014. Is it time to redefine the “alternative” career path for ecologists? Limnology and Oceanography Bulletin 23:2-5.
- Hanson, P. C., I. Buffam, J. A. Rusak, E. H. Stanley and C. Watras. 2014. Quantifying lake allochthonous organic carbon budgets using a simple equilibrium model. Limnology and Oceanography 59(1):167-181.
- Januchowski-Hartley, S., M. Diebel, P. Doran, P. McIntyre. In press. Predicting road culvert passability for migratory fishes. Diversity and Distributions.
- Jennings, M., G. R. Hatzenbeler, and J. M. Kampa. 2014. Distribution and relative abundance of the gilt darter *Percina evides* in Wisconsin. Wisconsin Department of Natural Resources Research Report Number 194.
- Jones, M. L., and G. J. A. Hansen. 2014. Making adaptive management work: lessons from the past and opportunities for the future. Taylor, W.W., Leonard, N., and A. Lynch, eds. Future of Fisheries: Perspectives for the Next Generation of Professionals. American Fisheries Society, Bethesda MD. To be published December 2014.
- Kampa, J., G. Hatzenbeler, and M. J. Jennings. Accepted. Status and management of lake sturgeon in the upper St. Croix River and Namekagon river, Wisconsin, USA. Proceedings of the Seventh International Symposium on Sturgeon.
- Kimirei, I. A., I. Nagelkerken, A. L. Rypel, N. Sooter, E. T. Gonzalez, and Y. D. Mgaya. Submitted. Demography of fish populations reveals complexities in appraising juvenile habitat values. Marine Ecology Progress Series 502: Final Revisions.
- Knight, S., J. Hauxwell and E. Haber. 2014. Distribution and abundance of aquatic plants – human impacts. The Elsevier Reference Module in Earth Systems and Environmental Sciences. ISBN: 978-0-12-409548-9.
- Kornis, M., B. Weidel, S. Powers, T. Cline, M. Diebel, J. Fox, and J. Kitchell. In review. Partial biotic homogenization following removal of an impassable barrier separating two disparate stream fish communities. Aquatic Sciences.
- LaLiberte, G. D. and E. Haber. 2014. Literature review on the effects of ultrasonic waves on cyanobacteria and other aquatic organisms. Research Report 195. Wisconsin Department of Natural Resources PUB-SS-595 2014.
- Leavengood, J., D. J. Soucek, G. G. Sass, A. Dickinson, and J. M. Epifanio. 2014. Elements of concern in filets of bighead and silver carp from the Illinois River, Illinois. Chemosphere 104: 63-68. DOI:10.1016/j.chemosphere.2013.10.058.

Research Publications

- Liss, S. A., G. G. Sass, and C. D. Suski. 2014. Influence of local-scale abiotic and biotic factors on stress and nutrition in invasive silver carp. *Hydrobiologia*. DOI:10.1007/s10750-014-1880-y.
- Lyons, J. 2014. Shovelnose sturgeon, *Scaphirhynchus platyrhynchus*. Online account in: Lyons, J., editor. 2014. Fishes of Wisconsin E Book. Wisconsin Department of Natural Resources, Madison, and U. S. Geological Survey, Middleton, WI, <http://www.fow-ebook.us>
- Lyons, J. 2014. Fishes of Wisconsin E-Book [Summary of all available information on the biology of Wisconsin fishes]. http://infotrek.er.usgs.gov/wdnr_fishes/index.jsp
- Lyons, J., and K. Schoephoester. 2014. FishMapper. USGS Great Lakes GAP and WDNR Fish Mapping Application [Interactive tool for precisely mapping the distribution of all fish species within Wisconsin]. <http://infotrek.er.usgs.gov/fishmap>
- Lyons, J., P. Hanson, E. White., J. F. Kitchell, P. Moy. 2014. Wiscfish. The site for identifying fishes of Wisconsin [Detailed photo-based identification system for all fish species potentially occurring in Wisconsin]. <http://wiscfish.org/> or <http://www.seagrant.wisc.edu/home/Default.aspx?tabid=604>
- McDonald, C. P., N. R. Lottig, J. L. Stoddard, A. T. Herlihy, S. Lehmann, S. G. Paulsen, D. V. Peck, A. I. Pollard, R. J. Stevenson. 2014. Comment on Bachmann et al. (2013): A nonrepresentative sample cannot describe the extent of cultural eutrophication of natural lakes in the United States. *Limnology and Oceanography*, in press.
- McDonald, C., B. Baker-Muhich, T. Fitz, P. Garrison, J. Petchenik, P. Rasmussen, R. Thiboldeaux, W. Walker, and C. Watras. 2014. Taconite iron mining in Wisconsin: a review. 4 March 2014. Internal report to DNR Mining Team.
- McIntyre, P. B., C. Reidy Liermann, E. Childress, E. J. Hamann, J. Hogan, S. R. Januchowski-Hartley, A. A. Koning, T. M. Neeson, D. L. Oele, and B. M. Pracheil. In review. Conservation of migratory fishes in freshwater ecosystems. In Closs G, Krkosek M, & Olden JD: Conservation of Freshwater Fishes.
- Miller, M., K. Songer, R. Dolen, and J. Lyons. 2014. Fishes. In Press in M. A. Miller, K. Songer, and R. Dolan, editors. Field guide to Wisconsin streams. University of Wisconsin Press, Madison.
- Mitro, M. G., M. P. Engel, R. S. Stewart, and J. B. Petchenik. In review. Public meeting and online survey on Wisconsin's inland trout program. DNR publication series.
- Mitro, M. G., S. Marcquenski, K. Soltau, and P. Kanehl. 2014. In press. Gill lice as a proximate cause of Brook Trout loss under changing climatic conditions. *Proceedings of Wild Trout XI*. Bozeman, Montana.
- Mouw, C., S. Greb, D. Aurin, P. DiGiacomo, Z. Lee, M. Twardowski, C. Binding, C. Hu, R. Ma, T. Moore and W. Moses. 2014 (accepted). Color Remote Sensing Color of Coastal and Inland Water: Challenges and Recommendations for the Future.
- Myers, R. A., M. W. Smith, J. M. Hoenig, N. Kmiecik, M. Luehring, M. T. Drake, P. J. Schmalz, and G. G. Sass. 2014. Determining size- and sex-specific capture and harvest selectivity for walleyes from tagging studies. *Transactions of the American Fisheries Society* 143:438-450. DOI:10.1080/00028487.2013.862177.
- Nault, M. E., M. D. Netherland, A. Mikulyuk, J. G. Skogerboe, T. Asplund, J. Hauxwell, P. Toshner. 2014. Efficacy, selectivity, and herbicide concentrations following a whole-lake 2,4-D application targeting Eurasian Watermilfoil in two adjacent northern Wisconsin lakes. *Lake and Reservoir Management* 30: 1-10.
- Nault, M. In press. Governor's Council on Invasive Species and Wisconsin DNR - technical reviews of 42 potentially invasive aquatic plants and algae in Wisconsin. Wisconsin Department of Natural Resources Bureau of Science Services, Madison, Wisconsin, USA.

Research Publications

- Oele, D. L., D. J. Hogan, and P. B. McIntyre. In review. Tracking migrations of northern pike in Great Lakes tributaries: if we restore breeding habitat, will they come? *Canadian Journal of Fisheries and Aquatic Sciences*.
- Parks, T. P., M. C. Quist, and C. L. Pierce. In review. Anthropogenic disturbance and environmental associations with fish assemblage structure in two nonwadeable rivers in Iowa. *River Research and Applications*.
- Parks, T. P., M. C. Quist, and C. L. Pierce. 2014. Historical changes in fish assemblage structure in Midwestern nonwadeable rivers. *American Midland Naturalist* 171: 27-53.
- Piette, R. 2014. Project update report: Distribution of *Epioblasma triquetra* (Snuffbox) in the Wolf River System. WI. 2013 Summary Report.
- Piette, R. 2014. Study: Effects of flow regulation and restriction of passage due to hydroelectric project operation on the structure of fish and invertebrate communities in Wisconsin's large river systems. WDNR FINAL REPORT. Phase II: Menominee River Fish and Habitat Conditions Post Flow Regulation Changes.
- Pracheil, B. M., J. D. Hogan, J. Lyons, and P. B. McIntyre. 2014 (in press). Using hard-part microchemistry for conservation and management of North American freshwater fishes. *Fisheries* 39.
- Read, J. R., L. A. Winslow, G. J. A. Hansen, J. Van Den Hoek, P. Hanson, L. Bruce, C. Markfort. In review. Simulating 2,400 lakes to understand individual and regional responses to climate. *Global Change Biology*.
- Rypel, A. L. 2014. The coldwater connection: Bergmann's rule in North American freshwater fishes. *The American Naturalist* 183: 147-156.
- Rypel, A. L. 2014. Do invasive freshwater fish species grow better when they're invasive? *Oikos*. Published online. DOI: 10.1111/j.1600-0706.2013.00530.x
- Sass, G. G. and M. S. Allen. 2014. *Foundations of fisheries science*. American Fisheries Society Press, Bethesda, Maryland.
- Sass, G. G. and M. S. Allen. 2014. Q&A: Book editors Greg G. Sass and Michael S. Allen – *Foundations of Fisheries Science*. *Fisheries* 39(7): 316-317.
- Sass, G. G., C. Hinz, A. C. Erickson, N. N. Michaels, M. A. McClelland, and J. M. Epifanio. Provisionally accepted. Invasive Asian carp (*Hypophthalmichthys* spp.) effects on zooplankton communities in the Illinois River (Illinois, USA). *Journal of Great Lakes Research*.
- Stackpoole, S. M., D. Butman, D. Clow, C. McDonald, E. Stets, R. Striegl. 2014. Carbon sequestration, transport, and emission from inland aquatic ecosystems in the Eastern United States. in Zhang Z., and B.C. Reed, eds. *Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Eastern United States*. USGS Professional Paper, in press.
- Stewart, J. M., J. Bruce, A. Covert, D. Infante, D. Krueger, J. Lyons, J. McKenna, M. Slattery, L. Wang, K. Wehrly, D. Wieferich, S. Westenbroek. 2014. FishVis. Predicted effects of climate change on stream fishes in the Great Lakes Region [Interactive tool for users to map and summarize predicted changes in stream fish distribution in response to climate change over the next 50-100 years]. <http://wim.usgs.gov/FishVisMapper/FishVis.html>
- Stewart, J. S., S. M. Westenbroek, M. G. Mitro, J. D. Lyons, L. Kammel, and C. A. Buchwald. 2014. In press. A model for evaluating stream temperature response to climate change in Wisconsin. USGS Research Report Series.
- Wagner, K. I., C. Schreck, J. Hauxwell, A. Mikulyuk, M. Wilkinson, S. Van Egeren, and D. L. Oele. January 2014. Reducing invasive organisms in trade in Great Lakes watersheds. Draft Final Report to Environmental Protection Agency for Great Lakes Restoration Initiative Project.

Research Publications

- Watras, C. J., K. A. Morrison, J. T. Crawford, C. P. McDonald, S. K. Oliver, and P. C. Hanson. In review. Diel CDOM fluorescence cycles in dystrophic Wisconsin seepage lakes: implications for DOM turnover. *Limnology and Oceanography*.
- Watras, C. J., K. M. Morrison, J. Mather, P. Milewski and P. C. Hanson. 2014. Correcting CDOM fluorescence for temperature effects under field conditions in freshwaters. *Limnology and Oceanography Methods* 12: 23-24.
- Watras, C. J., M. Morrow, K. Morrison, S. Scannell, S. Yazicioglu, J. S. Read, Y-H Hu, P. C. Hanson and T. Kratz. 2014. Evaluation of wireless sensor networks (WSNs) for remote wetland monitoring: design and initial results. *Environmental Monitoring and Assessment* 186: 919-934.
- Watras, C. J., J. S. Read, K. D. Holman, Z. Liu, Y-Y. Song, A. J. Watras, S. Morgan and E. H. Stanley. 2014. Decadal oscillation of lakes and aquifers in the upper Great Lakes region of North America: hydroclimatic implications. *Geophysical Research Letters* 41(2): 456-462.
- Zhu, F., A. L. Rypel, B. R. Murphy, Z. Li, T. Zhang et al. 2014. Rapid life-history diversification of an introduced fish species across a localized thermal gradient. *PLoS ONE* 9(2): e88033. doi:10.1371/journal.pone.0088033

2013

- Barton, M. E., A. Mikulyuk, M. Nault, K. Wagner, J. Hauxwell, S. van Egeren, T. Asplund, J. Skogerboe, S. Jones, J. Leverance and S. Graham. 2013. Early season 2,4-D herbicide and deep harvesting treatment effects on Eurasian watermilfoil (*Myriophyllum spicatum*) and native macrophytes in Turville Bay, Lake Monona, Dane County, Wisconsin. Final Report. Wisconsin Department of Natural Resources Bureau of Science Services, PUB-SS-1120 2013.
- Bartrons, M., M. Papes, M. W. Diebel, C. Gratton, and M. J. Vander Zanden. 2013. Regional-level inputs of emergent aquatic insects from water to land. *Ecosystems* 16: 1353–1363.
- Carpenter, S. and D. Lathrop. 2013. Phosphorus loading, transport and concentrations in a lake chain: a probabilistic model to compare management options. *Aquatic Sciences*. DOI 10.1007/s00027-013-0324-5.
- Cross, B. K., M. A. Bozek, and M. G. Mitro. 2013. Influences of riparian vegetation on trout stream temperatures in central Wisconsin. *North American Journal of Fisheries Management* 33: 682-692.
- Diebel, M. 2013. Priorities for barrier removal to improve access to northern pike spawning habitat in Green Bay tributaries. Project report to The Nature Conservancy.
- Garrison, P. 2013. Paleocological study of Waushara County lakes. Wisconsin Department of Natural Resources. PUB-SS-1125 2013.
- Garrison, P. 2013. Paleocological Study of Marathon County Lakes. Wisconsin Department of Natural Resources. PUB-SS-1126 2013.
- Garrison, P. J. 2013. Eagle Lake zooplankton report for 2012. 8 pp.
- Garrison, P. J. 2013. Results of sediment core taken from Big Doctor Lake, Burnett County, Wisconsin. 5 pp.
- Garrison, P. J. 2013. Results of sediment core taken from Sand Lake, Barron County, Wisconsin. 5 pp.
- Garrison, P. J. 2013. Results of sediment cores taken from Amnicon and Dowling lakes, Douglas County, Wisconsin. 5 pp.
- Hansen, G. J. A., M. J. Vander Zanden, M. J. Blum, M. K. Clayton, E. K. Hain, J. Hauxwell, M. Izzo, M. S. Kornis, P. B. McIntyre, A. Mikulyuk, E. Nilsson, J. D. Olden, M. Papes, S. Sharma. 2013. Commonly

Research Publications

rare and rarely common: comparing population abundance of invasive and native aquatic species. PLOS ONE 8(10): e77415. doi:10.1371/journal.pone.0077415.

- Hansen, G. J. A., A. R. Ives, M. J. Vander Zanden, and S. R. Carpenter. 2013. Are rapid transitions between invasive and native species caused by alternative stable states, and does it matter? Ecology 94(10): 2207–2219.
- Hansen, G. J. A., C. L. Hein, B. M. Roth, M. J. Vander Zanden, J. W. Gaeta, A. W. Latzka, S. R. Carpenter. 2013. Food web consequences of long-term invasive crayfish control. Canadian Journal of Fisheries and Aquatic Sciences. 70: 1109-1122, <http://dx.doi.org/10.1139/cjfas-2012-0460>
- Hauxwell, J., M. Wilkinson, K. Wagner, S. Van Egeren and A. Mikulyuk. July 2013. Progress report: US Environmental Protection Agency-Great Lakes Restoration Initiative Projects. Project title: reducing live organisms in trade in Great Lakes watersheds. Reporting period covered: 1/1/2013 - 6/30/2013.
- Hauxwell, J., M. Wilkinson, K. Wagner, S. Van Egeren and A. Mikulyuk. January 2013. Progress report: US Environmental Protection Agency-Great Lakes Restoration Initiative Projects. Project title: reducing live organisms in trade in Great Lakes watersheds. Reporting period covered: 7/1/2012 – 12/31/2012.
- Hoffman, A. R., D. E. Armstrong, and R. C. Lathrop. 2013. Influence of phosphorus scavenging by iron in contrasting dimictic lakes. The Canadian Journal of Fisheries and Aquatic Sciences 70(7): 941-952.
- Januchowski-Hartley, S., P. McIntyre, M. Diebel, P. Doran, D. Infante, C. Joseph, and J. D. Allan. 2013. Restoring aquatic ecosystem connectivity requires expanding barrier inventories. Frontiers in Ecology and the Environment 11: 211–217.
- Jennings, M. 2013. Longear sunfish, *Lepomis megalotis*. Online account in: Lyons, J., editor. 2013. Fishes of Wisconsin E Book. Wisconsin Department of Natural Resources, Madison, and U. S. Geological Survey, Middleton, WI, <http://www.fow-ebook.us>
- Kanehl, P., and B. Weigel. 2013. Evaluation of the Wisconsin priority watershed program for improving stream habitat and fish communities. Sport Fish Restoration Funds Final Report. 113 pp.
- Kenow, K., T. Fox, P. Garrison, and M. Meyer. 2013. Historic distribution of common loons in Wisconsin in relation to changes in lake characteristics and surrounding land use. The Passenger Pigeon 75(4): 375-389.
- Kimirei, I., I. Nagelkerken, M. Trommelen, P. Blankers, N. van Hoytema, D. Hoeijmakers, C. Huijbers, Y. Mgaya, and A. L. Rypel. 2013. What drives ontogenetic niche shifts of fishes in coral reef ecosystems? *Ecosystems* 16: 783-796.
- LaLiberte, G. D. 2013. Blue-green algae: how to protect yourself & your pets. Rock River Reflections: Rock River Coalition Newsletter Summer 2013.
- Lamer, J. T., G. G. Sass, J. Q. Boone, Z. H. Arbieva, S. J. Green, and J. M. Epifanio. 2013. Restriction site-associated DNA sequencing generates high quality single nucleotide polymorphisms for assessing hybridization between bighead and silver carp in the United States and China. Molecular Ecology Resources DOI: 10.1111/1755-0998.12152.
- Lathrop, R. C. and S. R. Carpenter. 2013. Water quality implications from three decades of phosphorus loads and trophic dynamics in the Yahara chain of lakes. Inland Waters (2013) 4: 1-14. DOI: 10.5268/IW-4.1.680.
- Lathrop, R. C., D. S. Liebl, and K. Welke. 2013. Carp removal to increase water clarity in shallow eutrophic Lake Wingra. LakeLine 33(3): 23-30.
- Lathrop, R. C., J. R. Reimer, K. K. Sorsa, G. M. Steinhorst, and C.H. Wu. 2013. Madison's lake beaches results of a three-year pilot study. LakeLine 33(3): 31-38.

Research Publications

- Leavengood, J., D. Soucek, A. Dickinson, G. G. Sass, and J. Epifanio. 2013. Spatial and interspecific patterns in persistent contaminant loads in bighead and silver carp from the Illinois River. *Ecotoxicology* 22(7): 1174-1182. DOI 10.1007/s10646-013-1105-6.
- Lee, Z., N. Pahlevan, Y.H. Ahn, S. Greb, and D. O'Donnell. 2013. Robust approach to directly measuring water-leaving radiance in the field. *Applied Optics* 52(8):1693-1701. doi: 10.1364/AO.52.001693
- Liss, S. A., G.G. Sass, and C. D. Suski. 2013. Spatial and temporal influences on the physiological condition of invasive silver carp. *Conservation Physiology* 1: doi:10.1093/conphys/cot017.
- Lyons, J. 2013. A photo-based system for identifying Wisconsin (USA) fishes. Pages 81-82 in J. Fischer, editor. Fish identification tools for biodiversity and fisheries assessment: review and guidance for decision-makers. FAO Fisheries and Aquaculture Technical Paper No. 585. Food and Agriculture Administration of the United Nations, Rome, Italy. 107 pp.
- Lyons, J. 2013. Blue sucker, *Cycoreptus elongatus*. Online account in: Lyons, J., editor. 2013. Fishes of Wisconsin E Book. Wisconsin Department of Natural Resources, Madison, and U. S. Geological Survey, Middleton, WI, <http://www.fow-ebook.us>
- Lyons, J. 2013. Silver chub, *Macrhybopsis storerianus*. Online account in: Lyons, J., editor. 2013. Fishes of Wisconsin E Book. Wisconsin Department of Natural Resources, Madison, and U. S. Geological Survey, Middleton, WI, <http://www.fow-ebook.us>
- Lyons, J., editor. 2013. Fishes of Wisconsin E Book. Wisconsin Department of Natural Resources, Madison, and U. S. Geological Survey, Middleton, WI, <http://www.fow-ebook.us>
- McClelland, M. A., K. S. Irons, G. G. Sass, T. M. O'Hara, and T. R. Cook. 2013. A comparison of two electrofishing programmes used to monitor fish on the Illinois River, Illinois, USA. *River Research and Applications* 29: 125-133. DOI:10.1002/rra.1590
- McDonald, C., E. G. Stets, R. G. Striegl, D. Butman. 2013. Inorganic carbon loading as a primary driver of dissolved carbon dioxide concentrations in the lake sand reservoirs of the contiguous United States. *Global Biogeochemical Cycles* 27(2).
- Menuz, D. R., A. S. Ruesch, and M. W. Diebel. 2013. 1:24K Hydrography Attribution Metadata. ftp://dnrftp01.wi.gov/geodata/hydro_va_24k/WDNR_Hydro_VA_metadata/hydro_va_documentation.pdf
- Meyer, M. M., J. F. Walker, K. P. Kenow, P. S. Rasmussen, P. J. Garrison, P. C. Hanson, R. J. Hunt. 2013. Potential effects of climate change on inland glacial lakes and implications for lake dependent biota in Wisconsin. *Focus on Energy*.
- Mitro, M. 2013. Report on Ash Creek brook trout survival, abundance, and recruitment as part of the DNR wild trout stocking program.
- O'Donnell, D., S. W. Effler, M. Perkins, C. Strait, Z. Lee, S. Greb. 2013. Resolution of optical gradients and pursuit of optical closure for Green Bay. *Lake Michigan Journal of Great Lakes Research* 39(1): 161-172.
- Oele, D. L. and P. B. McIntyre. 2013. Green Bay pike project report for the Lower Green Bay - Fox River area of concern integrated stream & wetland restoration. Environmental Protection Agency and The Nature Conservancy Report. Great Lakes Restoration Initiative Funding, EPA-R5- GL20101
- Oele, D. L. and P. B. McIntyre. 2013. White sucker isotope and tumor analysis report for the Milwaukee and Kewaunee Rivers. Environmental Protection Agency, Great Lakes Restoration Initiative Grant #: 00E00876-sub4 and 00E00712-1

Research Publications

- O'Hanley, J., J. Wright, M. Diebel, M. Fedora, and C. Soucy. 2013. Restoring stream habitat connectivity: A proposed method for prioritizing the removal of resident fish passage barriers. *Journal of Environmental Management* 125:19-27.
- Perera, H. A. C. C., B. R. Murphy, Z. Li, A. L. Rypel, T. Zhang, Y. Xia, and J. Liu. 2013. Population characteristics of yellow catfish (*Peltobagrus fluvidraco*) along the longitudinal profile of Three Gorges Reservoir, China. *Journal of Applied Ichthyology* 29: 1061-1066.
- Pracheil, B. M., P. B. McIntyre, and J. Lyons. 2013. Enhancing conservation of large-river biodiversity by accounting for tributaries. *Frontiers in Ecology and the Environment* 11: 124-128. (<http://dx.doi.10.1890/12179>).
- Raymond, P. A., J. Hartmann, R. Lauerwald, S. Sobek, C. McDonald, M. Hoover, D. Butman, R. Striegl, E. Mayorga, C. Humborg, P. Kortelainen, H. Durr, M. Meybeck, P. Ciais, and P. Guth. 2013. Global carbon dioxide emissions from inland waters. *Nature* 503: 355-359.
- Richard, J. C. and A. L. Rypel. 2013. Water body type influences climate–growth relationships of freshwater drum. *Transactions of the American Fisheries Society* 142: 1308-1320.
- Ruesch, A. S., D. R. Menuz, and M. W. Diebel. 2013. 1:24K Hydrography creation toolset. ArcGIS Toolbox.
- Rypel, A. L. 2013. Book review: Fisheries Techniques 3rd Edition. *Transactions of the American Fisheries Society*, 142: 1153.
- Schramm, H. L. and A. L. Rypel. 2013. Catfish growth factors. In-Fisherman 2013 Guide Catfish Insider issue.
- Stackpoole, S. M., D. Butman, D.W. Clow, C. P. McDonald, E. G. Stets, R. G. Striegl. 2013. Baseline carbon sequestration, transport, and emissions from inland aquatic ecosystems in the Western United States. in Zhang Z., and B.C. Reed, eds. Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of the Western United States. U.S. Geological Survey Professional Paper 1797: 125-142.
- Tsehaye, I., M. Catalano, D. Glover, G. G. Sass, and B. M. Roth. 2013. Prospects for fishery-induced collapse of invasive Asian carp in the Illinois River. *Fisheries* 38(10): 445-454. (Top three most popular articles published in *Fisheries* in 2013).
- Wang, L., T. Brenden, J. Lyons, and D. Infante. 2013. Predictability of in-stream physical habitat for Wisconsin and northern Michigan wadeable streams using GIS-derived landscape data. *Riparian Ecology and Conservation* 2013: 11-24. Doi: 10.2478/remc-2013-0003.
- Wu, C., R. Lathrop and K. Welke. April 2013. Sediment and carp dynamics in Lake Mendota's Yahara River estuary. Final project report for DNR Lake Planning Grant to Dane County with subcontract to UW–Madison.

2012

- Bugbee, G., M. Barton, J. Gibbons. 2012. Connecticut's aquatic and wetland invasive plant identification guide. 2nd Edition. The Connecticut Agricultural Experiment Station. 42 pp. Bulletin No. 1035.
- Garrison, P.J and G. LaLiberte. 2012. Evaluation of the Bad River Wetlands—2011. Wisconsin Department of Natural Resources. PUB SS-1096 2012. 15 pp.
- Garrison, P.J. 2012. Report on St. Louis AOC water quality sampling, 2011. 4 pp.
- Garrison, P.J. 2012. Results of sediment core taken from Black Oak Lake, Vilas County, Wisconsin. 8 pp.

Research Publications

- Garrison, P.J. 2012. Results of sediment core taken from Cedar Lake, Manitowoc County, Wisconsin. 6 pp.
- Garrison, P.J. 2012. Results of sediment cores taken from Amnicon and Dowling Lakes, Douglas County, Wisconsin. 13 pp.
- Garrison, P.J. 2012. Results of sediment cores taken from Big and Little Arbor Vitae Lakes, Vilas County, Wisconsin. 8 pp.
- Garrison, P.J., C. Carlson, R. Bednarz, and S. Heiskary. 2012. NLA results for the Upper Midwest Area. LakeLine. pp. 32-36.
- Garrison, P., K. Kenow, G. LaLiberte, J. Lyons and M. Meyer contributed to the following publication: Markham, L., and R. Dudzik. 2012. Impervious surfaces: how they impact fish, wildlife and waterfront property values. University of Wisconsin Extension Publication GWQ-061 I-10-2012 and Wisconsin Department of Natural Resources WT-190 2012.
- Hauxwell, J., M. Wilkinson, K. Wagner, S. Van Egeren and A. Mikulyuk. July 2012. Progress report: US Environmental Protection Agency-Great Lakes Restoration Initiative Projects. Project title: reducing live organisms in trade in Great Lakes watersheds. Reporting period covered: 1/1/2012 - 6/30/2012.
- Hauxwell, J., M. Balfour (eds). 2012. WDNR fisheries and aquatic sciences research program 2009-2010 biennial report. 165 pp. DNR internal publication.
- LaLiberte, G. D. 2012. Algal blooms in Wisconsin: the challenges of phosphorus reduction, invasive species, and climate change. Wisconsin People & Ideas Summer 2012. Pp. 18-23.
- Lyons, J. 2012. Development and validation of two fish-based indices of biotic integrity for assessing perennial coolwater streams in Wisconsin, USA. Ecological Indicators 23: 402-412.
- McClelland, M. A. and G. G. Sass. 2012. Assessing fish collections from random and fixed site sampling methods on the Illinois River. Journal of Freshwater Ecology 27: 325-333. DOI:10.1080/02705060.2012.658213.
- McClelland, M. A., G. G. Sass, T. R. Cook, K. S. Irons, N. N. Michaels, T. M. O'Hara, and C. S. Smith. 2012. The long-term Illinois fish population monitoring program. Fisheries 37(8): 340-350.
- Mitro, M. G. 2012. Statistical methods for determining significant change. Chapter 5 in C. Jones, Editor. Fishers and Farmers Monitoring Protocol. Fishers and Farmers Fish Habitat Partnership for the Upper Mississippi River Basin.
- Mouw, C. and S. Greb. 2012. AGU-EOS Fall 2012 Newsletter, Workshop for remote sensing of coastal and inland waters, 20-22 June 2012 Summary.
- Nault, M., A. Mikulyuk, J. Hauxwell, J. Skogerboe, T. Asplund, M. Barton, K. Wagner, T. Hoyman, and E. Heath. 2012. Herbicide treatments in Wisconsin lakes: building a framework for scientific evaluation of large-scale herbicide treatments in Wisconsin lakes. NALMS LakeLine 32:21-26.
- Roth, B. M., N. E. Mandrak, J. Peters, T. R. Hrabik, and G. G. Sass. 2012. Fishes and decapod crustaceans of the Great Lakes basin. In: Great Lakes Policy and Management, 2nd Edition. W.W. Taylor and A. Lynch (eds). Michigan State University Press, East Lansing, Michigan.
- Ruebush, B. C., G. G. Sass, J. H. Chick, and J. D. Stafford. 2012. In situ tests of sound-bubble-strobe light barrier technologies to prevent range expansions of Asian carp. Aquatic Invasions 7: 37-48. DOI:10.3391/ai.2012.7.01
- Sass, G. G., S. R. Carpenter, J. E. Gaeta, J. F. Kitchell, and T. D. Ahrenstorff. 2012. Whole-lake addition of coarse woody habitat: response of fish populations. Aquatic Sciences-Research Across Boundaries 74: 255-266. DOI:10.1007/s00027-011-0219-2.

Research Publications

Striegl, R. G., M. M. Dornblaser, C. P. McDonald, J. R. Rover, E. G. Stets. 2012. Carbon dioxide emissions from the Yukon River system. *Global Biogeochemical Cycles* 26(4).

Wagner, K. and A. Mikulyuk. 2012. Rapid macrophyte habitat assessment methodology. Miscellaneous Publication PUB-SS-1118 2012. Bureau of Science Services, Wisconsin Department of Natural Resources, Madison, WI.

Watras, C. J. 2012. Impacts of climate change on fluxes of carbon and water in northern Wisconsin lakes and wetlands. Final Project Report to Wisconsin Focus on Energy, EERD Project Code 3104-01-09.

Research Presentations

Research Presentations

In addition to publishing research results, the professionals employed by the Fisheries and Aquatic Sciences Research Section routinely present the results of their work in the form of presentations. Presentations range from hour-long academic seminars to short scientific talks and are given to a variety of audiences. There were 333 staff presentations given from July 2012 – June 2014 and are listed below.

2014

- Barton, M., M. Nault, A. Mikulyuk, K. Wagner, and J. Hauxwell. (25 April 2014). Early season 2,4-D herbicide and harvesting treatment effects on Eurasian watermilfoil in Turville Bay Lake Monona, Dane County. Poster Presentation. 2014 Wisconsin Lakes Convention, Steven's Point, WI.
- Barton, M. A. Mikulyuk, M. Nault, K. Wagner, J. Hauxwell, S. van Egeren, T. Asplund, J. Skogeboe, S. Jones, J. Leverance, S. Graham. (January 9, 2014). Early season 2,4-D herbicide and deep harvesting treatment effects on Eurasian watermilfoil (*Myriophyllum spicatum*) and native macrophytes in Turville Bay, Lake Monona, Dane County, Wisconsin. Dane County Lakes and Watershed Commission Meeting, Madison WI.
- Butitta, V., A. L. Rypel, and E. Stanley. (May 2014). Linking freshwater mussel growth to environmental drivers. Joint Aquatic Sciences Meeting, Portland, OR.
- Cochran, P. A., and J. Lyons. (17-21 August 2014). The silver lamprey and the paddlefish. Annual Meeting of the American Fisheries Society, Quebec City, Canada.
- Cunningham, P., M. Diebel, J. Griffin, J. Lyons, M. Mitro, and J. Pohlman. (4-5 February 2014). Adaptation strategies for brook trout management in the face of climate change. Annual Driftless Area Symposium, LaCrosse, Wisconsin.
- Chandler, H. C., A. L. Rypel, C. A. Haas, and T. A. Gorman. (May 2014). Modeling hydroperiod of ephemeral wetlands in pine flatwoods: potential impacts of climate change on *Ambystoma bishop* reproduction. Joint Aquatic Sciences Meeting. Portland, OR.
- Diebel, M., A. Ruesch, D. Menuz. (15 April 2014). Ecological limits of hydrologic alteration in Dane County streams. Dane County Land Conservation Department, Madison, WI.
- Diebel, M., T. Paoli, P. McIntyre, D. Oele, E. Childress, J. Maxted, A. Somor, A. Shaw, and N. Van Helden. (1 April 2014). Prioritizing barrier removal for northern pike spawning migration in Green Bay tributaries. Road/Stream Crossings – Inventory, Assessment, Design and Construction Workshop, Green Bay, WI.
- Diebel, M., M. Fedora. (1 April 2014). Fish passage barrier inventory, assessment and prioritization. Road/Stream Crossings – Inventory, Assessment, Design and Construction Workshop. Green Bay, WI.
- Diebel, M. and C. Hardin. (1 April 2014). How streams work. Road/Stream Crossings – Inventory, Assessment, Design and Construction Workshop, Green Bay, WI.
- Diebel, M. (28 March 2014). Nitrogen in Wisconsin streams. UW College of Agricultural and Life Sciences Nitrogen Science Symposium, Madison, WI.
- Diebel, M. (19 March 2014). Fisheries research overview. 2014 Orientation for new Fisheries Staff Meeting, Madison, WI.

Research Presentations

- Diebel, M., A. Ruesch, D. Menuz. (13 March 2014). Ecological limits of hydrologic alteration in Dane County streams. Capital Area Regional Planning Commission, Madison, WI.
- Diebel, M., A. Ruesch, D. Menuz, J. Stewart, and S. Westenbroek. (11 March 2014). Predicting effects of stream flow reductions on fish to support groundwater use permitting decisions. Water Resources Statewide Meeting, Treehaven, WI.
- Diebel, M. (14 February 2014). Approaches for balancing fish passage with invasive species management. Science Services Open House, Madison, WI.
- Diebel, M., A. Ruesch, D. Menuz, J. Stewart, and S. Westenbroek. (14 February 2014). Effects of flow alteration on stream fish: implications for groundwater use. Science Services Open House, Madison, WI.
- Diebel, M., A. Ruesch, D. Menuz, J. Stewart, and S. Westenbroek. (12 February 2014). Ecological limits of hydrologic alteration in Wisconsin streams. The Center for Limnology Seminar Series, Madison, WI.
- Diebel, M. (3-5 February 2014). Biological effects of nitrogen in Wisconsin streams. Environmental Protection Agency Nutrient Criteria meeting, Chicago, IL.
- Diebel, M., A. Ruesch, D. Menuz, J. Stewart, and S. Westenbroek. (21-22 January 2014). Groundwater withdrawals: modeling fisheries responses. 2014 WDNR Fisheries Biologist and Supervisors Meeting, Wausau, WI.
- Engel, M. P., M. G. Mitro, T. A. Motl, J. B. Petchenik, D. A. Seibel, and R. S. Stewart. (13 March 2014). Ask the experts, WDNR live online chat on trout regulation review, trout angler survey, spring advisory questions, Madison, Wisconsin.
- Engel, M. P., J. D. Griffin, M. G. Mitro, G. J. Van Dyck, and J. G. Weeks. (18 February 2014). Ask the experts. WDNR live online chat about Wisconsin's early trout season, Madison, Wisconsin.
- Frater, P., M. Nault, M. Barton, A. Mikulyuk, K. Wagner, and J. Hauxwell. (25 April 2014). Long-term trends in statewide Eurasian watermilfoil populations. Poster Presentation. 2014 Wisconsin Lakes Convention, Steven's Point, WI.
- Garrison, P., S. Greb, and G. LaLiberte. (10 June 2014). Wisconsin DNR Monitoring of the Western Coast of Lake Michigan: Water Chemistry and *Cladophora* Growth. Great Lakes Webinar, U.S. Environmental Protection Agency Region 5.
- Garrison, P. and C. Carlson. (30 April 2014). Comparison of Wisconsin's results from National Lake Assessments in 2007 and 2012. Presentation given at 9th National Monitoring Conference, Cincinnati, OH.
- Garrison, P. (26 April 2014). Lake ecology with Paul. Wisconsin Lakes Convention, Stevens Point, WI.
- Garrison, P. (11 March 2014). Limnology and water chemistry. Water Resources Statewide Meeting, Treehaven, WI.
- Garrison, P. (14 February 2014). Long-term phosphorus trends. Science Services Open House, Madison, WI.
- Garrison, P. (4 February 2014). Paleolimnological study of Geneva Lake. Graduate Class of George Williams College Science Open House, Williams Bay, WI.
- Greb, S. (24 April 2014). Water quality of Lake Nicaragua. Wisconsin Lakes Partnership Conference. Stevens Point, WI
- Greb, S. (3 April 2014). Remote sensing of water quality in Wisconsin. Global Lakes Sentinel Services Project meeting U. of Tartu, Estonia.

Research Presentations

- Gyawali, R. and S. Greb. (14 March 2014). Seasonal streamflow changes in Wisconsin watersheds. American Water Resources Association, Wisconsin Section. Wisconsin Dells, WI.
- Greb, S. (12 March 2014). Great Lakes Remote Sensing Workshop, Cleveland, Ohio.
- Greb, S., R. Gyawali, C. Noll, R. OConnor. (4 March 2014). Wisconsin River Island project update, Milwaukee, WI.
- Greb, S. (14 February 2014). Use of remote sensing in water quality monitoring. Science Services Open House, Madison, WI.
- Greb, S. (14 January 2014). Remote sensing in inland waters. GloboLakes Conference, Stirling, Scotland.
- Gyawali, R. and S. R. Greb. (13-14 March 2014). Seasonal streamflow changes in Wisconsin watersheds. AWRA Wisconsin Section, Wisconsin Dells, WI.
- Gyawali, R. (4 March 2014). Application of regional regression model to evaluate changes in Wisconsin River Islands. North Eastern States Field Office, Bureau of Land Management (BLM), Milwaukee, WI.
- Hein, C., P. Garrison, and C. Carlson. (30 April 2014). Lakeshore habitat condition of Wisconsin lakes across gradients in land use and lake area: building on the National Lake Assessment. Presentation given at 9th National Monitoring Conference, Cincinnati, OH.
- Hansen, G. J. A., J. R. Read, L. A. Winslow. (25 April 2014). Predicting water temperature and its effects on sport fish in Wisconsin Lakes. 2014 Wisconsin Lakes Partnership Convention, Steven's Point, WI.
- Hansen, G. (19 March 2014). Describing, predicting, and managing for trends in Wisconsin's lake fish communities. 2014 Orientation for new Fisheries Staff Meeting, Madison, WI.
- Hansen, G. and J. Hennessy. (26 February 2014). Predicting walleye recruitment success. Wisconsin Chapter of the American Fisheries Society 2014 Annual Meeting, Green Bay, Wisconsin.
- Hansen, G. (14 February 2014). Trends and trajectories of Wisconsin's walleye: what does it mean for management? Science Services Open House, Madison, WI.
- Hansen, G. (13 February 2014). Simulating thermal and oxygen dynamics of Wisconsin's lakes: progress, future directions, applications. Science Services Fisheries and Aquatic Sciences Section meeting, Madison, WI.
- Hansen, G. (12 February 2014). Trends and trajectories of Wisconsin's walleye populations: research to inform management. Center for Limnology Seminar Series, Madison, WI.
- Hauxwell, J. (28 April 2014). Fisheries and aquatic sciences research updates and your future research needs. Wisconsin DNR Research Review Team. Science Operations Center, Madison, WI.
- Hauxwell, J. (19 March 2014). Welcome to Science Services and research section overview. Wisconsin DNR Fisheries Management Orientation Training for New Employees, Madison, WI.
- Hauxwell, J. (11 March 2014). Science Services updates and your future research needs. Wisconsin DNR Water Resources Statewide Meeting. UW-Steven's Point Treehaven. Tomahawk, WI.
- Kampa, J., T. Parks, N. Rosenberg, and P. Neubich. (25-27 February 2014). Implementation of an automated fish harvesting system at the Governor Thompson fish hatchery. Wisconsin Chapter of the American Fisheries Society 43rd Annual Meeting, Green Bay, WI. Poster Presentation.
- Kampa, J. (14 February 2014). Using angler-collected muskellunge data to guide management programs. Science Services Open House, Madison, WI.

Research Presentations

- Knight, S.E. (May 2014). Aquatic plant identification and ecology. EcoTrek (a day of ecological experiences for 7th graders from a local elementary school). Kemp Natural Resources Station, Woodruff, WI.
- Knight, S., T. Kratz and C. J. Watras. (24-26 April 2014). Back to the point of lake management. Keynote Plenary Session. 36th Annual Wisconsin Lakes Partnership Convention, Stevens Point, WI.
- Knight, S. E. and J. E. Havel. (April 2014). A multi-lake field experiment to test the efficacy of milfoil weevil for control of Eurasian water-milfoil (poster). WI Lakes Convention, Stevens Point, WI.
- Knight, S.E. (January through May 2014). Science on tap-Minocqua. Moderator. On-going monthly science presentations to the public.
- Kratz, T, J. Gaeta, G. Hansen, J. Walker and C. Watras. (24-26 April 2014). Climate change, water levels and the ecology of northern Wisconsin lakes. 36th Annual Wisconsin Lakes Partnership Convention, Stevens Point, WI.
- LaLiberte, G. (24-26 June 2014). Field identification of algae. Aquatic Plant Identification Workshops, Kemp Natural Resources Station, Woodruff, WI.
- LaLiberte, G. (14 February 2014). The Wisconsin harmful algal bloom surveillance program and other algal monitoring efforts in Wisconsin. Science Services Open House, Madison, WI.
- Lyons, J. 2014. Fish sampling and identification. Field demonstration at Training Session for New Fisheries Management Employees, Mukwonago, WI, June 25, 2014.
- Lyons, J., and J. M. Stewart. (9-11 June 2014). Conserving riverine lake sturgeon in Wisconsin under a warming climate: the importance of connectivity. Fourth Fish Passage Symposium, Madison, Wisconsin.
- Lyons, J. 2014. The walleye fishery of the Lower Wisconsin River: the challenges of understanding and managing an open and highly mobile population. Presentation to the Fitchburg Fisheries Team of the Wisconsin DNR, Fitchburg, WI, June 4, 2014.
- Lyons, J. (28-29 May 2014). Stream fish sampling and fish identification. Field Training Course for WDNR Water Quality Biologists, Dane County and Marathon County, WI.
- Lyons, J. 2014. The walleye fishery of the Lower Wisconsin River: the challenges of understanding and managing an open and highly mobile population. Presentation to the Fisheries Management Board of the Wisconsin DNR, Oshkosh, WI, May 22, 2014.
- Lyons, J. (24-26 April 2014). Effects of climate change on cisco, a keystone fish species in Wisconsin's deepest lakes. 36th Annual Wisconsin Lakes Convention, Stevens Point, Wisconsin.
- Lyons, J. (20 March 2014). Overview of invasive, threatened/endangered, and non-game fish research. Training session for new WDNR Fisheries employees. Madison, WI.
- Lyons, J. (19 March 2014). Presentation on invasive/rare/nongame fishes. 2014 Orientation for new Fisheries Staff Meeting, Madison, WI.
- Lyons, J. (11-13 March 2014). Everything you always wanted to know about fish bioassessment (but were afraid to ask), 2 hour training. Water Resources Statewide Meeting, Treehaven, WI.
- Lyons, J., R. Piette, T. Parks, A. Rypel, G. Sass, J. Kampa, and M. Mitro. (4 March 2014). Ask the experts. WDNR Live online chat about fish migration and research, Madison, WI.
- Lyons, J., A. Rypel, T. Burzynski, J. Myers, T. Paoli, and P. McIntyre. (25-27 February 2014). Effects of climate change on the reproductive phenology of two Great Lakes fishes. Wisconsin Chapter of the American Fisheries Society 2014 Annual Meeting, Green Bay, Wisconsin.

Research Presentations

- Lyons, J. (22-23 February 2014). Panel discussion on invasive species. Madison Fishing Expo, Madison, WI.
- Lyons, J. and M. Diebel. (14 February 2014). Fish-based stream classification for management and conservation. Science Services Open House, Madison, WI.
- Lyons, J. (12 February 2014). Climate change adaptation for stream fisheries. The Center for Limnology Seminar Series, Madison, WI.
- Lyons, J. (11 February 2014). Lecture on Wisconsin fish diversity. Ecology of Fishes Class at UW Madison, Madison, WI.
- McDonald, C. (10 April 2014). Natural wetlands as phosphorus filters. DNR Waterway and Wetland Protection & Dam and Floodplain Programs statewide meeting, Wausau, WI.
- McDonald, C. (14 February 2014). Nutrient trends and patterns in groundwater. Science Services Open House, Madison, WI.
- McKenna, Jr., J. E., J. M. Stewart, J. Lyons, and D. Infante. (5-7 February 2014). Tools for evaluation of climate change effects on fish habitat. Annual Meeting of the New York Chapter of the American Fisheries Society, Geneva, New York.
- Mikulyuk, A. (25 April 2014). Preparing Wisconsin invasive species policy for future climate change. Wisconsin Lakes Convention. Stevens Point, WI. Invited talk.
- Mikulyuk, A, K. Wagner, S. Van Egeren. (28 March 2014). Using the composition of aquatic macrophyte communities to assess ecological integrity. New England Association of Environmental Biologists Conference. Burlington, VT. Invited talk.
- Mikulyuk, A. (27 March 2014). What do the plants say? Using aquatic macrophytes to assess ecological integrity. New England Association of Environmental Biologists Conference. Burlington, VT. Invited plenary talk.
- Mitro, M. G., J. Lyons, J. Stewart, and S. Westenbroek. (1 April 2014). Climate change impacts on Wisconsin trout streams. Citizens' Climate Lobby-Central Wisconsin Chapter panel forum on "Climate Change and Wisconsin Hunting & Fishing", Stevens Point, Wisconsin. Invited talk.
- Mitro, M. (19 March 2014). Wisconsin DNR trout research. 2014 Orientation for new Fisheries Staff Meeting, Madison, WI.
- Mitro, M. G., and A. H. Fayram. (8 March 2014). Fishes of Wisconsin lakes and streams. Franklin/Randall Super Science Saturday, Madison Metropolitan School District, Madison, Wisconsin. Invited talk.
- Mitro, M. G., J. Lyons, J. Stewart, S. Westenbroek, L. Kammel, and C. Buchwald. (25-27 February 2014). Modeling and monitoring to understand climate change impacts on Wisconsin trout streams. Wisconsin Chapter of the American Fisheries Society 2014 Annual Meeting, Green Bay, Wisconsin. Poster presentation.
- Mitro, M., S. Marcquenski, K. Soltau and P. Kanehl. (25-27 February 2014). Gill lice as a proximate cause of brook trout loss under changing climatic conditions. Wisconsin Chapter of the American Fisheries Society 2014 Annual Meeting, Green Bay, Wisconsin.
- Mitro, M. (14 February 2014). Research to support inland trout fisheries. Science Services Open House, Madison, WI.
- Mitro, M. G. (4-5 February 2014). Monitoring gill lice and trout population dynamics in Wisconsin streams. 7th Annual Driftless Area Symposium, La Crosse, Wisconsin.
- Mitro, M. (21-22 January 2014). Gill lice distribution and monitoring update. 2014 WDNR Fisheries Biologist and Supervisors Meeting, Wausau, Wisconsin.

Research Presentations

- Nault, M. and J. Skogerboe. (25 April 2014). Scientific evaluation of efficacy and selectivity of herbicide treatments in Wisconsin Lakes. Poster Presentation. 2014 Wisconsin Lakes Convention, Steven's Point, WI.
- Nault, M., M. Barton, A. Mikulyuk, K. Wagner, and J. Hauxwell. (25 April 2014). Capturing a decade of aquatic plant research in Wisconsin. Poster Presentation. 2014 Wisconsin Lakes Convention, Steven's Point, WI.
- Nault, M. (24 April 2014). Panel discussion member on aquatic plant management research. 2014 Wisconsin Lakes Partnership Convention, Steven's Point, WI.
- Nault, M. (26 February 2014). Evaluation of statewide aquatic plant management. Wisconsin Lakes & Rivers Partnership Meeting, Weston, WI.
- Nault, M. (14 February 2014). Science to support statewide aquatic plant and invasive species management. Science Services Open House, Madison, WI.
- Nault, M. (12 February 2014). Evaluation of statewide aquatic plant management. Herbicide Research Meeting, Madison, WI.
- Nelson, K., D. Wahl, G. Sass. (28 January 2014). Competitive interactions between bighead carp and bluegill. Midwest Fish and Wildlife Conference, Kansas City, MO.
- Parks, T.P. and G. Gelwicks. (1 April 2014). Connectivity to Mississippi River and large reservoirs: implications when evaluating the environmental influence on fish assemblage structure in midwestern nonwadeable rivers. 26th Annual Spring Meeting of the American Fisheries Society, North Central Division, Rivers and Stream Technical Committee, Milan, IL.
- Parks, T. and J. Kampa. (25-27 February 2014). Long term patterns of white sucker reproductive phenology associated with climate change in northern Wisconsin Lakes. Wisconsin Chapter of the American Fisheries Society 43rd Annual Meeting, Green Bay, WI.
- Read, J. R., L. A. Winslow, G. J. A. Hansen, J. Van Den Hoek, P. Hanson, L. Bruce, C. Markfort. (22 May 2014). Simulating lakes in the landscape. Joint Aquatic Sciences Meeting, Portland, OR.
- Rose, K. C., G. J. A. Hansen, J. S. Read, L. A. Winslow. (19 May 2014). Modeling the effects of long term changes in water clarity on water temperature characteristics in north temperate lakes. Joint Aquatic Sciences Meeting, Portland, OR.
- Rypel, A. L., D. Goto, and M. J. Vander Zanden. (March 2014). Production characteristics of Wisconsin walleye fisheries. Update to Fisheries Management Board, Fitchburg, WI.
- Rypel, A. L. (March 2014). Long-term changes in the size structure and natural production of Wisconsin fisheries. Orientation for new Fisheries Management Staff Meeting, Madison, WI.
- Rypel, A. L. (March 2014). From bass to bivalves: how a changing world is changing our fisheries. Mississippi State University, Department of Wildlife, Fisheries and Aquaculture, Starkville, MS.
- Rypel, A. L. (February 2014). Long-term changes in panfish size structure in Wisconsin. Science Services Open House, Madison, WI.
- Rypel, A. L. (February 2014). Natural production rates of walleye in Escanaba Lake, 1965-2009, and their relationship to angler harvest. Science Services Open House, Madison, WI.
- Rypel, A. L. (January 2014). Panfish trends in size over time. WDNR Fisheries Biologist and Supervisors Meeting, Wausau, WI.
- Sass, G. (7 March 2014). Research overview of the Northern Highland Fisheries Research Area. Vilas County Board, Eagle River, WI.

Research Presentations

- Sass, G. and S. Newman. (25-27 February 2014). Abundance and growth responses of walleye to 35% annual exploitation on Big Crooked Lake, Wisconsin, 1998-2008. Wisconsin Chapter of the American Fisheries Society 2014 Annual Meeting, Green Bay, Wisconsin.
- Sass, G. (17 February 2014). Aquatic invasive species guest lecture. UW-Stevens Point Fisheries Management course, Stevens Point, WI.
- Sass, G. (14 February 2014). Sustainable walleye exploitation in Wisconsin. Science Services Open House, Madison, WI.
- Sass, G. (13 February 2014). Fish community and aquatic ecosystem responses to the cessation of Eurasian watermilfoil chemical treatment on Lake Ellwood, WI. Science Services Fisheries and Aquatic Sciences Section meeting, Madison, WI.
- Sass, G. (12 February 2014). Fish community and aquatic ecosystem responses to the cessation of Eurasian watermilfoil chemical treatment on Lake Ellwood, WI. Eurasian watermilfoil summit, Madison, WI.
- Sass, G. (10 February 2014). Proposed whole-lake study to the test for fish community and aquatic ecosystem responses the cessation of long-term Eurasian watermilfoil chemical treatments. Lake Ellwood Association, Florence, Wisconsin.
- Stewart, J., A. Covert, N. Estes, J. Bruce, S. Westenbroeck, D. Krueger, D. Wieferrich, M. Slattery, J. Lyons, J. McKenna, and D. Infante. (17-21 August 2014). FishVis: a regional decision support tool to map the response of riverine fish to climate change in the Great Lakes Region of the United States. Annual Meeting of the American Fisheries Society, Quebec City, Canada.
- Wagner, K., A. Mikulyuk, S. Van Egeren, J. Hauxwell. (3 June 2014). Landscape risk assessment of invasive aquatic plants in southeast Wisconsin ponds. Invited poster presentation. Great Lakes Briefs on Invasive Organisms Traded in Commerce, Milwaukee, WI.
- Wagner, K. I., C. Seeley-Schreck, A. Mikulyuk, S. Van Egeren, J. Hauxwell. (25 April 2014). Aquatic plants in trade: reducing the retail availability of invasives in Wisconsin. Poster presentation. Wisconsin Lakes Convention, Stevens Point, WI.
- Watras, C. J. (23 April 2014). Decadal oscillation of lakes and aquifers in the upper Great Lakes region of North America. Office of Great Lakes, WDNR.
- Watras, C. J. and T. Meinke. (27 January 2014). The Little Rock Lake project. WXPR Radio, Rhinelander WI.
- Woiak, Z., B. L. Sloss, J. A. VanDeHey, and M. J. Jennings. (25-27 February 2014). Realized genetic consequences of implementing conservation genetics practices in a muskellunge propagation program. Wisconsin Chapter of the American Fisheries Society 43rd Annual Meeting. Green Bay, WI.
- Wollenburg, E., M. Werner, G. LaLiberte, D. Perkins, and C. Hedman. (22-26 June 2014). Freshwater harmful algal bloom and related illness surveillance in Wisconsin: findings and implications. Council of State and Territorial Epidemiologists Annual Meeting, Nashville, TN.
- Wollenburg, E., M. Werner, G. LaLiberte, D. Perkins and C. Hedman. (13 March 2014). Harmful algal blooms in Wisconsin: results of a statewide public health surveillance program. American Water Resources Association – Wisconsin Section Annual Meeting, Wisconsin Dells, WI.

2013

- Barton, M., A. Mikulyuk, M. Nault, K. Wagner, J. Hauxwell, S. van Egeren, T. Asplund, J. Skogeboe, S. Jones, J. Leverance, and S. Graham. (18 November 2013). Early season 2,4-D herbicide and deep harvesting treatment effects on Eurasian watermilfoil (*Myriophyllum spicatum*) and native

Research Presentations

macrophytes in Turville Bay, Lake Monona, Dane County, Wisconsin. Dane County Public Information Meeting. Madison, WI.

Barton, M., A. Mikulyuk, J. Hauxwell, M. Nault, S. van Egeren, T. Asplund, S. Graham, S. Jones, J. Leverance, and J. Skogerboe. (10 April 2013). Early season 2,4-D herbicide and harvesting treatment effects on Eurasian watermilfoil in Turville Bay – Lake Monona, Dane County. Poster presented at 2013 Wisconsin Lakes Partnership Convention, Green Bay, WI.

Barton, M., A. Mikulyuk, J. Hauxwell, M. Nault, S. van Egeren, T. Asplund, S. Graham, S. Jones and J. Leverance, J. Skogerboe. (1 March 2013). Early season 2,4-D herbicide and harvesting treatment effects on Eurasian watermilfoil in Turville Bay – Lake Monona, Dane County. Poster presented at WDNR Science Services Open House, Madison, Wisconsin.

Butman, D. E., S. M. Stackpoole, D. W. Clow, R. G. Striegl, C. P. McDonald. (11 December 2013). A synthesis of freshwater carbon cycling for the conterminous US: does it matter for terrestrial carbon budgets? American Geophysical Union, Fall Meeting 2013, San Francisco, CA.

Diebel, M. (19 December 2013). Expected effects of the Rock River TMDL on total phosphorus concentrations in the Yahara Lakes. Public Meeting on Yahara Lakes Impairment Listing, Madison, WI.

Diebel, M., A. Ruesch, and D. Menuz. (25 November 2013). Introduction to WDNR's new waterbody and watershed attribute database, WDNR seminar, Madison, WI.

Diebel, M., A. Ruesch, D. Menuz, J. Stewart, and S. Westenbroek. (22 November 2013). Ecological limits of hydrologic alteration in Wisconsin streams. Wisconsin Groundwater Coordinating Council meeting, Madison, WI.

Diebel, M., S. Januchowski-Hartley, P. Doran, P. McIntyre. (7 November 2013). A model of road crossing passability for the Great Lakes Basin. UMGL LCC Fish Vulnerability to Climate Change workshop, Middleton, WI.

Diebel, M., T. Paoli, P. McIntyre, D. Oele, E. Childress, J. Maxted, A. Somor, A. Shaw, and N. Van Helden. (24 September 2013). Prioritizing barrier removal for northern pike spawning migration in Green Bay tributaries. Northern Pike Research Meeting. Green Bay, WI.

Diebel, M. (3 September 2013). Long-term trends in river water quality in Wisconsin. Wisconsin Nutrient Reduction Strategy Review Summit, Madison, WI.

Diebel, M., T. Neeson, P. McIntyre, S. Januchowski-Hartley, P. Doran, M. Ferris, and J. O'Hanley. (26 June 2013). Prioritizing barrier removal to restore native fish migrations in Great Lakes tributaries. International Conference on Engineering and Ecohydrology for Fish Passage, Corvallis, OR.

Diebel, M. (1 May 2013). Developing chlorophyll indicators for lakes. WDNR Biological Assessment Program Review Workshop, Madison, WI.

Diebel, M. and T. Asplund. (10 April 2013). Evolution of phosphorus criteria for lakes and reservoirs. Wisconsin Lakes Convention, Green Bay, WI.

Diebel, M. (6 April 2013). Nutrients in Wisconsin streams. Wisconsin Citizen-Based Monitoring Conference, Wisconsin Rapids, WI.

Diebel, M., T. Paoli, P. McIntyre, D. Oele, E. Childress, J. Maxted, A. Somor, A. Shaw, and N. Van Helden. (7 March 2013). Prioritizing barrier removal for northern pike spawning migration in Green Bay tributaries. WDNR Biologists Meeting, Treehaven, WI.

Diebel, M., A. Ruesch, and D. Menuz. (1 March 2013). You are what you drain: A high-resolution hydrologic database connecting freshwater with the surrounding landscape. WDNR Science Services Open House, Madison, WI.

Research Presentations

- Eslinger, L. and G. G. Sass. (5-7 February 2013). Dietary habits and overlap between walleye and smallmouth bass in the Turtle-Flambeau Flowage, Wisconsin. Wisconsin Chapter of the American Fisheries Society Annual Meeting, Rothschild, Wisconsin.
- Ferry, M., T. Ginnett, G. G. Sass, and K. Gauthier. (5-7 February 2013). Zebra mussel habitat preference, growth, and mortality within and among lakes in northeast Wisconsin and upper Michigan. Wisconsin Chapter of the American Fisheries Society Annual Meeting, Rothschild, Wisconsin.
- Garrison, P. (1 November 2013). Western coast of Lake Michigan water chemistry and cladophora growth. NALMS 33rd International Symposium, San Diego, CA.
- Garrison, P. and S. Greb. (1 November 2013). Lake Michigan cladophora shoreline survey results. NALMS 33rd International Symposium, San Diego, CA.
- Garrison, P. and C. Carlson. (31 October 2013). Comparison of Wisconsin's results from National Lake Assessments in 2007 and 2012. NALMS 33rd International Symposium, San Diego, CA.
- Garrison, P. (9 June 2013). Paleolimnology or history in the mucking. Cedar Lake Association Annual Meeting, Cedar Lake, WI.
- Garrison, P. (11 April 2013). What is paleolimnology and what does it tell me about my lake. In: Sorge, B., P. Cunningham and P. Garrison. Limnology 101: So you want to understand lakes? Workshop at Wisconsin Lakes Convention, Green Bay, WI.
- Garrison, P. (11 April 2013). The importance of a lake's watershed and understanding the importance of phosphorus loading. In: Sorge, B., P. Cunningham and P. Garrison. Limnology 101: So you want to understand lakes? Workshop at Wisconsin Lakes Convention, Green Bay, WI.
- Garrison, P. (11 April 2013). History in the mucking. 2013 Wisconsin Lakes Partnership Convention, Green Bay, WI.
- Garrison, P. (20 February 2013). Lake Superior and Lake Michigan nearshore monitoring summary. WI Great Lakes meeting, Wausau, WI.
- Gilbert, S. and G. G. Sass. (5-7 February 2013). Trends in Wisconsin's muskellunge fishery based on 47 years of angler entries from a single countywide contest. Wisconsin Chapter of the American Fisheries Society Annual Meeting, Rothschild, Wisconsin.
- Greb, S. (16 December 2013). Remote sensing of lakes. Group on Earth Observations Webinar (remote presentation).
- Greb, S., P. Garrison and G. LaLiberte. (17 October 2013). Spatial and temporal variability of water quality in nearshore areas of western Lake Michigan. Lake Michigan: State of the Lake Great Lakes Beach Conference.
- Gyawali, R. (19 September 2013). A hydro-climatic modeling framework for adaptive water resources management in the Great Lakes Basin. Dept. of Civil and Environmental Engineering, University of Wisconsin, Madison, WI.
- Gyawali, R. (16 September 2013). A hydro-climatic modeling framework for adaptive water resources management in the Great Lakes Basin. Wisconsin Water Science Center, U.S. Geological Survey, Middleton, WI.
- Haber, E. (10 April 2013). Making aquatic plant point-intercept survey data available in SWIMS and on DNR websites. 2013 Wisconsin Lakes Partnership Convention, Green Bay, WI. Poster presentation.
- Heath, E., T. Hoyman, M. Nault, J. Skogerboe. (5 March 2013). Field research of early-season 2,4-D applications for control of hybrid Eurasian water milfoil. Midwest Aquatic Plant Management Society Meeting. Cleveland, OH.

Research Presentations

- Hansen, G. (11 December 2013). Summary of modeled water column temperatures for 2500 Wisconsin Lakes from 1979-2011. Cisco working group meeting Spooner, WI.
- Hansen, G. (12 November 2013). Research updates to the Fisheries Management Board, Madison, WI.
- Hansen, G. (20 September 2013). Workshop on the food web modeling software Ecopath with Ecosim. DNR and UW scientists, Madison, WI.
- Hansen, G. (12 August 2013). Bass and walleye trends in Wisconsin. Joint bass team meeting of Wisconsin and Minnesota, Hudson, WI.
- Hansen, G. J. A., S. R. Carpenter, J. W. Gaeta, and M. J. Vander Zanden. (24 July 2013). Trends in Wisconsin's black bass and walleye populations: what we know, what we don't know, and what we can do about it. North Central Division American Fisheries Society Meeting, Wausau, WI.
- Hansen, G. J. A., M. J. Vander Zanden, and A. W. Latzka. (21 June 2013). Commonly rare and rarely common: distribution, abundance, and impacts of aquatic invasive species. Northwest Wisconsin Lakes Conference, Spooner, WI.
- Hansen, G. (18 December 2013). The model used to predict the probability of walleye natural recruitment for Wisconsin Lakes. The Walleye Team, Wausau, WI.
- Hauxwell, J. (11 November 2013). Research priorities and process. Water Resources PMT, Woodruff, WI.
- Havel, J. E., L. A. Bruckerhoff, and S. Knight. (17-22 February 2013). Secondary spread of invasive aquatic plants depends on survival time during air exposure. 2013 Association for the Sciences of Limnology and Oceanography Annual Meeting, New Orleans, LA.
- Jennings, M., G. Hatzenbeler, and J. Kampa. (1 March 2013). Status of two threatened redhorse (*Moxostoma*) species in the Upper St. Croix River. Poster presented at WDNR Science Services Open House, Madison, Wisconsin.
- Jennings, M. and J. Kampa. (5-7 February 2013). Muskellunge size structure changes and angler perceptions in the Spider Lake Chain. Wisconsin Chapter of the American 42nd Annual Meeting, Rothschild, WI.
- Kampa, J. M., G. R. Hatzenbeler, and M. J. Jennings. (21-25 July 2013). Status and management of lake sturgeon in the upper St. Croix River and Namekagon River, Wisconsin, USA. World Sturgeon Conservation Society 7th International Symposium on Sturgeon, Nanaimo, BC, Canada.
- Kampa, J. (23 May 2013). Presented Lake Sturgeon conservation across the Great Lakes region with special emphasis on the Namekagon and St. Croix River. St. Croix River Association, Namekagon Paddle Event, Trego, WI.
- Kampa, J., G. Hatzenbeler, J. Wendel and M. Jennings. (16 March 2013). Lake sturgeon restoration program on the Namekagon River. Hayward Fishing Expo, Hayward, WI.
- Kampa, J., G. Hatzenbeler, J. Wendel and M. Jennings. (1 March 2013). Status of lake sturgeon restoration in the Namekagon River, Wisconsin. Poster presented at WDNR Science Services Open House, Madison, Wisconsin.
- Kampa, J., G. Hatzenbeler, J. Wendel and M. Jennings. (5-7 February 2013). Status of lake sturgeon restoration in the Namekagon River, Wisconsin. Wisconsin Chapter of the American Fisheries Society 42nd Annual Meeting, Rothschild, WI.
- Kampa, J., G. R. Hatzenbeler, and M. J. Jennings. (19 January 2013). Lake sturgeon in the Upper St. Croix and Namekagon Rivers: Status and Restoration. National Park Service 2013 Riverway Speaker Series, St. Croix River Visitor Center, St. Croix Falls, Wisconsin.

Research Presentations

- Knight, S. E., T. K. Kratz, and C.J. Watras. (September 2013). Lessons learned from Little Rock Lake. Route 51 Radio Program, Wisconsin Public Radio.
- Knight, S. E. (August 2013). Aquatic plant ecology. Washburn Lakes Lake Association, Spooner, WI.
- Knight, S. E. (August 2013). Plant ID and ecology. Trout Lake Station open house.
- Knight, S. E. (August 2013). Plant ID and ecology. Trees for tomorrow timber fest.
- Knight, S. E. (September 2013). Aquatic plant identification and ecology. Lakeland Union High School botany class.
- Knight, S. E. (July-September 2013). Bog walks for the Trout Lake Summer Seminar series and UW-Limnology students.
- Knight, S. E. (February through December 2013). Science on tap-Minocqua. Moderator. Monthly science presentations to the public.
- Knight, S. E., M. Barton, and M. Nault, P. Skawinski. (June 2013). Plant identification, Kemp Natural Resources Station, Woodruff, WI.
- Knight, S., M. Nault, M. Barton, K. Wagner and P. Skawinski. (9 April 2013). Aquatic macrophyte identification workshop. Wisconsin Lakes Convention, Green Bay, WI.
- Knight, S. E., L. Bruckerhoff and J. E. Havel. (April 2013). Tolerance of air exposure and its impact on dispersal of aquatic invasive species. Wisconsin Lakes Convention, Green Bay, WI.
- Knight, S. E. (March 2013). Bog ecology. Citizen Lake Monitoring Network, Spooner, WI.
- Kratz, T. K., J. W. Gaeta, G. J. A. Hansen, N. R. Lottig, J. R. Read, E. H. Stanley, J. F. Walker, and C. J. Watras. (5 August 2013). Long-term studies as frameworks for peering into the future: climate forcing and ecological response in a set of Wisconsin lakes. Ecological Society of America, Annual Meeting, St. Paul, MN.
- Krueger, D. M., J. M. Stewart, L. Wang, D. Infante, J. Lyons, J. McKenna, K. Wehrly, A. Covert, D. Wieferich, S. Westenbroek, S. Niemela, M. Mitro, J. Bruce, and N. Estes. (1-5 April 2013). Assessing Midwest stream fish habitat in the face of a changing climate: an adaptive management approach using the FishVis mapping tool. 1st Annual National Adaptation Forum, Denver, Colorado.
- LaLiberte, G., S. Van Egeren, T. Ossman, and E. Wollenburg. (30 July 2013). Blue-green algae "Ask the Experts" chat, Madison, WI. <http://dnr.wi.gov/chat/expert.html>
- LaLiberte, G., D. Dinsmore, A. Mednick, and T. Ossman. (27 June 2013). Beach monitoring "Ask the Experts" online chat, Madison, WI. <http://dnr.wi.gov/chat/expert.html>
- LaLiberte, G. (25-26 June 2013). Field identification of algae. Aquatic Plant Identification Workshops, Kemp Natural Resources Station, Woodruff, WI.
- LaLiberte, G.D. and E. Wollenburg. (25 June 2013). Health risks of exposure to blue-green algal blooms and response guidance for public health officials in Wisconsin. Presented to public health officials from Vilas, Oneida, Florence, Forest, and Iron Counties, Rhinelander, WI.
- LaLiberte, G. D. and E. Wollenburg. (23 May 2013). Health risks of exposure to blue-green algal blooms and response guidance for public health officials in Wisconsin. Wisconsin Public Health Association and WI Association of Local Health Departments and Boards 2013 Conference, Wisconsin Dells, WI.
- LaLiberte, G. D. and E. Wollenburg. (9 April 2013). Harmful algal blooms in Wisconsin waters 2009-2012. Wisconsin Lakes Convention, Green Bay, WI.
- LaLiberte, G. D. (14 March 2013). Blue-green algae: the effects of their blooms in Wisconsin waters. Red Cedar Watershed Conference, Menomonie, WI.

Research Presentations

- LaLiberte, G. (1 March 2013). Wisconsin's harmful algal bloom surveillance program: 2009-2012 results. Poster presented at WDNR Science Services Open House, Madison, Wisconsin.
- Liss, S. A., G. G. Sass, and C. D. Suski. (24-26 April 2013). Spatial and temporal influences on the physiological condition of invasive silver carp. Annual Meeting of the Mississippi River Research Consortium, LaCrosse, Wisconsin.
- Lamer, J. T., G. G. Sass, J. M. Epifanio, M. A. McClelland, and B. C. Ruebush. (8-12 September 2013). Asian carp hybridization: prevalence, distribution, and post-zygotic success in the Mississippi River Basin. 143rd Annual Meeting of the American Fisheries Society, Little Rock, Arkansas.
- Lamer, J. T., G. G. Sass, J. M. Epifanio, M. A. McClelland, and B. C. Ruebush. (24-26 April 2013). Asian carp hybridization: prevalence, distribution, and post-zygotic success in the Mississippi River basin. Annual Meeting of the Mississippi River Research Consortium, LaCrosse, Wisconsin.
- Lathrop, R. (5 December 2013). Linking science and management for reducing blue-green algal blooms in the Yahara Lakes. UW-Madison Introduction to Limnology course Guest Lecture, Madison, WI.
- Lathrop, R. (24 January 2013). Linking science and management for reducing blue-green algal blooms in the Yahara Lakes. UW-Madison Institute of Environmental Studies course, Madison, WI.
- Lyons. (7 November 2013). Fish vulnerability analysis. Fish Vulnerability to Climate Change workshop, Middleton, WI.
- Lyons, J. (September 2013). Methods to capture fishes from Wisconsin's waters. Lecture and field demonstration for University of Wisconsin class "Natural History Museums", Madison, WI.
- Lyons, J., and J. M. Stewart. (21-25 July 2013). Predicted effects of future climate warming on thermal habitat suitability for lake sturgeon in Wisconsin rivers. Seventh International Sturgeon Symposium, Nanaimo, British Columbia.
- Lyons, J. (1 May 2013). Stream natural communities: applications for bioassessment. Presentation during U.S. Environmental Protection Agency review of the Wisconsin DNR biomonitoring program, Madison, WI.
- Lyons, J. (19 March 2013). The diversity of Wisconsin's fishes: past, present, and future. Lecture in University of Wisconsin class "Ecology of Fishes", Madison, WI.
- Lyons, J. (6-7 March 2013). Validating/modifying stream natural community classifications with field data. Presentation given to the Wisconsin Department of Natural Resources Annual water Quality Biologists Training Session, Tomahawk, WI.
- Lyons, J. (1 March 2013). Summarizing everything that is known about Wisconsin fishes in an easily accessible online format: the *Fishes of Wisconsin* project. Poster at the annual Wisconsin Department of Natural Resources Bureau of Science Services Biennial Training Session, Madison, WI.
- Lyons, J., and J. M. Stewart. (26-28 February 2013). FishVis: A web-based system for visualizing predicted effects of climate change on stream fishes in the Great Lakes region. Wisconsin Department of Natural Resources Fisheries Management Biennial Training Session, Wisconsin Dells, WI.
- Lyons, J., and J. M. Stewart. (5-7 February 2013). FishVis: A web-based tool for predicting responses of stream fishes and their habitats to climate change in the Great Lakes region. Wisconsin Chapter of the American Fisheries Society, Wausau, WI.
- McDonald, C. (8 November 2013). Exploratory research on nutrient dynamics in the Yahara lakes. Water Division Managers meeting, Madison, WI.

Research Presentations

- McDonald, C. P. (10 October 2013). Nutrient dynamics in surface and ground waters of Dane County. UW Water Resources graduate seminar, Madison, WI.
- McDonald, C. (7 March 2013). Does nitrogen play a role in the water quality of WI lakes? DNR Annual Meeting of Biologists, Treehaven, WI.
- McDonald, C. (1 March 2013). How many lakes are (really) in Wisconsin? Science Services 2013 open house, Madison, WI.
- McDonald, C. (17-22 February 2013). CO₂ emissions from lakes and reservoirs in the contiguous United States. The Association for the Sciences of Limnology and Oceanography Aquatic Sciences 2013 meeting, New Orleans, LA.
- Mikulyuk, A. (8 August 2013). They're not [just] weeds! Discovering aquatic macrophyte communities. Clean Lakes Alliance Yahara 101 Lecture Series, Madison, WI.
- Mikulyuk, A., S. Van Egeren, K. Wagner, E. Haber. (11 March 2013). Using aquatic macrophytes to assess lake biotic integrity. Minnesota DNR Fisheries Research Meeting, St. Cloud, MN.
- Mitro, M. (12 November 2013). Update on Fishers & Farmers Fish Habitat Partnership; Wisconsin Initiative on Climate Change Impacts Fish & Fisheries Working Group and working group council meeting; and Ash Creek trout research. Fisheries Management Board Meeting, Madison, Wisconsin.
- Mitro, M. (18 October 2013). Modeling and monitoring to understand climate change impacts on Wisconsin streams. Poster at the UW Center for Climatic Research/Nelson Institute 50th Anniversary, Madison, Wisconsin.
- Mitro, M. G., S. Marcquenski, K. Soltau, P. Kanehl, D. Walchak, J. Haglund, E. Struck, and A. Nolan. (26-27 March 2013). Gill lice infection of brook trout in Driftless Area streams in Wisconsin. 6th Annual Driftless Area Symposium, La Crosse, Wisconsin. Invited talk.
- Mitro, M. G., J. Lyons, J. Stewart, and S. Westenbroek. (20 March 2013). Climate change impacts on Driftless Area trout streams: observations, projections, and adaptation strategies. 6th Annual Driftless Area Symposium, La Crosse, Wisconsin. Invited talk.
- Mitro, M. G. (13 March 2013). Adaptation in action: putting climate change adaptation strategies to work for fisheries and wildlife. Climate Academy Webinar, USFWS. Invited talk.
- Mitro, M. G., and A. H. Fayram. (9 March 2013). Fishes of Wisconsin lakes and streams. Franklin/Randall Super Science Saturday, Madison Metropolitan School District, Madison, Wisconsin. Invited talk.
- Mitro, M. G., S. Marcquenski, K. Soltau, P. Kanehl, D. Walchak, J. Haglund, E. Struck, and A. Nolan. (1 March 2013). Gill lice infection of brook trout in Wisconsin streams. Poster presented at WDNR Science Services Open House, Madison, Wisconsin.
- Mitro, M. G., J. Petchenik, S. Stewart, and M. Engel. (27 February 2013). Review of Wisconsin's trout program: online and public meeting survey. WDNR Fisheries Management Statewide Meeting, Wisconsin Dells, Wisconsin. Invited talk.
- Mitro, M. G., S. Marcquenski, K. Soltau, P. Kanehl, D. Walchak, J. Haglund, E. Struck, and A. Nolan. (26-27 February 2013). Gill lice infection of brook trout in Wisconsin streams. Poster presented at WDNR Fisheries Management Statewide Meeting, Wisconsin Dells, Wisconsin.
- Mitro, M. G., S. Marcquenski, K. Soltau, P. Kanehl, D. Walchak, J. Haglund, E. Struck, and A. Nolan. (6-7 February 2013). Gill lice infection of brook trout in Wisconsin streams. Wisconsin Chapter of the American Fisheries Society 2013 Annual Meeting, Wausau, Wisconsin.

Research Presentations

- Morrison, K., J. Rubsam, C. Watras, P. Hanson, M. Morrow, and Y. H. Hu. (1 March 2013). Wireless sensor networks for environmental monitoring (www.wetlands.gleon.org). Poster presented at WDNR Science Services Open House, Madison, Wisconsin.
- Moody, C. J., L. D. Franklin, G. G. Sass, and R. E. Colombo. (8-12 September 2013). Flathead catfish gear assessments and demographics in the Wabash River. 143rd Annual Meeting of the American Fisheries Society, Little Rock, Arkansas.
- Morrison, K. (20 February 2013). Evaporation research and lake levels – recent research. Lakes Partnership Meeting, Boulder Junction, WI.
- Myers, B., C. A. Dollof, J. R. Webster, and A. L. Rypel. (September 2013). Macroecological variations in stream community fish production across the southern Appalachian Mountains: implications for climate change. Annual Meeting of the American Fisheries Society, Minneapolis, MN.
- Myers, B., C. A. Dollof, and A. L. Rypel. (January 2013). Variations in community fish production across the southern Appalachians: implications for climate change. 21st Annual Meeting of the Southern Division of the American Fisheries Society, Nashville, TN.
- Nault, M. (6 December 2013). Statewide aquatic plant management research. UW-Stevens Point Fisheries and 2,4-D Research Proposal Meeting, Stevens Point, WI.
- Nault, M., S. van Egeren. (12 November 2013). Evaluation of statewide aquatic plant research. Golden Lake Association Meeting, Summit Village Hall, Oconomowoc, WI.
- Nault, M. (10 April 2013). Evaluation of statewide Eurasian watermilfoil research. 2013 Wisconsin Lakes Partnership Convention, Green Bay, WI.
- Nault, M., J. Skogerboe. (11 March 2013). Utilizing science to guide Aquatic Plant Management in Wisconsin. EWM Research Meeting. Rhinelander, WI.
- Nault, M., M. Barton, J. Hauxwell, K. Wagner, and A. Mikulyuk. (7 March 2013). Utilizing science to guide Aquatic Plant Management in Wisconsin. Wisconsin DNR Biologists Meeting, Tomahawk, WI.
- Nault, M., M. Barton, J. Hauxwell, A. Mikulyuk, K. Wagner, and J. Skogerboe. (1 March 2013). Science to support strategic investment in invasives prevention & management. Poster presented at WDNR Science Services Open House, Madison, Wisconsin.
- Nault, M., M. Barton, K. Wagner, A. Mikulyuk, and J. Hauxwell. (20 February 2013). Aquatic macrophyte research in Wisconsin. Annual Lakes Partnership Research Summaries. Wisconsin Lakes Partnership Meeting, Boulder Junction, WI.
- Nault, M. and J. Skogerboe. (23 January 2013). Aquatic macrophyte research in Wisconsin. Aquatic Plant Management Training Meeting. Spooner, WI.
- Nelson, K., D. H. Wahl, and G. G. Sass. (8-12 September 2013). Competitive interactions between bighead carp and bluegill. 143rd Annual Meeting of the American Fisheries Society, Little Rock, Arkansas.
- Perkins, D., C. Hedman, G. LaLiberte, E. Wollenburg, and M. Werner. (19 November 2013). Harmful algal blooms in Wisconsin: results of a statewide public health surveillance program. Society of Environmental Toxicology and Chemistry North America Annual Meeting, Nashville, TN.
- Pracheil, B. M., P. McIntyre, and J. Lyons. (8-12 September 2013). Connectivity of large-river networks is important throughout fish life history. Annual Meeting of the American Fisheries Society, Little Rock, Arkansas.
- Read, J. S. and G. J. A. Hansen. (15 November 2013). Simulating Wisconsin's managed lakes. Science Services Seminar Series, Madison, WI.

Research Presentations

- Read, J. S. and G. J. A. Hansen. (7 November 2013). Simulating Wisconsin's managed lakes. UMGL LCC Fish Vulnerability to Climate Change workshop, Middleton, WI.
- Rypel, A. L. (November 2013). Update to Fisheries Management Board on panfish and walleye research. Madison, WI.
- Rypel, A. L., J. Lyons, and J. D. Griffin. (August 2013). Long-term decline in bluegill size structure and growth rates in Wisconsin: evidence for genetic parental effects? 98th Annual Meeting of the Ecological Society of America. Minneapolis, MN.
- Rypel, A. L. (August 2013). Defining "the why" – a perspective on maximizing the impact of fish conservation efforts. National Fish and Wildlife Foundation, Washington D.C.
- Rypel, A. L. (March 2013). The ecosystems they area a-changing or how fisheries are reacting to an increasingly modified world. University of Wisconsin, Center for Limnology, Madison, WI.
- Rypel, A. L. (1 March 2013). A retrospective on size structure changes of sportfishes in Wisconsin. WDNR Science Services statewide meeting, Madison, WI.
- Runde, B. J., B. Myers, and A. L. Rypel. (February 2013). Secondary production of fish assemblages along a land use gradient in an Appalachian Mountain stream. Virginia Chapter Meeting of the American Fisheries Society, Lexington, VA.
- Sass, G. (8 October 2013). Research overview to the Vilas County Lakes and Rivers Association, St. Germain, WI.
- Sass, G. G., J. F. Hansen, J. W. Gaeta, G. A. Hansen, D. A. Isermann, J. Lyons, and M. J. Vander Zanden. (8-12 September 2013). Largemouth bass management in Wisconsin: intra- and inter-specific implications of abundance increases. 143rd Meeting of the American Fisheries Society, Little Rock, Arkansas.
- Sass, G. (20 February 2013). UW-Stevens Point invited guest lecture on invasive species. Stevens Point, WI.
- Smith, M., R. Myers, J. Hoenig, N. Kmiecik, M. Luehring, M. Drake, P. Schmalz, and G. G. Sass. (8-12 September 2013). Determining size- and sex-specific capture and harvest selectivity for walleye. 143rd Annual Meeting of the American Fisheries Society, Little Rock, Arkansas.
- Van Middlesworth, T. D., N. N. Michaels, G. G. Sass, B. A. Ray, and T. W. Spier. (8-12 September 2013). Is there a native recipe for controlling common carp? 143rd Annual Meeting of the American Fisheries Society, Little Rock, Arkansas.
- Wagner, K. and C. Schreck. (10 April 2013). Invasive aquatic plants in trade: quantifying availability and risk to Wisconsin waters. 2013 Wisconsin Lakes Partnership Convention, Green Bay, WI.
- Wagner, K. I., E. Haber, A. Mikulyuk. (1 March 2013). Landscape risk assessment of invasive aquatic plants in southeast Wisconsin ponds. Wisconsin DNR Science Open House Poster Presentation, Madison, WI.
- Wagner, K. and C. Schreck. (22 February 2013). Working with live plant retailers to reduce the availability of aquatic invasive plants in Wisconsin. Oral and webcast presentation. DNR Science Services Seminar Series in Madison, WI.
- Watras, C. J., T. Kratz and S. Knight. (5 September 2013). The Little Rock Lake Project. WPR Radio, Glen Moburg Show, Stevens Point, WI.
- Watras, C. J. (2013). The Little Rock Lake Project. WJFW TV, Rhinelander WI.
- Watras, C. J. (31 July 2013). The Little Rock Lake Project. WPR Radio, Larry Meiller Show, Madison WI.

Research Presentations

- Watras, C. and J. Rubsam. (1 March 2013). A citizen science program for monitoring lake stages in Northern Wisconsin: 2008-2012 results. Poster presented at WDNR Science Services Open House, Madison, Wisconsin.
- Watras, C., J. Read, S. Morgan, Z. Liu, E. Stanley, and Y. Song. (1 March 2013). Water level oscillation in the Upper Great Lakes Region: 1942-present. Poster presented at WDNR Science Services Open House, Madison, Wisconsin.
- Weberg, M. A., J. R. Copeland, B. R. Murphy, and A. L. Rypel. (February 2013). Cross-population comparisons of grass carp growth: implications for hydrilla management in an Appalachian Reservoir. Virginia Chapter Meeting of the American Fisheries Society, Lexington, VA.
- Weberg, M. A., J. R. Copeland, B. R. Murphy, and A. L. Rypel. (January 2013). Cross-population comparisons of grass carp growth: implications for hydrilla management in an Appalachian Reservoir. 21st Annual Meeting of the Southern Division of the American Fisheries Society, Nashville, TN.
- Woiak, Z., B. Sloss, J. VanDeHey, and M. Jennings. (5-7 February 2013). Genetic diversity of hatchery-reared muskellunge: impacts of propagation. Wisconsin Chapter of the American Fisheries Society 42nd Annual Meeting, Rothschild, WI.

2012

- Barton, M., A. Mikulyuk, M. Nault, J. Skogerboe, K. Wagner, J. Hauxwell, and S. van Egeren. (30 October 2012). Chemical and mechanical treatments on Eurasian watermilfoil abundance: implications for management. The Upper Midwest Invasive Species Conference (UMISC), LaCrosse, WI.
- Bruckerhoff, L., S. E Knight, and J. E. Havel. (October 2012). Survival of invasive aquatic plants after air exposure during simulated overland dispersal. Upper Midwest Invasive Species Conference, La Crosse, WI.
- Catalano, M. J., I. Tsehay, B. M. Roth, and G. G. Sass. (19-23 August 2012). Forecasting the responses of bighead and silver carp populations to commercial harvest in the Illinois River. 142nd Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- Chick, J. H., C. Dolan, and G. G. Sass. (19-23 August 2012). An assessment of the relationship between electrofishing catch-per-unit-effort data and fish abundance. 142nd Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- Diebel, M. (14 November 2012). Ecological limits of hydrologic alteration in Dane County streams. Capitol Area Planning Conference, Madison, WI.
- Diebel, M., T. Asplund, and A. Minks. (8 November 2012). Methods for developing site-specific phosphorus criteria for Wisconsin lakes. North American Lake Management Society Annual Meeting, Madison, WI.
- Diebel, M. (10 October 2012). How to reconnect your watershed. Wisconsin Association for Floodplain, Stormwater, and Coastal Management Conference, Madison, WI.
- Diebel, M. (22 August 2012). Roles of aquatic habitat connectivity in the life cycles of Great Lakes fishes. American Fisheries Society annual meeting, St. Paul, MN.
- Ferry, M., T. Ginnett, G. Sass. (7-9 November 2012). Examining zebra mussel habitat preference and population dynamics within and among lakes in northeast Wisconsin and upper Michigan. North American Lake Management Society meeting, Madison, WI.
- Ferry, M., T. Ginnett, G. G. Sass, and K. Gauthier. (29-31 October 2012). Examining zebra mussel habitat preference and population dynamics in northeast Wisconsin and upper Michigan. Upper Midwest Invasive Species Conference, LaCrosse, Wisconsin.

Research Presentations

- Gaeta, J. W., Z. J. Lawson, G. G. Sass, and S. R. Carpenter. (19-23 August 2012). Effects of climate-driven water level loss on fish habitat availability, predator-prey interactions, population dynamics, and behavior in two north temperate lake basins. 142nd Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- Garrison, P. (17 December 2012). Lake Michigan nearshore monitoring. Lake Michigan symposium at the Institute for Freshwater Sciences.
- Garrison, P. (14 November 2012). Practical use of algal studies. Presented to Dr. Bob Pillsbury's algal ecology class, University of Wisconsin-Oshkosh, Oshkosh, WI.
- Garrison, P., S. Kaplan, G. LaLiberte. (7 November 2012). Does a warmer, drier climate mean more seepage lakes? North American Lake Management Society meeting, Madison, WI.
- Garrison, P. (16 October 2012). Dunes Lake sediment core results. Citizen Committee for the Management of Dunes Lake, Sevastopol, WI.
- Garrison, P. (21 September 2012). Paleolimnology as a lake management tool. Lake Leaders Institute, Lake Tomahawk, WI
- Greb, S. (18 December 2012). Update on water clarity measurements. Citizen Lake Monitoring Network, Wausau, WI.
- Greb, S., and E. Erdmann. (8 November 2012). The use of satellite remote sensing for lake monitoring in Wisconsin. North American Lake Management Society meeting, Madison, WI.
- Hoffman, A., D. Armstrong, and R. Lathrop. (7 November 2012). Iron scavenging as a natural control of internal phosphorus loading in contrasting dimictic Wisconsin lakes. North American Lake Management Society meeting, Madison, WI.
- Jennings, M. and J. Kampa. (9 October 2012). Fisheries Research program update. Meeting of the Northern Region Management Team, Spooner, WI.
- Jennings, M. J., G. R. Hatzenbeler, and J. M. Kampa. (18-19 August 2012). Distribution, age, and growth of redhorse in the upper St. Croix River. American Fisheries Society 142nd Annual Meeting, St. Paul, Minnesota.
- Kampa, J. (14 November 2012). Presented an update on lake sturgeon sampling on the Namekagon River and St. Croix River at the St. Croix National Scenic Riverway Networking Meeting, Wisconsin Canoe Heritage Museum, Spooner, WI.
- Kampa, J., G. Hatzenbeler, J. Wendel, and M. Jennings. (16 October 2012). Status of lake sturgeon restoration in the Namekagon River, Wisconsin. Twenty-Four Annual St. Croix River Research Rendezvous, Science Museum of Minnesota, Warner Nature Center, Marine on St. Croix, MN.
- Kampa, J. (16 August 2012). Stocking assessments. WDNR Fish Management New Employee Orientation Training. Hayward, Wisconsin.
- Knight, S. E. (October 2012). Aquatic invasive species at Nicolet College (for area middle school students).
- Knight, S. E. (September 2012). Aquatic plant identification and ecology. Lake Minocqua/Kawaguesaga Lake Association Annual Meeting.
- Knight, S. E. (September 2012). Lakeland Union High School botany class: aquatic plant identification and ecology.
- Knight, S.E. (August 2012). Trout Lake Station Open House: plant ID and ecology.
- Knight, S. E. (August 2012). Trees for Tomorrow Timber Fest: plant ID and ecology.

Research Presentations

- Knight, S. E. (July-September 2012). Bog walks for the Trout Lake summer seminar series and UW-Limnology students.
- Knight, S. E. (July 2012). Aquatic plant identification and ecology. Lake Tomahawk Lake Fest, Kemp Natural Resources Station, Woodruff, WI.
- LaLiberte, G. D. (14 November 2012). Real world algae questions, concerns, and applications at the Wisconsin Department of Natural Resources. Presented to Dr. Bob Pillsbury's algal ecology class, University of Wisconsin-Oshkosh, Oshkosh, WI.
- LaLiberte, G., D. Perkins, M. Werner, and E. Wollenburg. (7 November 2012). A multi-agency approach to measuring the public health burden of harmful algal blooms. North American Lake Management Society meeting, Madison, WI.
- LaLiberte, G. (23 July 2012). Hazard communication for the WDNR Science Operations Center: supplement to online training, Madison, WI.
- LaLiberte, G. (23 July 2012). Laboratory safety for the WDNR Science Operations Center, Madison, WI.
- Lamer, J. T., G. G. Sass, J. Epifanio, B. C. Ruebush, T. L. Tobias, and M. A. McClelland. (19-23 August 2012). Asian carp hybridization: prevalence, distribution, and fitness in the Mississippi River Basin. 142nd Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- Lathrop, R. (12 December 2012). Wisconsin's changing climate: impacts and adaptation. UW-Madison Environmental Engineering course Guest Lecture, Madison, WI.
- Lathrop, R. (7 December 2012). Linking science and management for reducing blue-green algal blooms in the Yahara Lakes. UW-Madison Introduction to Limnology course Guest Lecture, Madison, WI.
- Lathrop, R. (9 November 2012). Linking science and management for reducing blue-green algal blooms in the Yahara Lakes. Plenary talk of the North American Lake Management Society, Madison, WI.
- Lathrop, R., S. Carpenter, K. Connors, D. Heilman, and M. Malott. (9 November 2012). Panel discussion moderated by Susan Jones, Dane County Office of Lakes and Watersheds. Special session: Yahara Lakes: implementing a vision. North American Lake Management Society meeting, Madison, WI.
- Lathrop, R. (7 November 2012). Bottom water withdrawal in Devil's Lake: combining science and engineering to solve multiple lake management problems. North American Lake Management Society meeting, Madison, WI.
- Lyons, J. (4 December 2012). Research project overview. Presentation given to Wisconsin DNR Fisheries Management Policy Board, Madison, WI.
- Lyons, J. (15 November 2012). Development of multimetric biotic indices (IBI's) to assess aquatic ecosystem integrity in Wisconsin. Lecture given to the Stream Ecology Class, Wisconsin Lutheran College, Wauwatosa, WI.
- Lyons, J., N. Utrup, and J. A. Morton. (31 October 2012). Fish passage at the Prairie du Sac Dam on the Lower Wisconsin River. Presentation given to staff of Alliant Energy, the U.S. Fish and Wildlife Service, and the Wisconsin Department of Natural Resources, Fitchburg, WI.
- Lyons, J. (19 September 2012). Methods to capture fishes from Wisconsin's waters. Lecture and field demonstration for University of Wisconsin class "Natural History Museums", Madison, WI.
- Lyons, J., N. Utrup, and J. A. Morton. (19-23 August 2012). Sturgeon and paddlefish restoration through implementation of fish passage at the Prairie du Sac Dam on the Wisconsin River. Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- McDonald, C. (8 November 2012). Using high-resolution geospatial data to advance understanding of the abundance and size distribution of lakes. NALMS 2012 Symposium, Madison, WI.

Research Presentations

- McDonald, C. (31 October 2012). The influence of hydrologic inorganic carbon loading on lacustrine carbon cycling. The UW Center for Limnology seminar series, Madison, WI.
- Mikulyuk, A., K. Wagner and J. Hauxwell. (12 December 2012). Using aquatic macrophytes to assess lake biotic integrity. Presentation at Limnology and Marine Sciences Seminar Series, Center for Limnology, Madison WI.
- Mikulyuk, A., K. Wagner, J. Hauxwell, S. Sharma, S. Van Egeren, E. Erdmann, and M. Nault. (9 November 2012). Assessing impairment in aquatic macrophytes considering environmental and spatial constraints. North American Lake Management Society, Madison, WI.
- Mitro, M. G., P. Kanehl, D. Walchak, and E. Struck. (19-23 August 2012). Viability of a brook trout source population used for egg collection in Wisconsin's wild trout stocking program. American Fisheries Society 142nd Annual Meeting, Minneapolis-St. Paul, Minnesota.
- Mitro, M. G. (19-23 August 2012). GIS-based modeling assists Fishers & Farmers Partnership with strategic habitat conservation. American Fisheries Society 142nd Annual Meeting, Minneapolis-St. Paul, Minnesota. Invited talk.
- Mitro, M. G., P. Kanehl, D. Walchak, and E. Struck. (15-19 July 2012). Survival and recruitment in a brook trout source population used for egg collection in Wisconsin's wild trout stocking program. 10th International Congress on the Biology of Fish, Madison, Wisconsin.
- Moody, C. J., L. Frankland, G. G. Sass, and R. E. Colombo. (19-23 August 2012). A tale of the Wabash River flathead catfish: sampling inefficiencies and demographics. 142nd Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- Nault, M. and J. Skogerboe. (5 December 2012). Evaluation of herbicide applications for control of aquatic invasive species. Aquatic Plant Management in the Ceded Territory, Voight Task Force, Hayward, WI.
- Nault, M. and M. Barton. (28 November 2012). Vegetative and bathymetric lake mapping using CI BioBase hydroacoustic equipment. Lake Technical Team Meeting, Spooner, WI
- Nault, M. and J. Skogerboe. (14 November 2012). Update on aquatic plant research in Wisconsin. Aquatic Plant Management Applicator/Industry Meeting, Oshkosh, WI.
- Nault, M. (9 November 2012). Evaluation of herbicide applications for control of Eurasian watermilfoil (*Myriophyllum spicatum*). North American Lake Management Society Meeting, Madison, WI.
- Nault, M., J. Skogerboe, T. Asplund, J. Hauxwell, and M. Barton. (30 October 2012). Evaluation of herbicide applications for control of Eurasian watermilfoil (*Myriophyllum spicatum*). The Upper Midwest Invasive Species Conference (UMISC), La Crosse, WI.
- Nault, M. and J. Hauxwell. (22 October 2012). Aquatic plant and algae species assessment group (SAG) recommended NR40 rankings. The Wisconsin Council on Invasive Species, Fitchburg, WI.
- Nault, M. and J. Hauxwell. (18 September 2012). Results of Governor's Council Aquatic Plants and Algae Species Assessment Group for classifying 42 new or previously-classified "caution" species: Research & Regulations Committee. Wisconsin Invasive Species Council (WISC), Madison, WI.
- Perkins, D., C. Hedman, G. LaLiberte, E. Wollenburg, and M. Werner. (14 November 2012). A multi-agency approach to measuring the public health burden of harmful algal blooms. Society of Environmental Toxicology and Chemistry North America Annual Meeting, Long Beach, CA. Poster presentation.
- Pracheil, B. M., P. McIntyre, and J. Lyons. (19-23 August 2012). Movements of shovelnose sturgeon throughout life history inferred from otolith microchemistry. Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.

Research Presentations

- Rypel, A. L., J. Lyons, M. Mitro. (November 2012). Applied fish ecology research. WDNR and UWM SFS meet and greet, Milwaukee, WI.
- Rypel, A. L., J. Lyons, M. Mitro. (October 2012). Update on research ideas and goals. Fisheries Management Board annual meeting, Madison, WI.
- Sass, G., S. Carpenter, J. Gaeta, J. Kitchell, and T. Ahrenstorff. (7-9 November 2012). Fish population dynamics in a northern Wisconsin lake following a whole-lake addition of coarse woody habitat. North American Lake Management Society meeting, Madison, WI.
- Sass, G. G., T. D. Van Middlesworth, N. N. Michaels, B. A. Ray, T. W. Spier, J. Lyons, J. D. Stafford, and R. V. Smith. (10 October 2012). Is there a native recipe for controlling invasive common carp. Seminar at South Dakota State University, Brookings, SD. Invited talk.
- Sass, G. (8-10 February 2012). Invited presentation at the Southern Division AFS meeting, Nashville, Tennessee.
- Sharma, S., M. J. Vander Zanden, J. J. Magnuson, and J. Lyons. (19-23 August 2012). Comparing climate change and species invasions as drivers of coldwater fish population extirpations. Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- Stewart, J., S. Westenbroek, M. Mitro, J. Lyons, and L. Kammel. (19-23 August 2012). Effects of future climate projections on stream temperatures and fish thermal habitat for Upper Midwest and Great Lakes streams. Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- Stuck, J. G., L. Frankland, G. G. Sass, D. H. Wahl, and R. E. Colombo. (19-23 August 2012). Demographic differences of silver carp, *Hypophthalmichthys molitrix*, populations between impacted and unimpacted Midwestern river ecosystems. 142nd Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- Van Middlesworth, T. D., G. G. Sass, T. W. Spier, and B. A. Ray. (19-23 August 2012). Relative abundance and feeding habits of bowfin, spotted gar, and largemouth bass at the Emiquon Preserve and Reelfoot Lake: can native fish species control invasive common carp? 142nd Annual Meeting of the American Fisheries Society, St. Paul, Minnesota.
- Van Middlesworth, T. D., G. G. Sass, T. W. Spier, and B. A. Ray. (March 2012). Relative abundance and feeding habits of bowfin, spotted gar, and largemouth bass at the Emiquon Preserve and Reelfoot Lake: can native fish species control invasive common carp? Prairie Lightning Mini-Symposium, Urbana, Illinois.
- Van Middlesworth, T. D., N. N. Michaels, and G. G. Sass. (March 2012). The Nature Conservancy's Emiquon Preserve: fish community monitoring, 2007-2011. 5th Annual Emiquon Science Symposium, Lewistown, Illinois.
- Wagner, K. I. (28 November 2012). Aquatic invasive plant availability in Wisconsin. WI DNR Lake Technical Review Team, Spooner, WI. Invited talk.
- Wagner, K., A. Mikulyuk, S. Van Egeren and J. Hauxwell. (29 October 2012). Availability of aquatic invasives through the live plant trade and landscape risk. The Upper Midwest Invasive Species Conference (UMISC), LaCrosse, WI.
- Watras, C. (June 2012). Low-power wireless sensor networks for monitoring lakes and watersheds. North American Lake Management Society meeting, Madison, WI.
- Weberg, M. A., J. R. Copeland, B. R. Murphy, and A. L. Rypel. (August 2012). Movement of grass carp in an Appalachian Reservoir system. 142nd Annual Meeting of the American Fisheries Society, Saint Paul, MN.

Scientist and Technician Index

Scientist and Technician Index

Scientists in the Fisheries and Aquatic Sciences Research Section are experts in their fields of study. In the following section, we provide information on their educational background, their area of expertise, and key collaborators. In this section, we include all staff who contributed toward our mission during FY13 and 14, including those no longer represented in our current organizational chart.

Jessica Backus, LTE Technician



Education:
B.S., Zoology and Biological Aspects of Conservation, University of Wisconsin - Madison

Expertise:
Fisheries and limnology

Environmental Protection Agency National lake, shoreline and wetland assessment, zebra mussel and spiny water flea assessment

Jacob Dickmann, LTE Technician



Education:
B.S., Biology, University of Wisconsin-Oshkosh

Expertise:
Mussel community assessment

Christopher Bailey, LTE Technician



Expertise:
Field operations, fisheries monitoring, ageing, creel

Matt Diebel, Scientist



Education:
B.A. Biology, Colorado College
M.S. Water Resources Management, University of Wisconsin-Madison
Ph.D. Limnology, University of Wisconsin-Madison

Expertise:
Non-point source pollution, landscape-scale patterns in aquatic ecosystems, distributions of Wisconsin stream fishes, aquatic ecosystem connectivity, statistical modelling, Nitrogen stable isotopes

Martha Barton, LTE Scientist



Education:
B.S. Biology, University of Central Florida
M.S. Biology, University of Central Florida

Expertise:
Aquatic ecology, aquatic macrophyte monitoring, aquatic invasive plant ecology and management

Key collaborators:

DNR Water Quality Bureau; DNR Fisheries Management Bureau; US Geological Survey; UW-Madison Center for Limnology; USDA Forest Service

Caitlin Carlson, LTE Scientist



Education:
B.S., Biology, University of Wisconsin - Milwaukee

Expertise:

Scientist and Technician Index

David Dreikosen, Technician



Education:
B.S. Zoology, University of Wisconsin-Madison

Expertise:
Sampling gear, ageing techniques, ecology and fish population dynamics

Andrew East, LTE Technician



Education:
B.S., Fisheries, Northland College

Expertise:
Fisheries and avian ecology

Eric Erdmann, LTE Scientist



Education:
B.S., Wildlife Ecology, University of Wisconsin-Madison
Graduate Certificate, Geographic Information Systems (GIS), University of Wisconsin-Madison
M.S., Wildlife Ecology, University of Wisconsin-Madison

Expertise:
Ecology, Remote Sensing, GIS, Landscape Ecology

Paul Frater, LTE Scientist



Education:
BSc., Biology and Natural Resources Management, Writing Minor, University of Wisconsin-Stevens Point
MSc., Ecology and Evolutionary Biology, Iowa State University

Expertise:

Aquatic ecology, vegetation monitoring, aquatic invasive plant ecology

Paul Garrison, Scientist



Education:
B.S., Biology, Montana State University
M.S., Biology, Montana State University

Expertise:
Paleolimnology, lake restoration, lake assessment, wetland assessment, stream assessment, lake classification

Key collaborators:
USGS; Bad River Band of the Lake Superior Tribe of Chippewa Indians; Lac Courte Oreilles Band of the Lake Superior Tribe of Chippewa Indians; UW-Milwaukee—The Water Institute; UW-Stevens Point, Dr. Samantha Kaplan; Michigan State University, Dr. Patricia Sorrano, WDNR Office of Great Lakes, Lakes Program, Water Quality Bureau, Whitefish Lake Conservation Organization; Big Round Lake District; Lake Arbutus Lake Association; Silver Lake Lake Association; Barron County Land and Water Conservation; City of Shell Lake. Benton County, Minnesota Conservation Department. Clear Lake, Iowa Lake Improvement Association.

Jeremiah Gorne, LTE Technician



Education:
B.S., Northland College, Natural Resources

Expertise:
Aquatic ecology, community ecology, lake assessment

Eric Grazia, LTE Technician



Education:
B.S., Geography, University of Wisconsin - Madison

Scientist and Technician Index

Expertise:
GIS, stream passage research

Steven Greb, Scientist



Education:
B.S., Chemistry and
Watershed Management,
University of Wisconsin-Stevens Point
M.S., Forest Hydrology, Utah State University

Expertise:
Limnology and hydrology, agricultural and urban
runoff and pollutants, pathogens, acid rain
chemistry, satellite remote sensing of complex
waters

Key collaborators:
US Geological Survey; US Environmental
Protection Agency; University of Wisconsin-
Madison, Stevens Point, and Milwaukee; NASA;
UW-Extension

Daniela Gurlin, Project Scientist



Education:
B.S., Biology, University of
Rostock
MSc., Geographical information sciences,
University of Edinburgh
PhD., Natural Resource Sciences, University of
Nebraska - Lincoln

Expertise:
GIS sciences, remote sensing for ecological
research

Rabi Gyawali, Project Scientist



Education:
B.S., Civil Engineering,
Siddaganga Institute of
Technology, Bangalore
University
M.S., Human and Natural Resource Studies,
Kathmandu University
M.S., Environmental Engineering, Michigan
Technological University

PhD., Environmental Engineering, Michigan
Technological University

Expertise:
Climate effects on stream hydrology

Elizabeth Haber, LTE Scientist



Education:
B.S., Plant Biology,
University of Michigan
M.S., Ecology and Evolutionary Biology,
University of Michigan

Expertise:
Aquatic invasive plant ecology, Aquatic plant
communities

Justin Haglund, LTE Technician



Education:
B.S. Biology, University of
Wisconsin – Platteville
M.S. Natural Resources - Fisheries – University
of Wisconsin – Stevens Point

Expertise:
Fisheries and habitat monitoring, field
operations, fish age and growth analysis

Gretchen Hansen, Scientist



Education:
B.S., Biology, University of
Wisconsin-Madison
M.S., Fisheries and Wildlife, Certificate in
Ecology, Evolutionary Biology, and Behavior
Michigan State University
PhD., Limnology and Marine Science, University
of Wisconsin-Madison

Expertise:
Aquatic food webs, species interactions, fish
population dynamics (especially bass and
walleye), fisheries management, statistical
modeling, simulation modeling, aquatic invasive
species

Scientist and Technician Index

Key collaborators:

WDNR Fisheries Management, Minnesota DNR Fisheries Management, UW-Madison, UW-Steven's Point, United States Geological Survey, Michigan State University

**Jennifer Hauxwell,
Scientist and Chief**



Education:

B.S., Biology, University of Michigan
Michigan Secondary Teaching Certification in Biology and Chemistry, University of Michigan
Ph.D., Biology/Aquatic Ecology, Boston University Marine Program, Woods Hole, MA

Expertise:

Aquatic ecology, vegetation monitoring, aquatic invasive plant population dynamics and management

Key collaborators:

DNR Lakes program, DNR Water Quality Bureau, DNR Fisheries Management Bureau, DNR Bureau of Endangered Resources, Susan Knight, Kelly Wagner, Alison Mikulyuk, Michelle Nault, Martha Barton, UW-Stevens Point Fisheries Unit Coop, UW-Madison Center for Limnology

**Katherine Jardine, LTE
Technician**



Expertise:

Field operations, fisheries monitoring, ageing, creel

Martin Jennings, Scientist



Education:

B.S., Microbiology, University of Illinois at Urbana-Champaign
Ph.D., Biology, University of Illinois at Urbana-Champaign

Expertise:

Fish Ecology and life history, community ecology, conservation genetics, lakes assessment

Key collaborators:

Wisconsin Cooperative Fisheries Research Unit (B. Sloss, Justin VanDeHey, R. Frankowiak, E. Murphy, L. Westbrook); WDNR Fisheries Management (G. Hatzenbeler), WDNR Fisheries Research (J. Kampa, J. Lyons, J. Hauxwell); Minnesota DNR (P. Jacobson); Minnesota Cooperative Fish and Wildlife Research Unit (B. Vondracek, J. Keville, J. Lepore); Illinois DNR (D. Wahl, C. Wagner, D. Philipp), OMNR (C. Wilson)

**Shelby Kail, LTE
Technician**



Education:

B.A., Biological Aspects of Conservation, Geoscience, and Environmental Studies, University of Wisconsin - Madison

Expertise:

Field operations, fisheries monitoring, ageing, creel

Jeff Kampa, Scientist



Education:

B.S., Biology and Fisheries Management, University of Wisconsin at Stevens Point
M.S., Fisheries, University of Missouri

Expertise:

Fish population dynamics, fish propagation, life history of percids, centrarchids, and esocids

Key collaborators:

WDNR Science Services: Martin Jennings, Gene Hatzenbeler, Jen Hauxwell, John Lyons; WNDNR Fish Management: Al Kaas, staff at Governor Thompson, Oehmke, and Wild Rose hatcheries, Jamison Wendel, Scott Toshner, Kent Bass; UW-Stevens Point Wisconsin Cooperative Fisheries Research Unit: Brian

Scientist and Technician Index

Sloss, Justin VanDeHey; National Park Service:
Branda Thwaits; MNDNR: John Frank.

Paul Kanehl, Technician

Education:

B.S., Fish Management and
Biology, University of
Wisconsin at Stevens
Point

M.S., Biology, Tennessee Technological
University



Expertise:

Fisheries and habitat monitoring, field operations

Gary Kubenik, Technician (Retired)

Expertise:

Field operations, fisheries
monitoring



Susan Knight, UW-Trout Lake Contract Research Scientist

Education:

B.A., 1977 Dartmouth College

M.S., 1986 University of Wisconsin-Madison

Ph.D., 1988 University of Wisconsin-Madison



Expertise:

Aquatic Plants, Aquatic Ecology, Bog Ecology

Avery Koblings, LTE Technician

Expertise:

Field operations, fisheries
monitoring, ageing, creel



Gina LaLiberte, LTE Scientist

Education:

B.S., Biology, University of
Michigan

M.S., Resource Ecology
Science, University of
Michigan

Expertise:

Algal ecology and taxonomy, aquatic ecology,
paleolimnology, bioassessment of aquatic
systems



Richard Lathrop, Scientist

Education:

Ph.D., University of
Wisconsin-Madison
Oceanography and
Limnology, 1998

M.S., University of Michigan, Ann Arbor
Natural Resources (Aquatic Ecology), 1975

B.A., Lehigh University
Biology, 1971

Expertise:

Lake eutrophication and algae blooms
(especially Madison lakes), lake restoration and
management, climate change impacts in
Wisconsin



Matt Lorenzoni, LTE Technician

Expertise:

Field operations, fisheries
monitoring, ageing, creel



Luke Lorenzoni, LTE Technician

Expertise:

Field operations, fisheries
monitoring, ageing, creel



Scientist and Technician Index

John Lyons, Team Leader



Education:

B.S., Biology, Union College, Schenectady, NY
M.S., Zoology, University of Wisconsin-Madison
Ph.D., Zoology, University of Wisconsin-Madison

Expertise:

Ecology, distribution, identification, life history, and management of all Wisconsin fishes, especially smallmouth bass, walleye, exotic, threatened and endangered, and non-game species. Watershed and riparian land-use effects on streams and lakes. Bioassessment and biotic indices (i.e., IBI). Stream and river fish sampling and monitoring. Landscape-scale modeling and classification of fish habitat in streams and rivers. Climate change impacts on fishes.

Key collaborators:

WDNR Fisheries Management, Water Quality and Natural Heritage Conservation programs, U.S. Geological Survey, UW-Stevens Point, UW-Madison Center for Limnology, UW-Madison Zoological Museum, Michigan State University, Michigan DNR, Illinois DNR, Minnesota DNR, U.S. Fish and Wildlife Service, U. S. Environmental Protection Agency, Alliant Energy Corporation, Wisconsin River Alliance, Friends of the Lower Wisconsin River, Wisconsin Lutheran College, Waukesha County Land Trust, The Nature Conservancy, Wisconsin Initiative on Climate Change Impacts

Cory McDonald, Scientist



Education:

B.S., Civil Engineering, Michigan State University
M.S., Environmental Engineering, Michigan Technological University
Ph.D., Environmental Engineering, Michigan Technological University

Expertise:

Limnology, biogeochemistry, eutrophication, nonpoint source pollution, aquatic

biogeochemistry, environmental modeling, paleolimnology

Key collaborators:

WDNR Water Quality Bureau, Wisconsin Geological and Natural History Survey, Public Health Madison and Dane County, UW Center for Limnology, U.S. Geological Survey

Diane Menuz, LTE Scientist



Education:

B.S., Ecology and Evolutionary Biology, University of California, Santa Cruz
M.S., Ecology, Utah State University

Expertise:

Botany, invasive plant ecology, rare plant inventory and monitoring, plant community monitoring, species distribution modeling, GIS

Alison Mikulyuk, LTE Scientist



Education:

B.A., Biology, Grinnell College

Expertise:

Aquatic ecology, aquatic macrophyte species distribution and abundance, aquatic invasive plant ecology and management

Matthew G. Mitro, Scientist



Education:

B.A., Biology, Colgate University
M.S., Wildlife and Fisheries Biology, University of Vermont
M.S., Statistics, Montana State University
Ph.D., Fish and Wildlife Biology, Montana State University

Expertise:

Trout ecology, population modeling, mark-recapture, fish ageing, stream fish and habitat

Scientist and Technician Index

sampling and monitoring, climate change impacts on fish and adaptation strategies, statistics

Key collaborators:

WDNR Fisheries Research, WDNR Fisheries Management, WDNR Water Quality, U.S. Geological Survey, UW-Stevens Point, UW-Stevens Point Cooperative Fisheries Research Unit, UW-Madison, Wisconsin Initiative on Climate Change Impacts, and Trout Unlimited.

**Ken Morrison, LTE
Scientist**



Education:
B.S., Botany, University of Wisconsin

Expertise:
Limnology, Biogeochemistry, Airshed-Watershed Interactions, Aquatic Ecology, Plankton Biology

**Michelle Nault, LTE
Scientist**



Education:
B.S. Biology, Zoology, & Biological Aspects of Conservation, with a certificate (minor) in Environmental Studies at the University of Wisconsin-Madison

Expertise:
Aquatic ecology, aquatic macrophyte monitoring, aquatic invasive plant ecology and management

**Aaron Nolan, LTE
Technician**



Education:
B.S., 2006. Biology, University of Wisconsin-Stevens Point

Expertise:
Fisheries and habitat monitoring, field operations

**Christopher Noll, LTE
Technician**



Education:
B.S. Soil Science, UW-Madison
Environmental Studies Certificate, UW-Madison
GIS Certificate, UW-Madison

Expertise:
GIS, database development, water clarity research

**Austin Noring, LTE
Technician**



Expertise:
Field operations, fisheries monitoring, fish aging

Dan Oele, LTE Scientist



Education:
B.A., Environmental Studies, The University of Michigan
M.S. Limnology and Marine Science, University of Wisconsin – Madison

Expertise:
Invasive aquatic plant research, lake assessment and ecological impairment

Tim Parks, Scientist



Education:
B.S. Fisheries and Water Resources, University of Wisconsin-Stevens Point
M.S., Fisheries Biology, Iowa State University

Expertise:
Fisheries research projects – muskellunge, cisco, sturgeon, propagation-related support items, and warmwater rivers and streams.

Scientist and Technician Index

April Patterson, LTE Technician

Education:
B.S., Biology, University of Wisconsin - Superior



Expertise:
Native mussel population research, mussel identification, density, biomass, age and size structure along with habitat variables associated with mussels

Randal Piette, Technician

Education:
B.S., University of Wisconsin, Stevens Point
M.S., University of Wisconsin, Stevens Point



Expertise:
Warmwater rivers and streams, flathead catfish, freshwater mussels

Aaron Reusch, LTE Scientist

Education:
B.S. University of Wisconsin - Madison, Department of Geography
M.S. University of Washington, College of the Environment



Expertise:
Modeling landscape, climate, and connectivity impacts to fish communities of Wisconsin

Jeff Rubsam, LTE Technician

Expertise:
Water quality monitoring, rain sampling, trace metal clean sampling, aqueous mercury analysis, wireless wetland monitoring



Andrew Rypel, Scientist

Education:
B.A., Environmental Science, University of Alabama
M.S., Fisheries and Allied Aquacultures, Auburn University
Ph.D., Freshwater Studies, University of Alabama



Expertise:
Inland lakes research, global change on fish and mussel populations, habitat fragmentation, invasive species, natural resource management

Greg Sass, Team Leader

Education:
B.S. University of South Florida
M.S. University of Wisconsin-Madison
Ph.D. University of Wisconsin-Madison



Expertise:
My research interests within the field of aquatic ecology have primary emphasis on fish ecology, ichthyology, and fisheries biology. Specific interests involve predator-prey interactions, bioenergetics, population dynamics, and ecosystem-based fisheries management. Ongoing research focuses on long-term resource monitoring of the large rivers of Illinois, invasive species ecology and management, and floodplain lake restoration ecology. In addition, I study the response of fish communities and food webs to whole-lake manipulations of coarse woody habitat in several northern Wisconsin lakes, the ecosystem effects of a whole-lake removal of an exotic fish and crayfish, and exotic sea lamprey and lake trout interactions and food web dynamics in Lake Superior. Current research is aimed at better understanding walleye exploitation in northern Wisconsin lakes and the influences of invasive species and global climate change on aquatic ecosystems in Wisconsin.

Key collaborators:

Scientist and Technician Index

DNR Fisheries Research, DNR Fisheries Management, UW-Madison Center for Limnology, UW-Stevens Point, UW-Stevens Point Fisheries Cooperative Unit, University of Minnesota-Duluth, Michigan State University, University of Illinois, Western Illinois University, Eastern Illinois University, University of Tennessee at Martin, University of Florida, Humboldt University at Berlin, University of British Columbia, University of Washington, USGS, U.S. Army Corps of Engineers, University of Notre Dame, Great Lakes Indian Fish and Wildlife Commission

Matt Schlapper, LTE Technician

Education:
B.S., University of Wisconsin, Superior, Ecology and
Minor in Geographic Information Systems



Expertise:
Aquatic ecology, community ecology, lake assessment

Brinton Schwerbel, LTE Technician

Expertise:
National Lakes Assessment



Ann Small, LTE Technician

Expertise:
Field operations, fishing monitoring, creel, data analysis



Margaret Snyder, LTE Technician

Expertise:
Field operations, fisheries monitoring, creel surveys



Kari Soltau, LTE Technician

Expertise:
Aquatic macrophyte surveys and aquatic plant identification



Ryan Toman, LTE Technician

Education:
B.A., University of Wisconsin - Madison

Expertise:
Fisheries Management and Limnology



Kelly Wagner, LTE Scientist

Education:
B.S. Biological Aspects of Conservation, with a certificate (minor) in Environmental Studies at the University of Wisconsin-Madison

Expertise:
Aquatic ecology, aquatic invasive plant ecology, aquatic macrophyte species distribution and abundance, aquatic plant management



Daniel Walchak, LTE Technician

Education:
B.S., Wildlife Ecology: Research & Management, University of Wisconsin-Stevens Point
M.S., Natural Resources, University of Wisconsin-Stevens Point

Expertise:
Fisheries and habitat monitoring, field operations



Scientist and Technician Index

Carl Watras, Scientist

Education:

B.A., Biology, Williams College, Williamstown, MA
M.S., Zoology/Limnology, University of New Hampshire

Ph.D., Zoology/Limnology, University Of New Hampshire
Post-Doc, Environmental Engineering, MIT



Expertise:

Limnology, Biogeochemistry, Airshed-Watershed Interactions, Aquatic Ecology, Plankton Biology

Key Collaborators:

Center for Limnology, UW-Madison; Department of Electrical and Computer Engineering, UW-Madison; Department of Mathematics, UW-Madison; Department of Chemical Ecology, University of Lund, Sweden; Hubbard Brook Experimental Forest, New Hampshire; Massachusetts Institute of Technology

David Winston, LTE Scientist

Education:

B.A., Geography and Geographic Information Systems, University of Wisconsin-Milwaukee



Expertise:

LiDAR-derived Digital Elevation Models and aerial photography to digitize road/stream crossings across Wisconsin

Brian Zalay, LTE Technician

Education:

B.S., Integrative Biology, University of Illinois at Urbana-Champaign



Expertise:

Fisheries technician and aquatic invasive species research



**Bureau of Science Services
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921**

PUB-SS-1139 2014



The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of Interior, Washington, D.C. 20240.

This publication can be made available in alternative format (large print, Braille, audio tape, etc.) upon request. Please call (608) 266-0531 for more information.