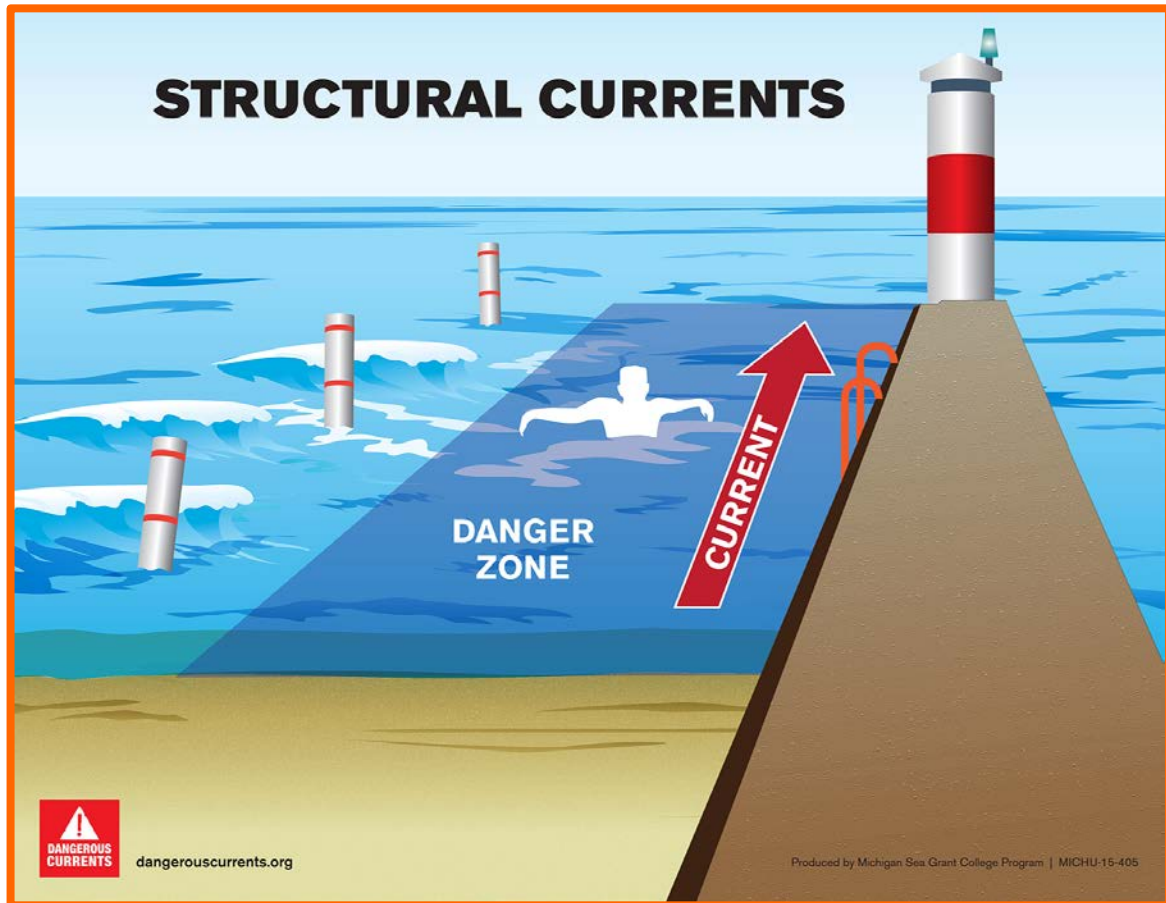


Water Safety Recommendations

*Supporting the Designated Beach Policy Update with
Improved Dangerous Current Messaging*

Michigan Coastal Zone Management Program, Project Number: 14-RIP-003
Regents of the University of Michigan



Elizabeth LaPorte¹, Ron Kinnunen² and Stephanie Ariganello²

Michigan Sea Grant College Program²
The University of Michigan (U-M) and Michigan State University
U-M Graham Sustainability Institute¹



GRAHAM
SUSTAINABILITY INSTITUTE
UNIVERSITY OF MICHIGAN



MICHU-15-707

Disclaimer

The statements, findings, conclusions and recommendations in this report are those of the authors, the University of Michigan or Michigan State University, and do not necessarily reflect the views of the Michigan Department of Environmental Quality and the National Oceanic and Atmospheric Administration.

About Water Safety Recommendations

These recommendations were developed for park staff, first responders and others to use as best practices to help reduce the loss of life due to dangerous currents, waves and related swimming hazards in the Great Lakes region. These recommendations were developed in collaboration with the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service, (NWS), the Michigan Department of Natural Resources (MDNR) and others.

“Forty-five of the parks and recreation areas managed by the Michigan Department of Natural Resources (MDNR) Recreation Division are on the Great Lakes or connecting channels, and include some of the most highly visited parks in the state system,” *From Section 309 Assessment and Five-Year Strategy for Coastal Zone Management Program Enhancement, Fiscal Years 2012-2016.*

Dangerous currents training materials are not intended to take the place of rescue training, such as life-saving certifications or other courses. Materials produced by the project team are intended to assist risk communications and public outreach efforts locally and regionally.

Public outreach efforts in Michigan included working closely with the MDNR state Safety Officer, park managers, and other staff. Efforts also involved working with partner organizations, such as the Michigan County Sheriffs, the U.S. Coast Guard, local media and various communications experts. It is clear that the collaboration between MDNR, sheriffs and the Coast Guard is critical to resolving any jurisdictional issues that may arise, as well as leveraging the resources that each organization has at its disposal (e.g., rescue and recovery efforts). Each of these organizations, as well as many others, were extremely cooperative with project efforts to increase awareness, provide consistent language, and make a variety of resources available to assist with water safety.

Partners

Michigan Sea Grant, in partnership with many experts, developed educational and outreach tools to educate people about dangerous currents and other swimming hazards in Michigan and throughout the Great Lakes region. Water safety products, including websites, publications, signs, and diagrams are the result of collaborating with the state and federal government, as well as first responders (e.g., fire and rescue personnel, county sheriffs and the U.S. Coast Guard), water safety groups, and volunteers.

Financial assistance for this project was provided, in part, by the Michigan Coastal Zone Management Program (CMZP), Office of the Great Lakes (OGL), Department of Environmental Quality (DEQ), under the National Coastal Zone Management Program, through a grant from the NOAA, U.S. Department of Commerce. The State of Michigan is part of a collaborative regional water safety effort of the Great Lakes Sea Grant Network; the Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin Coastal Management Programs; the NOAA-NWS and Coastal Storms Program; and others.

Table of Contents

Public Outreach.....	4
Recommendations for public outreach	4
Targeted Messages and Products	6
Key Audiences and Recommended Products	6
Recommendations for Using Products and Tools	7
Training and Education.....	7
Graphics and Templates.....	7
Educational and Outreach Tools	10
Great Lakes Regional “Current Smart” Campaign.....	11
Multimedia Messages	11
Key Messages in Video and Animations	11
Social media	12
Messages for the public.....	12
Use of Emergency Rescue and Water Safety Equipment	12
Summary	13

Public Outreach

Public outreach efforts include risk communication, identifying target audiences, producing materials designed for specific audiences and making resources widely available to a variety of end users. It is clear to many stakeholders and experts, including Dr. Guy Meadows (Michigan Technological University), Dr. Ron Kinnunen (Michigan Sea Grant – Michigan State University) and Dr. Maria Lapinski, (Michigan State University) and the NOAA Coastal Storms Program that there is a need for dangerous currents outreach and communications materials tailored for Michigan and Great Lakes audiences. Our team recognizes the importance of national campaigns to raise awareness about rip currents. However, it is critical to fill gaps in existing materials, including:

- Tools to address the fact that from 2002-2014 there have been 255 incidents related to structures, typically involving young males (Great Lakes Current Incident Database), including 70 fatalities.
- Approaches to address the lack of lifeguards at public beaches — with many beaches recording more than 1.5 million visitors annually (MDNR estimated population statistics).
- Tools to depict a variety of types of dangerous currents, including diagrams, descriptions and templates for multiple applications.
- An end-user-focused approach to developing products targeting three audiences: young men, parents with children and educators/leaders/trainers.

Developing clear and consistent language for a variety of applications, required many iterations and careful consideration of how multiple audiences may respond to specific messages.

Our team relied on a variety of resources, including: Eastern Research Group, *Great Lakes Beach Hazards* (2014), and more recently the Lapinski report, *Great Lakes Swim Safety Risk Communication for 18-24 year-old Males*, (2014) Michigan State University, 13-RIP-001. These reports, as well as ongoing discussions with state experts from state agencies, stakeholder groups and others, guided the development of risk communication messages for this document, and the entire project, *Supporting the Designated Beach Policy Update with Improved Dangerous Current Messaging* (14-RIP-003 project).

Recommendations for public outreach

Launch a statewide water safety communications campaign, leveraging the products and tools from the MDEQ-Office of Great Lakes-Coastal Management Program “Supporting the Designated Beach Policy Update with Improved Dangerous Current Messaging” (14-RIP-003) and the “Implementing the Michigan Department of Environmental Quality Coastal Management Program’s Section 309 Strategy (13-RIP-001) projects, as well as the “Implementing Dangerous Currents Best Practices in the Great Lakes” (NOAA Coastal Storms) project.

Recommendations to enhance MDNR water safety efforts:

- Launching a Water Watcher Program at 10 coastal MDNR Parks in 2015 and expand in following years.
- Partnering with the U.S. Coast Guard, leveraging the existing Kids Don't Float life jacket awareness program.
- Ask safety patrol officers to demonstrate the proper use of life jackets
- Highlight the MDNR life jacket loaner program on the MDNR website, at campgrounds, park entrances, and at interpretative centers
- Distribute existing messages (e.g., Rock the Jacket), animation, video and products, including the Water Watcher cards throughout the swimming season.
- Implementing a Pier Safety Program at all MDNR Parks with Structures (piers or breakwalls)
 - Place new Structural Current beach signs near structures.
 - Place additional buoys to demark the separation from designated swim areas and danger zones, near structures.
 - Provide information about structures on the MDNR website, at campgrounds, park entrances, and at interpretative centers.
 - Distribute existing messages (e.g., Steer Clear of the Pier), animation, video and products, including the Water Safety Tip cards throughout the swimming season.
- Incorporating Water Safety Outreach and Risk Communications content into annual training programs
 - Specific recommendations are outlined below. However, one additional resource which could be applied more broadly is the "Quiet Signs of Drowning" flier. It includes a high quality 4-color diagram and key points about what to look for when identifying a swimmer in distress (diagram by Jason Lee, no date on sample publication).
- Incorporating Equipment Use and Monitoring demonstrations into annual training programs.
 - Equipment use demonstrations may include throw ring and throw bag toss. Equipment monitoring demonstrations may include what to look for regarding torn or damaged equipment and guidelines for replacement.

Targeted Messages and Products

The decision to focus on target audiences is supported by the data from the Great Lakes Dangerous Currents Database, www.dangerouscurrents.org. The NWS has been collecting data about current-related fatalities and rescues since 2002. This data has been critical to securing state and federal support to help reduce fatalities in Michigan and the Great Lakes region.

In 2011, Michigan Sea Grant stepped up efforts to work closely with the NOAA National Weather Service (NWS) to determine key audiences at risk. Those most at risk include parents with children and young men. Another audience of interest is first responders and others that may educate students, seasonal park staff and the public about key issues.

Key Audiences and Recommended Products

Adults with Children:

- Water Watcher cards
- Video news releases*
- Water safety tips rack card
- Warning signs
- Flag warning system

Young men:

- Water safety tips rack card
- Animated series highlighting campaign messages*
- Social media outreach centered around #BeCurrentSmart*
- Warning signs, and diagrams (the Structural Currents diagram and sign template)
- Warning flag system

First responders, park staff, educators, outreach experts and community leaders:

- PowerPoint training tool which includes overview and defining terms, science of great lakes currents, public outreach and education, Great Lakes current incident database and resources
- Templates: signs, diagrams, talking points, summaries about dangerous currents, see: www.dangerouscurrents.org
- Curriculum: “Dangerous Currents 101” and “Dangerous Currents: Don’t Get Swept Away”
- Online Training Tool (in development now, expected 08-15-2015): Contact Michigan Sea Grant, msgpubs@umich.edu.

* Products produced through the “Implementing Dangerous Currents Best Practices in the Great Lakes” NOAA Coastal Storms project.

Recommendations for Using Products and Tools

MDNR Park Service officials often serve as first responders, due to the absence of lifeguards at most of Michigan's coastal beaches. Many parks support beach patrol staff that monitor the behavior of beachgoers, nearshore weather conditions, and identify possible threats to swimmers. Park officials often witness risky behavior, such as pier jumping and swimming in conditions that are unsafe for even the strongest of swimmers. While additional publications, signs, and messages may not stop people from engaging in risky behavior (see quote from swimmer below), these materials may provide critical information to prepare individuals on what to do if caught in a dangerous current.

“...I think everybody knows drowning could happen. So if it's [warning flag] red and I'm [at] the beach for a while and I'm between 18 and 24, I'm male and I've had a few beers or whatever, I don't care if it's red. I'm gonna [sic] go in the water” *From Lapinski, M., Viken, G., Great Lakes Swim Safety Risk Communication for 18-24 year-old Males, 2014.*

Our public outreach goal is to provide people with relevant information to make informed decisions, before they get to the beach, and while they are at the beach. This approach is in line with NOAA's “vision of the Future,” supporting healthy ecosystems, communities and economies that are resilient in the face of change (NOAA's Next Generation Strategic Plan, 2010).

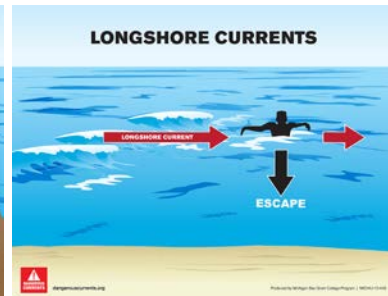
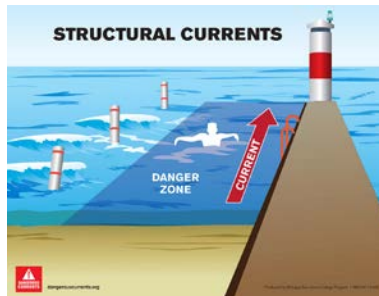
Training and Education

Annual training is important for both seasonal and regular park staff. Learning about who is at risk and the specific threats to public safety is important for park staff, emergency managers and others. Training programs provide an opportunity to discuss new products and approaches, strengthen partnerships with local officials and educate new and existing staff about policies, procedures and best practices.

Effective water safety and rescue training will address two key components: 1) Education and outreach targeted to address who is at risk and why; and 2) Hands-on demonstrations on the proper use and monitoring of emergency rescue and water safety equipment.

Graphics and Templates

MDEQ/OGL/CMP, MDNR, NOAA, National Sea Grant, and others promote the use of consistent messages to convey important information. To this end, the project team developed new materials through this project, as well as related project efforts. Graphics include the three most common dangerous currents: rip, structural and longshore currents. Each diagram highlights possible routes to safety, with the exception of the structural current diagram, as there may be few options for swimmers trapped near a structure to rescue themselves. The following graphics and their narratives are available through the dangerous current website (www.dangerouscurrents.org):



Rip currents form when waves break over a sandbar near the shoreline and the water and its momentum get trapped between sandbar and shore.

When the water and the momentum build up, the water has to go somewhere. One of the ways the pressure is relieved is when water returns to sea in the form of a rip current, a narrow but powerful stream of water and sand moving (ripping) swiftly away from shore. Rip currents that vary in size and speed can be found on many beaches every day.

Rip currents will not pull a swimmer under the water, but will carry them out to the open water, away from shore.

While it can be difficult to predict when and where most currents will occur, the opposite is true for structural currents. The currents found alongside or as a result of structures like piers and breakwalls — called structural currents — are usually always present.

Structural currents, when paired with others like longshore or rip currents, can move a swimmer from one dangerous current area to another with no clear path to safety.

Avoid jumping off or swimming near piers. The currents found along these structures are often dangerously strong.

As the name suggests, longshore currents move parallel to or the ‘long’ way along the shoreline. These currents will exert a force to move along shore, making it difficult to remain in front of a spot on the beach. They often happen between the first and second sandbars near the shore.

Longshore currents become more dangerous when they combine with rip currents or structural currents since they can move a swimmer swiftly down a beach and into the path of another current or into a structure (pier or breakwall), making it more difficult to swim to shore.

Be aware of longshore currents that may carry you toward structures. Stay away from any structure.

Beach Sign Templates include the diagrams of each type of current, as well as a new flag warning system template, shown below.

Stay Safe

Attention: Flag Warning System

There are dangerous currents at this beach,
and fatalities have occurred.



Red = Stop.
**Stay on the beach
and out of the water.**



Yellow = Caution.
Watch for dangerous
currents and high waves.



Green = Go.
But stay aware of
changing conditions.

- A **red** flag means that there is a high risk of drowning.
- **Swimmers:** Stay away from piers and other structures.
- Even an Olympic swimmer couldn't win a race with a dangerous current.
- Absence of flags does not assure safe waters.

www.dangerouscurrents.org



Dangerous Current awareness is part of a state and regional effort led by Michigan Sea Grant in collaboration with the NOAA-National Weather Service, the Michigan Department of Environmental Quality (MDEQ), the Michigan Department of Natural Resources and others. Sign design supported, in part, by the Michigan Coastal Management Program, Office of the Great Lakes, MDEQ, under the National Coastal Zone Management Program, through a grant from NOAA, U.S. Department of Commerce.

MSGL-03-002

The Stay Safe Flag Warning System sign template includes more direct information about the preferred behavior, based on the warning. It also includes information about structures, as well as the strength of dangerous currents.

Publication templates are consistent with the messages and graphics used in beach signs and include the Water Watcher and Water Safety cards. Both cards include information about the flag warning system. Water Watcher Card prints double-sided and are targeted towards parents. The Water Safety Tip Card also prints double-sided and is targeted towards both parents and young men.

Educational and Outreach Tools

The following two tools are available online via the Dangerous Currents website, www.dangerouscurrents.org

Dangerous Currents in the Great Lakes, electronic presentation (PPT)

Outline of Content:

1. Overview and Defining Terms
2. Science of Great Lakes Currents
3. Discussion
4. Public Outreach and Education
5. Great Lakes Current Incident Database
6. Resources

Public Outreach Publications

Parents are important in conveying key messages. “Many participants talked about their parents, most often their mothers, as a primary source of information about swimming-related risks in general, and about rip currents in particular,” Lapinski, et al. (2004).

While the project team recognizes that signs and publications alone may not be effective means of reaching everyone, the flag warning system is effective if deployed properly.

“Each participant group spontaneously mentioned warning flags at the beaches as a source of risk information. For some participants, posted flags served as a key source of real time information about water safety. It served as their way of understanding whether or not dangerous currents were likely to be present and the primary visual cue for whether or not to enter the water,” *From Lapinski, et al. (2004).*

Warning flags are posted at many public beaches indicating the presence of dangerous currents, breaking waves or other swimming hazards, based on the National Weather Service forecasts and nearshore observations. Although both the Water Watcher Card and Water Safety Tip Card highlight the color warning flag system (green, yellow and red flags), the project group recognized that not all public beaches currently use a flag warning system.

Michigan Sea Grant, MDNR, and others are distributing the Water Watcher and Water Safety Tip card publications and it is recommended that they continue to do so.

To request print copies for beach areas in Michigan, contact the Michigan Sea Grant publications office. (If making modifications to the template, please credit Michigan Sea Grant and the MDEQ-OGL-Coastal Management Program when using these materials.)

Additional materials include:

- Dangerous Currents in the Great Lakes Fact Sheet
- Presentations
- Great Lakes Current Incident Database
- Types of Currents Diagrams and summaries
- Dangerous Currents Project Report 2013-2014
- Lapinski-Viken Risk Communications Report 2014

Great Lakes Regional “Current Smart” Campaign

Multimedia Messages

In 2015, Michigan Sea Grant managed the production of two new public outreach products that may be used by MDNR, DEQ and others to help promote water safety. These products are free and available to anyone. K-12 educators, park interpreters and others are encouraged to use this material to increase awareness about swimming hazards related to dangerous currents and breaking waves. Products include:

1. High-quality video, including interviews with MDNR park staff, US Coast Guard, and County Sheriffs. This 90-second ready-to-use video was produced by Michigan Media, at the University of Michigan.
2. Animation series targeted at youth. A series of 15-20 second animations was produced by Michigan Media at the University of Michigan.

Key Messages in Video and Animations:

- *Rock the Jacket*—Parents: If you don’t have a life jacket for your child, borrow one.
- *Steer Clear of the Pier*—Youth: Stay 100 feet or more away from piers.
- *Be a Water Watcher*—Parents: Keep close watch of children at all times.
- *Three Steps to Safety*—Swimmers: If caught in a dangerous current:
 1. Stay calm
 2. Swim to the side
 3. Head for shore
- *Three things to remember*—Assisting Those In Trouble: Attempting A Rescue:
 1. Act fast
 2. Get help
 3. Throw a floatable
- *Heed Warning Flags*:
 - **Red = Stop.** Stay on the beach and out of the water. High swim risk. Conditions are life threatening to anyone entering the water.
 - **Yellow = Caution.** Watch for dangerous currents and high waves. Moderate swim risk. Conditions could be life threatening for children and inexperienced swimmers.
 - **Green = Go Carefully.** Stay aware of changing conditions.

- *Stay dry when the waves are high:*
 - High waves often bring dangerous currents – stay out of the water and on the beach.

Social media messaging

- Twitter: Various messages tagged with #currentsmart
- Facebook: Various messages tagged with #currentsmart

Messages for the public

Promote Actions to Take Before Swimmers Get to the Beach:

- NWS Great Lakes Central Forecast webpage – in production now and expected to roll out through the dangerouscurrents.org website.
- Contact someone at a public beach and ask if there are any safety warnings for swimmers posted (e.g., yellow or red flag)
- Go to [MyBeachCast](#) mobile application and check the forecast

Promote Actions To Do While Swimmers Are at the Beach:

- Monitor changing conditions – wind speed, wave height (NWS forecast and local observations).
- Some public beach areas have implemented a color flag warning system. Recently, we have made changes to the messaging to more clearly identify the specific threat and appropriate actions to take, based on the threat level:
 - **Red = Stop.** Stay on the beach and out of the water. High swim risk. Conditions are life threatening to anyone entering the water.
 - **Yellow = Caution.** Watch for dangerous currents and high waves. Moderate swim risk. Conditions could be life threatening for children and inexperienced swimmers.
 - **Green = Go.** Stay aware of changing conditions.
- More remote beach areas may not have the resources to maintain a flag warning system. In this case, a good practice is to recommend people use a NOAA weather radio at the beach.
- Cell coverage may not be possible in some beach areas, making connections to forecasting messages and apps online impossible to receive via cell phones.

Use of Emergency Rescue and Water Safety Equipment

Promote the following actions to successfully rescue someone in danger:

- Respond quickly. Ask someone else to call 911 and find a park official.
- Look for a ring buoy. Hold onto the end of the rope and throw the ring to the swimmer in trouble. Pull the swimmer to safety. If you need help, continue holding the rope, and call for help.
- If a life ring is not available, throw anything that floats, like a cooler.

- If you need to go into the water, bring something that floats with you (e.g., life ring, life jacket, rescue tube, etc.) to avoid becoming a victim yourself.
- Distill and promote best practices for tossing a ring buoy — considering waves, wind and currents, demonstrated by MDNR staff from Holland State Park.

Summary

These recommendations, along with specific comments made in the text of the draft Beach Policy document, may be used to inform a guidelines document. Perhaps the guidelines document is the best option for identifying specific applications for developing new outreach materials in a format that is in alignment with current MDNR educational efforts and templates.

Regardless, the important point is that water safety education and outreach materials are used and disseminated widely by MDNR. Consistent and persistent use of water safety messages, diagrams, signs and publications will assist in efforts to raise awareness, spark discussion and help prevent the loss of life.