GREAT LAKES NEWS FROM
MICHIGAN SEA GRANT COLLEGE PROGRAM

upwellings

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Protecting Water Quality through Proactive Environmental Stewardship

Sea Grant
Michigan

upwellings

An upwelling occurs in a lake or ocean when strong, steady winds push warm in-shore surface water away from shore causing colder, nutrient-rich water to rise.

Upwellings is published quarterly by the Michigan Sea Grant College Program. Michigan Sea Grant, a cooperative program of the University of Michigan and Michigan State University, supports understanding and stewardship of the Great Lakes through research, outreach and education.

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The Land-Water Connection

In the realm of human health, the best treatment for many ailments is often the most difficult to implement—a lifestyle change. The same could be said for the Great Lakes. What we do on land, our lifestyle, directly affects the lakes.

Like it or not, our collective actions have over time created some pretty serious problems. Beach closings reached a record high last summer, toxic chemicals still contaminate 41 "Areas of Concern," and invasive species introductions, unbalanced coastal land use, and urban and agricultural runoff continue to degrade coastal habitat and water quality. These issues must be approached on a number of fronts.

Federal, state, and local governments play a fundamental role. In 2004, the U.S. Commission on Ocean Policy released a three-year assessment on the state of the nation's coastal resources (available online at www.oceancommission.gov). To address critical Great Lakes issues, the report urges federal, state, and local government agencies to address key issues including aging sewage, wastewater and water treatment systems; urban, residential, and agricultural runoff; the impacts of antibiotics, hormones, and other pharmaceuticals showing up in streams, lakes, and fish; and "biological pollution" resulting from the continuing introduction of invasive species.

Regional collaboration is imperative to fully address these issues. The President established the Great Lakes regional collaboration in 2004 to gather consensus around actions to restore the Great Lakes. Coordination, collaboration, and consensus building are essential for tackling issues as large and complex as restoring the ecological and economic integrity of the Great Lakes and its basin. We now look forward to a draft restoration plan in July, with the final document expected in December.

As we work toward common goals, sustainable solutions must be developed from dialog among all stakeholders, including government, business, academic, and the public. This issue of *upwellings* highlights three proactive environmental stewardship programs that partner state agencies with academic institutions and business and industry. In Michigan, where all watersheds lead to the Great Lakes, these proactive programs are forging ahead—making the kind of lifestyle changes we all need to make—to protect and restore the ecological integrity of the Great Lakes and ensure the long-term economic sustainability of the human and ecological communities that depend on them.

Donald Scavia
Michigan Sea Grant Director

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Rip Current Forecasts Begin

Communities along Lake Michigan and Lake Superior will have advance warning this summer if weather conditions create an increased risk of rip currents.

The National Weather Service will issue rip current forecasts for Lake Michigan and parts of Lake Superior as part of the service's Hazardous Weather Outlook broadcast on weather radio.

"Essentially the forecast gives people a heads up…" says Dave Guenther of the National Weather Service in Marquette. "A lot will depend on local communities to take the action needed to warn swimmers." Some beaches have a flag system in place, with a red flag signaling unsafe waters.

According to Guenther, the conditions that create an increased risk of rip currents include onshore winds and waves averaging four feet or greater. These conditions allow water to build up near shore. The excess water eventually flows lakeward through a narrow channel or break in a sand bar, creating a powerful current that can easily tire a strong swimmer.

BRENNER

The conditions that create an increased risk of rip currents include onshore winds and waves averaging four feet or greater.

Rip currents have been associated with a number of drowning fatalities in the Great Lakes from 2000-2004.

NOAA has designated the week of June 5, 2005 as National Rip Current Awareness week. See: www.ripcurrents.noaa.gov

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If caught in a rip current:

- Stay calm.
- Don't fight the current.
- Swim in a direction following the shoreline (parallel).
- Float or tread water. When the current weakens, swim at an angle (away from the current) toward shore.
- If you cannot reach shore, draw attention to yourself. Call or wave for help.

Source: *Break the Grip of the Rip*

Draft Restoration Plan Expected in July

More than 125 members of the Great Lakes Regional Collaboration met in Traverse City in April to continue work on a coordinated strategy to restore and protect the Great Lakes.

The collaboration's eight issue area strategy teams address the following topics:

- Habitat/species
- Indicators and information
- Persistent bioacculumative toxics reduction
- Invasive species
- Sustainable development
- Coastal health
- Non-point source
- Areas of Concern restoration/sediments

The teams are responsible for drafting strategic action plans supported by specific action items and recommendations. The draft strategic plan for Great Lakes restoration and protection is scheduled to be released for public comment on July 7, 2005 in Duluth, Minnesota.

The Great Lakes Regional Collaboration was officially launched in Chicago on December 3, 2004, when members of the President's Cabinet, the Great Lakes Governors, the Great Lakes Congressional delegation, Mayors, and Tribal leaders met and forged an intergovernmental partnership and officially voiced their support for a coordinated strategy to further protect and restore the Great Lakes.

See: www.epa.gov/greatlakes/collaboration

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BRENNER

Protecting Water Quality through Proactive Environmental Stewardship

By Joyce Daniels

Boating is big business in Michigan, with more than 1 million registered boats on file.

The success of the industry is closely tied to a healthy environment, and boaters and marinas both play a role.

"Michigan's boating industry depends on clean water," says Michigan Sea Grant extension educator Chuck Pistis, adding that marinas have an important economic stake. "By protecting the environment they protect their businesses."

A growing number of marina owners acknowledge this connection and have voluntarily taken steps to protect water quality by participating in the Michigan Clean Marina Program.

The Clean Marina Program is one of a series of voluntary efforts to reduce pollutants and enhance natural resources. Michigan's golf industry and extensive network of state parks are also doing their part. Through proactive stewardship programs, participants are evaluating and improving a variety of business practices to protect Michigan waterways and the Great Lakes.

Michigan Clean Marina Program

Marina owner Mike Briskey is quick to point out that 90 percent of his boating customers are also fishermen. When walleye season opens, they flood Briskey's Lake Erie marina, the Luna Pier Harbour Club. Come June, "this place is a zoo," says Briskey, with more than 100 boats going in and out daily.

As a business owner, Briskey does his best to accommodate his boating and fishing clientele. He prepares the re-fueling equipment, readies the boat launch, and stocks the store. And this year he's doing something else: Briskey is one of more than 30 marina owners who are helping to protect Great Lakes water quality.

"We earn our livelihood from the public's enjoyment of the natural resource," says Briskey. "We have a vested interest in protecting the environment."

The changes are part of the Michigan Clean Marina Program, a voluntary program to reduce pollutants associated with recreational boating, maintenance and storage.

Program coordinators visited several marinas in April in preparation for upcoming site visits—the last step in the clean marina certification process. The two-day event included stops at MacRay and Belle Maer marinas on Lake St. Clair, and the Luna Pier Harbour Club on Lake Erie.

Pete Hall of Virginia Sea Grant, who conducts site visits in his home state, led the informal reviews, making recommendations to improve environmental

Through proactive stewardship programs, participants are evaluating and improving a variety of business practices to protect Michigan waterways and the Great Lakes.

MARSEE

Pete Hall of Virginia Sea Grant reviews the Michigan Clean Marina checklist with marina owner Mike Briskey. Accompanying them were Van Snider of the Michigan Boating Industries Association, Jeff Spencer of the Michigan Department of Environmental Quality, Gary Comer and Dave Kelch of Ohio Sea Grant, and Michigan Sea Grant's Chuck Pistis.

KEITH SYVINSKI

The Grand Hotel Golf Club on Mackinac Island is one of more than 225 golf courses that participate in the Michigan Turfgrass Environmental Stewardship Program.

safety. A host of marina processes underwent scrutiny, among them re-fueling stations, painting processes, pump-out facilities, storage tanks, fish cleaning areas, and solid waste removal.

Following the visit, Briskey says he has already begun "shopping for vacuum sanders" (to reduce toxic paint dust) and checking into recycling opportunities.

The changes help protect water quality, enhance fish habitat, and benefit marinas by reducing costs.

The Michigan Clean Marina Program is supported by Michigan Sea Grant, Michigan Boating Industries Association (MBIA), and the Michigan Department of Environmental Quality (MDEQ).

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See: www.miseagrant.umich.edu/cmp

Michigan Turfgrass Environmental Stewardship Program

With an estimated 900 golf courses, Michigan has the highest number of courses per capita in the nation. While some courses are located in Michigan's coastal zone, others are located on rivers, streams and water bodies that drain into the Great Lakes.

Today, more than 225 courses have voluntarily taken steps to enhance the environment and protect water quality as part of the Michigan Turfgrass Environmental Stewardship Program.

The successful program is unique in the nation, says program manager Debbie Swartz, by partnering state agencies with the golf industry and Michigan State University. All recognize the value of being proactive, voluntarily evaluating entire properties.

"Historically, well-maintained courses had to look like Augusta—trimmed down to the water. We're looking to change that mindset."

"Golf course maintenance practices have changed dramatically over the last 20 years," says Swartz. "The amount of science that goes into turf grass management today is remarkable."

Research has progressed, explains Swartz, and equipment and products have improved. Among other things, these advancements allow golf course superintendents to select fertilizers based on soil analyses, and limit certain pesticide applications to spot treatments. These practices can cut down on cost and maintenance and reduce inputs to the environment.

Some golf course superintendents have also created buffer strips along waterways where taller grasses are used to trap sediment and filter nutrients.

"Historically, well-maintained courses had to look like Augusta—trimmed down to the water," Swartz explains. "We're looking to change that mindset."

While buffer strips protect surface water, a big emphasis of the turfgrass program is on protecting groundwater. Here, many of the best management practices address the inner workings of a golf course—things like fuel storage, wellhead protection, and pesticide storage and application.

In addition to protecting water quality, the program works with courses to comply with environmental laws and regulations, reduce waste, and enhance fish and wildlife habitat and native vegetation.

This year, says Swartz, the turfgrass industry will be reviewing best management guidelines for irrigation to assist in more effectively managing water resources.

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DANIELS

An estimated 25 million people visit Michigan's 97 state parks each year.

Michigan State Parks

Michigan state parks are doing their part to lessen impact on the environment and protect water quality.

Approximately 60 state parks are taking part in a new pilot program initiated by the Michigan Department of Natural Resources (DNR), Parks and Recreation Division, in partnership with the DEQ. The program explores environmentally friendly management practices and products for use at state parks, recreation areas and water access sites.

Participating parks will be testing and promoting environmentally friendly "green" cleaning products, says the DNR's Colleen Steinman, because "we want to ensure that as few chemicals as possible end up in the watershed." Metering devices on product dispensers will help staff consistently use the proper amount of disinfectant and other substances.

Mowing restrictions will be implemented in state parks, recreation areas and boating access sites to reduce the frequency and amount of grass mowed to protect water quality. By allowing shorelines to remain grassy, the vegetation serves as a filter and helps control erosion, says Steinman. The practice also discourages geese from becoming a nuisance.

Some parks will also be using biodiesel (soy-based) fuel in maintenance vehicles as a way to burn less fuel and reduce pollution.

Park visitors can help too. An estimated 25 million people visit Michigan's 97 state parks each year, bringing all sorts of things with them—including carpet and household appliances.

"Some of our parks have picked up and disposed of 30 refrigerators in a season," says Steinman. "We're looking at whatever we can do to recycle this material."

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See: www.michigan.gov/dnr

New Report: Residual Ballast Poses NIS Threat

On average, about 90 percent of saltwater ships entering the Great Lakes are considered NOBOBs, or ships loaded with cargo that carry no declarable ballast-on-board.

These ships do contain residual ballast and sediment, however, that can get mixed with Great Lakes water and eventually discharged—along with everything in it. According to a report released in May, this discharge of mixed ballast water can lead to the potential introduction of nonindigenous species (NIS) to the Great Lakes.

The 285-page report presents the results of a three-year, multifaceted study to systematically characterize the living organisms (biota) contained in residual ballast water and sediment and the associated risk of invasion. The study was led by Thomas Johengen, of the University of Michigan, Cooperative Institute for Limnology and Ecosystem Research, and David Reid of NOAA's Great Lakes Environmental Research Laboratory.

The team surveyed 103 NOBOB vessels about their ballast management practices. They boarded 42 of those vessels to sample residual water and sediment in 82 ballast tanks.

The following are among the key findings:

About 40 percent of the 103 vessels surveyed for ballast management practices and history entered the Great Lakes with freshwater residual ballast. Such ships, according to the report, present the most serious threat of inoculation of new organisms into the Great Lakes ecosystem.

The presence of one or more microbial pathogens was detected in 26 of the 42 ships sampled. However, the research method determined only presence, not absolute concentrations, so the study cannot definitively assign a human health risk.

A diverse assemblage of phytoplankton and invertebrate biota was found in the residual ballast water and sediments sampled, including several nonindigenous species not reported for the Great Lakes.

The study concludes that the process of "ballast water exchange is an imperfect, but generally beneficial management practice in the absence of more effective and consistent treatment options."

The study was funded by the Great Lakes Protection Fund, NOAA, the U.S. EPA, and the U.S. Coast Guard.

To read the full report, see: www.glerl.noaa.gov/nobob/

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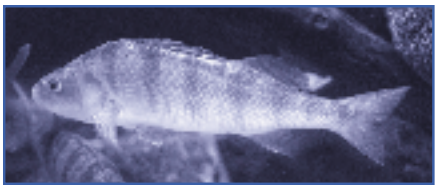
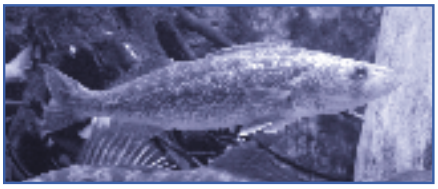
BRENNER





Favorable spring spawning conditions have contributed to increased natural reproduction of yellow perch and walleye in Saginaw Bay.

Workshops Address Status of Lake Huron Fishery

Sport anglers, charter captains and resource managers were among nearly 400 people who met throughout April to discuss the status and future of Lake Huron's fishery.

Stakeholders shared information during a series of workshops conducted by Michigan Sea Grant in cooperation with the Michigan State University Extension, the Michigan Department of Natural Resources (DNR), and various fishery stakeholder groups. The workshops provided an opportunity for in-depth analysis of some of the major fisheries and food web concerns in Lake Huron.

"The Lake Huron fishery has undergone marked changes in recent years," said Dave Borgeson, Northern Lake Huron unit supervisor for the DNR's Fisheries Division. "The invasion of exotic aquatic species and the near absence of the Chinook salmon's preferred prey, the alewife, have greatly altered the lake's food web. These workshops and meetings give all stakeholders a chance to sit down and discuss these changes and the future of the lake's fishery."

Alewife Decline Affects Chinook

According to DNR data, Chinook salmon have been naturally reproducing in increasing numbers in Lake Huron, with fish of wild origin now greatly outnumbering Chinook of hatchery origin. Some Chinook caught, however, are reported to be in poor condition, likely the result of lack of food.

"The invasion of exotic aquatic species and the near absence of the Chinook salmon's preferred prey, the alewife, have greatly altered the lake's food web."

Alewife, the primary food for Chinook, have significantly declined, according to data from researchers at the USGS Great Lakes Science Center. This rapid decline in alewife has been attributed primarily to over-predation by salmon, as well as poor survival of young alewife during consecutive cold winters.

Additionally, the aquatic organism *diporeia*, at the base of the food web, continues to decline in Lake Huron, according to the NOAA Great Lakes Environmental Research Laboratory, likely due to competitive interactions with invasive zebra mussels and quagga mussels.

Conditions Favorable for Some Native Species

In contrast, favorable spring spawning climate conditions and the near absence of alewife have contributed to increased natural reproduction of yellow perch and walleye in Saginaw Bay. Lake trout have also exhibited small steps toward rehabilitation in Lake Huron, with a few naturally produced young lake trout being sampled throughout the Lake for the first time in more than 20 years.

"It's important that stakeholders are aware of these fishery changes that are occurring in Lake Huron and have an opportunity to engage in discussion about these changes with researchers and managers," says Michigan Sea Grant extension educator Brandon Schroeder, who facilitated the workshops.

The workshops were held in Bad Axe, Oscoda, Port Huron, Alpena and Cheboygan. Results will be provided to the DNR Fisheries Division, Lake Huron Citizens' Advisory Committee and other partners.

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See: www.miseagrant.umich.edu/fisheries

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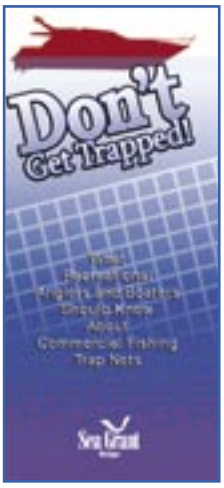
Safety on the Lakes



Boaters: Don't Get Trapped

Provides practical information for recreational boaters on how to recognize and avoid commercial fishing nets anchored in the Great Lakes. Includes safety tips and full color illustrations to help identify nets and markers.

Swimmers: Break the Grip of the Rip

Highlights the dangers of rip currents, how to recognize them, and what to do if caught in a rip current.

Great Lakes Most Unwanted

Specially designed for young audiences, this new classroom poster series presents key facts about aquatic invasive species in the Great Lakes. Colorful illustrations, photos and graphics help 4th-8th grade students understand why invasive species are a problem and what can be done.

Aquatic Invasive Species Awareness Week

Governor Jennifer Granholm has proclaimed June 4-12, 2005 as Aquatic Invasive Species Awareness Week in Michigan to encourage people to find ways to prevent the spread and introduction of aquatic invasive species in our waters.

For more information, see: www.michigan.gov/deq

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