

Abstract

An average of 11 people die each year due to dangerous currents in the Great Lakes. To help eliminate drownings in the Great Lakes, multiple efforts to improve beach safety, inform beach users, and promote responsible beach use are underway. This talk will describe several efforts in 2015 and 2016 that were funded by NOAA's Coastal Storms Program including:

- The Great Lakes Water Safety Consortium
- The deployment of rescue stations on Great Lakes beaches, and
- New beach observation and modeling tools

The Great Lakes Water Safety Consortium helped develop beach signage and new outreach products for beachgoers and hosted two conferences by bringing together first responders, community leaders, park rangers, research scientists, lifeguards, meteorologists, survivors, loved ones, and other water safety advocates. Because the Great Lakes Beach Association and the Water Safety Consortium are working to keep beachgoers safe, this talk will address and encourage identifying potential opportunities for collaboration between these organizations.



Improving Safety From Dangerous Currents, and Opportunities to Work Together

Jesse Schomberg and Marie Thoms – MN Sea Grant

Guy Meadows – Michigan Tech Research Institute

Chin Wu – University of Wisconsin Madison

Rhett Register – Michigan Sea Grant

Jamie Racklyeft – Great Lakes Water Safety Consortium

Todd Breiby – Wisconsin Coastal Management Program



Coastal Storms Program Goals

- Prevent loss of life and property
- Lessen economic impacts on communities and business
- Sustain the natural environment

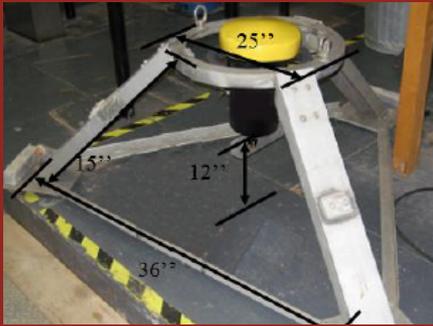


SuperiorWatersheds.org



Philip Schwarz Photography

Topics Today



- Monitoring and Measuring Dangerous Currents
 - Guy Meadows, Michigan Tech Research Inst.
 - Chin Wu, UW Madison
- Implementing Dangerous Currents Best Practices
 - Rhett Register & Kate Bailey, MI Sea Grant
- Creation of the Great Lakes Water Safety Consortium
 - Jamie Racklyeft, Director



Dangerous Currents Field Research, Mapping Resources and Data Collection & Management

Guy Meadows

Robbins Professor of Sustainable Marine Engineering

and Amanda Grimm

...and many others at

Great Lakes Research Center (GLRC)

Michigan Tech Research Institute (MTRI)

and University of Michigan



Michael vs. Drifters



Michael Phelps:
Career Best 100 m Freestyle

-47.51 s à 2.1 m/s

4.7 mph

6.9 fps (~ 1 body length/second)

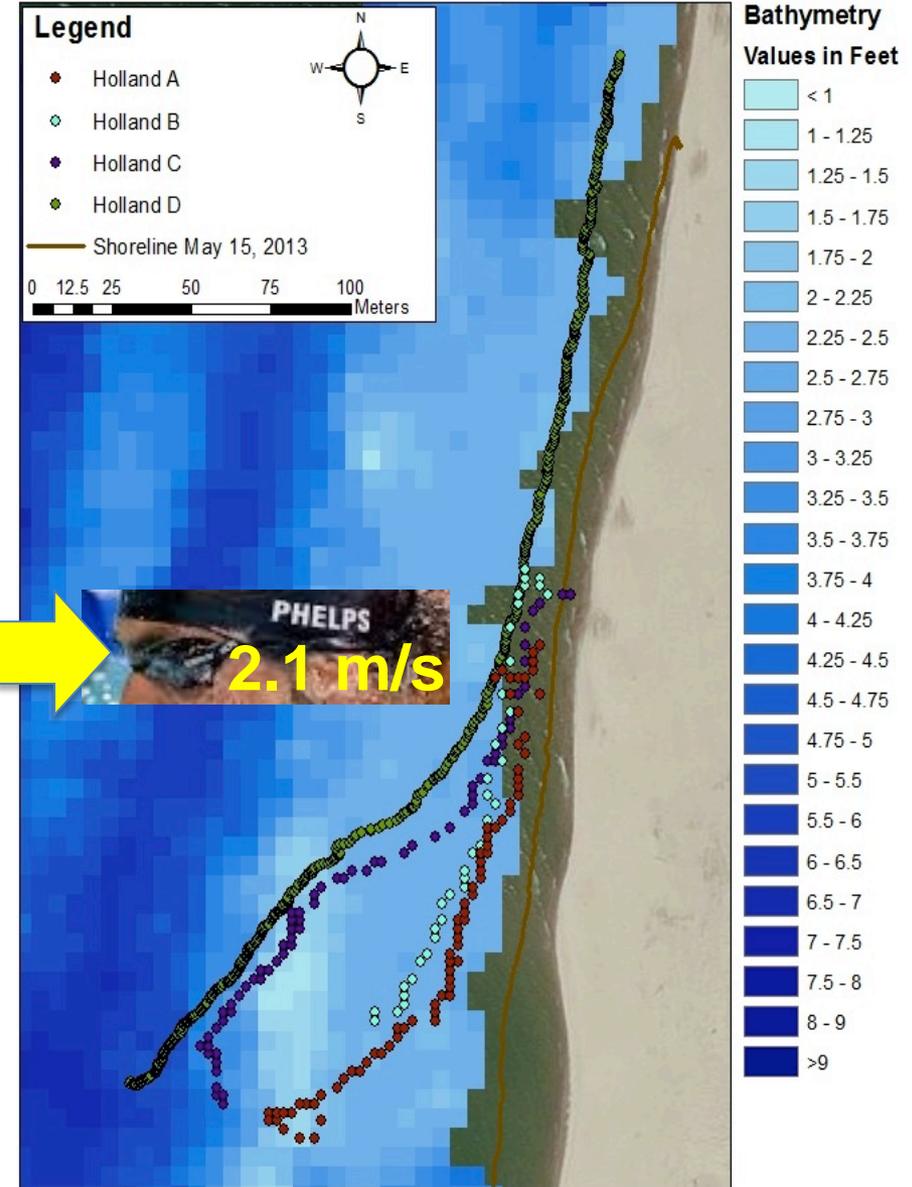


Holland State Park – Drifter Floats

- no bathymetric features indicating rip current activity
- drifters travelled consistently along the shoreline.

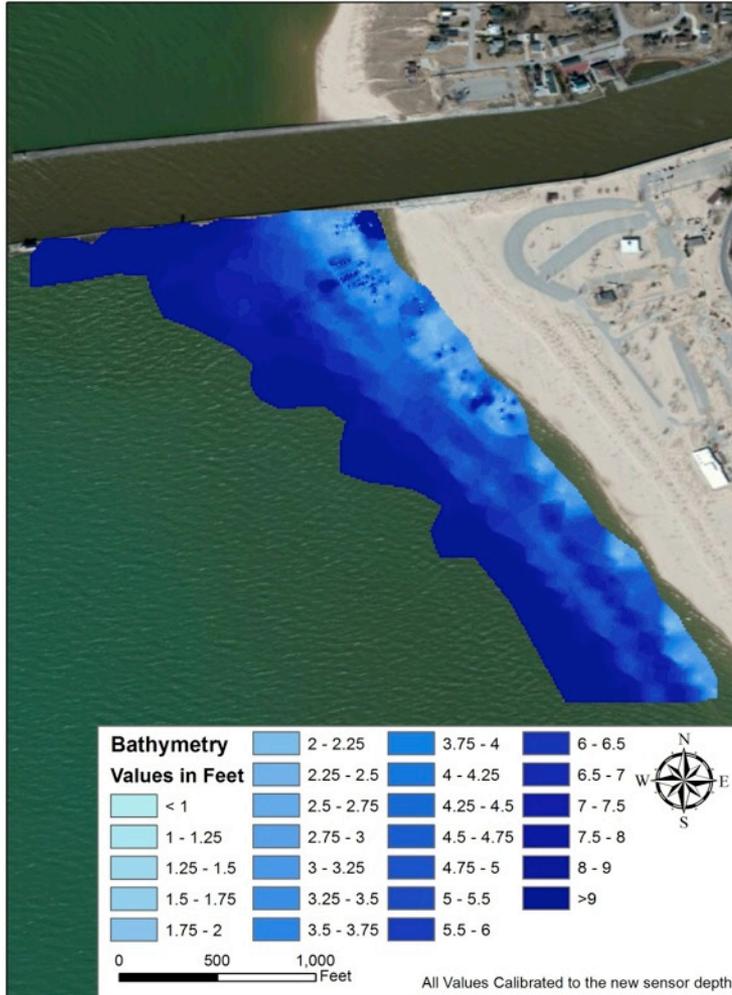
Site	Holland A	Holland B	Holland C	Holland D
Average Velocity (m/s)	0.45	0.50	0.20	0.30
Maximum Velocity (m/s)	1.71	3.00	2.00	1.41
Distance From Shore: Start (m)	53.64	29.94	64.22	86.00
Distance From Shore: End (m)	3.21	3.51	0.00	16.31
Travel Time (min)	8.25	7.22	15.65	21.47

Holland State Park May 14th, 2013

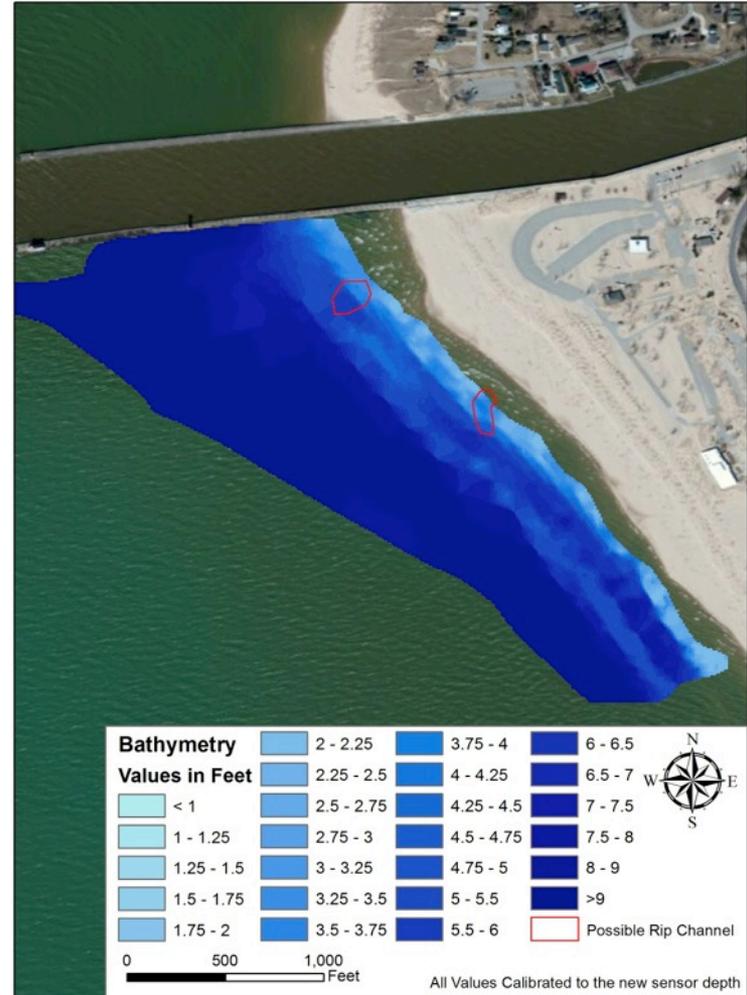


Pre and Post – Storm Bathymetry Grand Haven State Park

Husky Traveler and BathyBoat Derived Bathymetry:
Grand Haven State Park May 13, 2013



Husky Traveler Derived Bathymetry:
Grand Haven State Park May 16, 2013



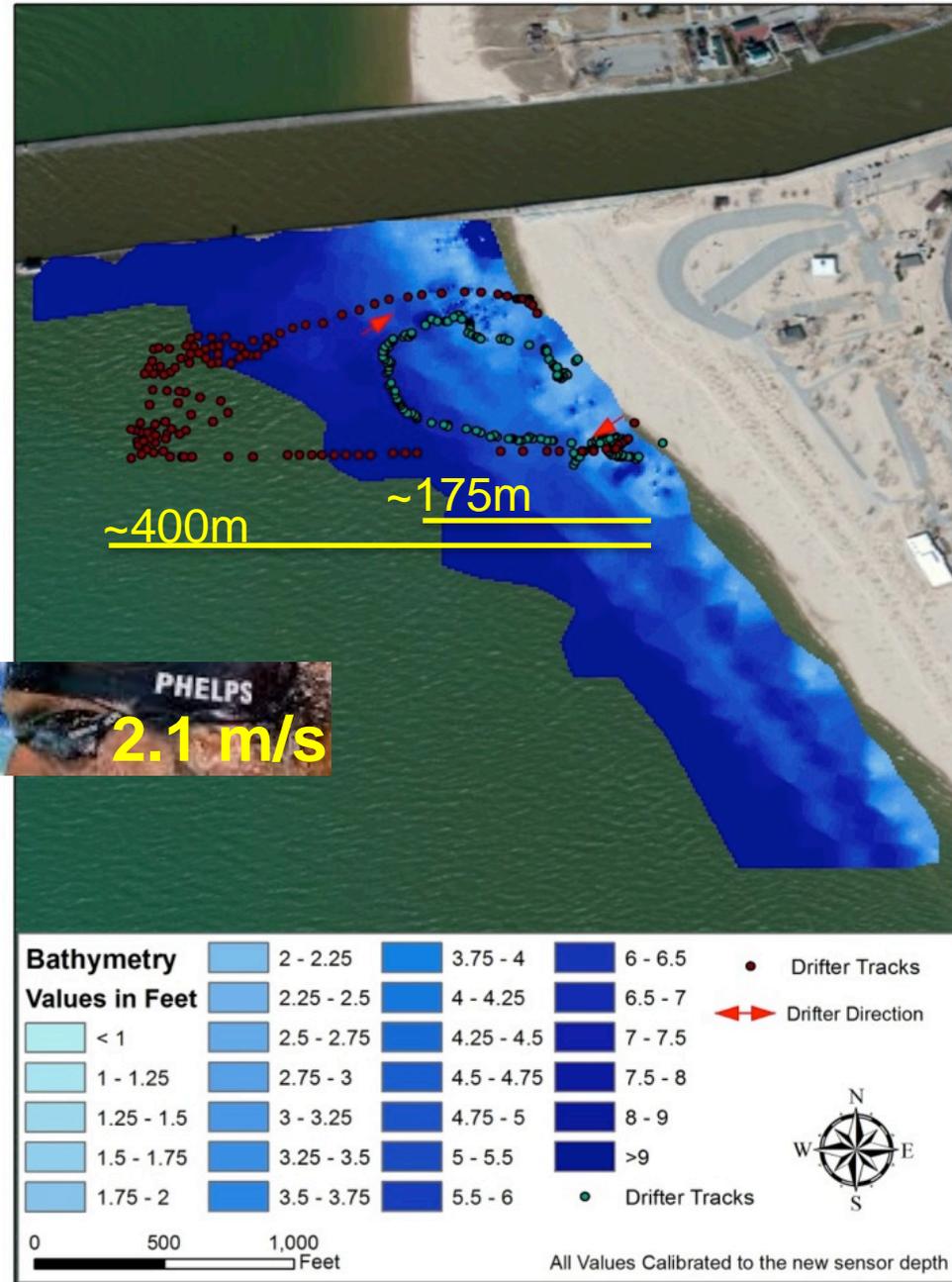
Drifter Tracks and Velocities

Grand Haven State Park beach, rip current area

- both drifters carried quickly offshore, floated slowly north and eventually pushed back towards the beach
- Average drifter velocity in the rip current was 0.3 m/s, maximum was 3.6 m/s
- drifters were carried 175 m & 400 m offshore and took approximately an hour to return to the shoreline.



Derived Bathymetry with Drifter Tracks:
Grand Haven State Park May 15, 2013



Takeaways....

- **Almost all Great Lakes sand beaches have Dangerous Nearshore Currents (DNCs)**
- **DNCs develop rapidly with increasing wave height**
- **Nearshore bottom is continually readjusting to waves and currents**
- **Rip channels can migrate down the beach (Safe à Unsafe)**
- **DNCs persist long after waves subside**



Development of an Observation, Forecasting and Warning System for Rip Currents

- **Project Lead:**

Chin Wu, University of Wisconsin-Madison

- **Geographic Scope:**

Duluth, MN;
Milwaukee, WI and
Port Washington, WI

<http://infosportwashington.cee.wisc.edu/>

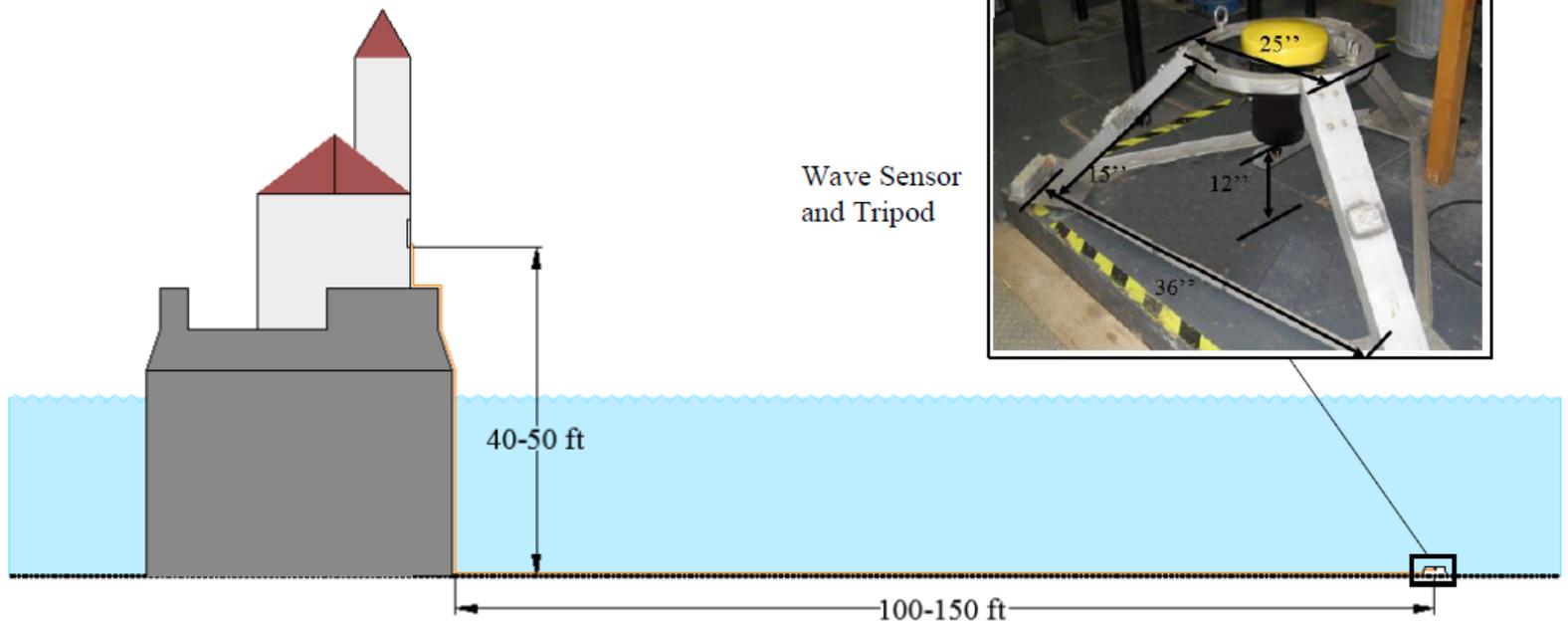


INFOS System

- Stereo-camera system
- Real-time nearshore wave heights



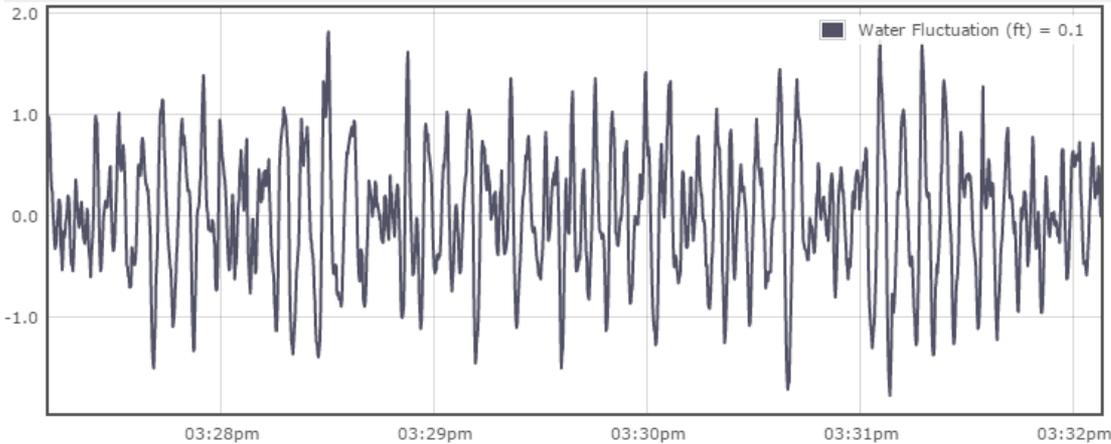
Front view



Nearshore Wave Observation

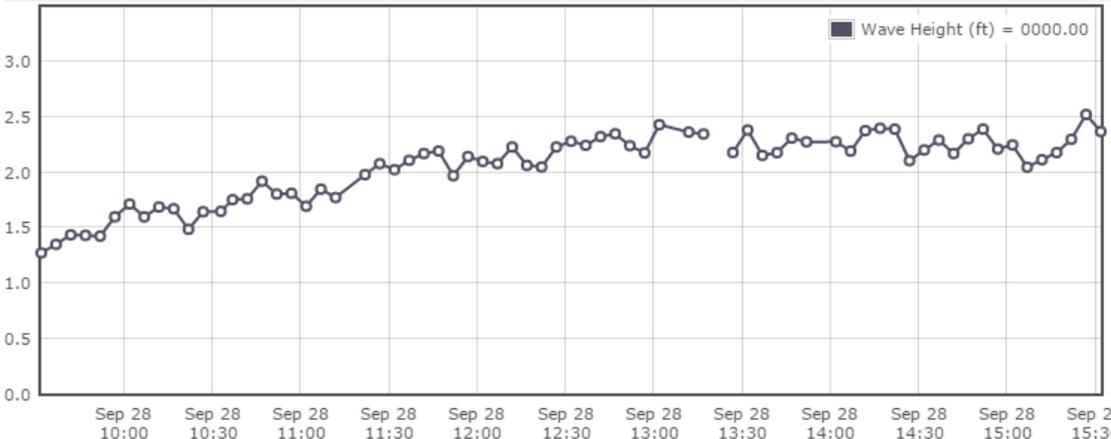
Offshore Wave

Real-time Water Fluctuation in Feet



Click Button to Change Time Series:

Wave Height in Feet



Click Button to Change Time Series:

Current Watch at Duluth, Minnesota

Wind Speed	2.2 mph	Air Pressure	30.2 in Hg	Water Temp. (surface)	62.7 °F
Wind Direction	NNE	Air Temp.	57.2 °F	Water Temp. (bottom)	54.6 °F



< 1 ft	1-2 ft	> 2 ft
Low Risk	Moderate Risk	High Risk

and/or wave conditions support dangerous rip currents. Rip currents are life-threatening to anyone entering the surf.

Implementing Dangerous Currents Best Practices

Project Lead: MI Sea Grant

Geographic Scope: IL, IN, MI, OH, MI,
WI, MN

n Regional Collaboration

n Beach Safety Equipment

n Messaging and Outreach

- #currentsmart campaign



Photo: MI Sea Grant

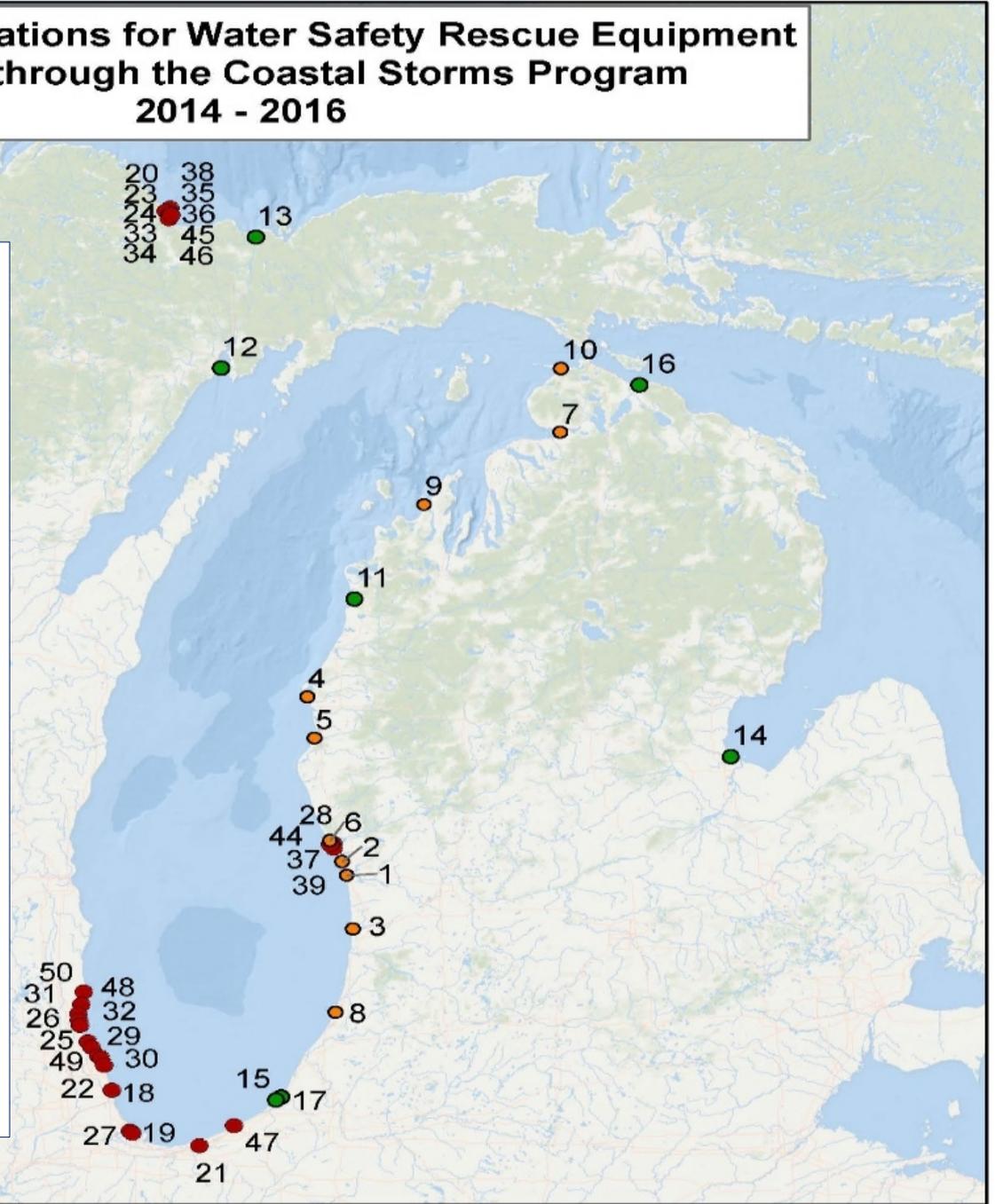
Deployment Locations for Water Safety Rescue Equipment Supported through the Coastal Storms Program 2014 - 2016



- 2014 Rescue Equipment Deployment**
1. Grand Haven State Park
 2. Hoffmaster State Park
 3. Holland State Park
 4. Ludington State Park
 5. Mears State Park
 6. Muskegon State Park
 7. Petoskey State Park
 8. Van Buren State Park
 9. Van's Beach
 10. Wilderness State Park

- 2015 Rescue Equipment Deployment**
11. Arcadia Dunes
 12. Aronson Island
 13. Au Train - Hiawatha Nat'l Forest
 14. Bay City State Park
 15. Bethany Beach
 16. Cheboygan State Park
 17. Cherry Beach

- 2016 Rescue Equipment Deployment**
- | | |
|---------------------------|---|
| 18. Chicago, IL | 36. Middle Bay |
| 19. Whihala Beach | 37. Muskegon South Pierhead Lighthouse |
| 20. Dog Beach | 38. New Picnic Rocks Location |
| 21. Dunes Learning Center | 39. Norman F. Kruse Park |
| 22. Evanston, IL | 40. Park Point 12th St/Tot Lot Beach |
| 23. Founders North | 41. Park Point Beach House |
| 24. Founders South | 42. Park Point Lafayette Community Club Beach |
| 25. Glencoe Beach | 43. Park Point South Pier Beach |
| 26. Nunn Beach | 44. Pere Marquette Park |
| 27. Hammond Marina | 45. South Beach |
| 28. Harbour Towne Beach | 46. Tourist Park |
| 29. Rosewood Beach | 47. Washington Park Beach |
| 30. Kenilworth Beach | 48. Waukegan Municipal Beach |
| 31. Sunrise Beach | 49. Wilmette, IL |
| 32. Forest Park Beach | 50. Illinois Beach State Park |
| 33. Mattson Park - East | |
| 34. Mattson Park - West | |
| 35. McCarty's Cove Beach | |



Rescue Equipment Station Examples



EMERGENCY USE ONLY

If swimmer is in distress:

- Yell or blow a whistle to call for help
- Dial 911
- Keep the victim in sight
- Use any safety equipment staying on shore if possible
- Put on a life jacket before entering the water

RESCUE BAG



RESCUE RING



www.dangerouscurrents.org



LIFE SAVING EQUIPMENT FOR EMERGENCY USE ONLY
In Memory of Travis Baska (7-28-96 to 7-28-98)

Parts by: Mackinac County Water Safety Review Team

Members of the Travis Baska Family: Mike, Debbie, Richard, Wayne & Toni
Mackinac County Sheriff Dept. Mackinac County Sheriff Dept.
Michigan State Police Michigan Dept. of Transportation
Mackinac County Office of Emergency Services Life Link
Michigan State University Extension Mackinac County 911
St. Ignace, Chamber of Commerce Michigan Dept. of Natural Resources
Lore, Mackinac, Alger, Schoolcraft Co., Health Dept. U.S. Coast Guard
Hewatha National Forest Academics of Great Camp School
Construction - 911 Equipment Provided
Donated by: U.S.D.A. Forest Service Great Lakes Life Transportation Co.

To be used by Trained Personnel Only

Water Safety Rescue Equipment and Signage

Years 2015 and 2016	Youth Life Jacket	Adult Life Jacket	Rope/ Throw Bag	Rescue Board	Rescue Can	Rescue Tube	Rescue Throw Ring	Ring Hooks	Safety Whistle
Total	375	165	477	44	34	79	279	50	566

Year	Safety Placards	English Tri-Folds	Spanish tri-Folds
2016	235	7000	1000



"Michigan Sea Grant supported the City of Evanston's [Illinois] efforts to save 26 swimmers during the 2015 beach season." – Adam Abajian, IL

"Life-ring and throw bag were instrumental in saving the life of a 30-year-old male. He jumped into Lake Michigan from the big pier in Whiting Park he became distressed and went into an active drowning phase. Had first responders not been armed with the life-ring and throw bag, we more than likely would have had a submerged recovery." – Nick Kalwinski, City of Whiting, IL

Making Waves to End Drowning

G R E A T L A K E S
WATER SAFETY
C O N S O R T I U M





LIFESAVING WATER SAFETY TIPS

The Great Lakes Water Safety Consortium's mission is to end drowning in the Great Lakes.
Here are ways you and your loved ones can be safer in the water.

AVOID DROWNING BE CURRENT SMART

- **Know Before You Go**
Check the National Weather Service for forecasts about dangerous waves and currents.
- **Stay Dry When Waves Are High**
Whitewater/waves as little as 2-3 feet high can generate dangerous currents.
- **When in Doubt, Don't Go Out**
Respect the power of the water and don't take chances.
- **Buddy Up**
Never swim alone – there's safety in numbers.
- **Steer Clear of the Pier**
Most current-related incidents occur near structures.

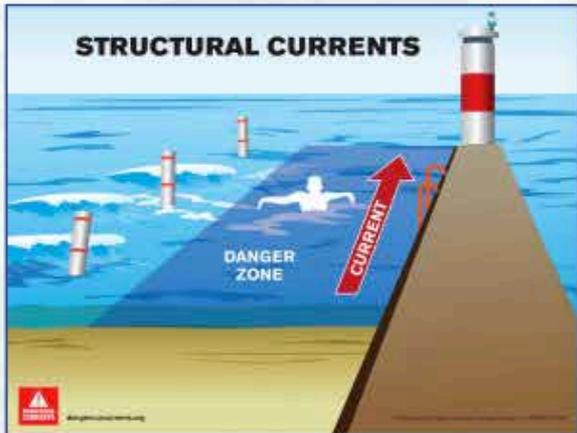


ESCAPE DROWNING BE A SURVIVOR

- **Don't Fight the Current**
Even Olympic swimmers can't overcome the power of rip currents.
- **Yell for Help**
Call for help as soon as you realize you're in trouble – the closer you get to drowning, the harder it will be to yell.

SAFELY SAVE OTHERS FROM DROWNING DON'T BECOME A VICTIM

- **Be a Water Watcher**
Designate someone to watch people in the water as their sole responsibility.
- **Drowning Doesn't Look Like Drowning**
Know the signs of drowning. It's not like Hollywood.



Great Lakes
Water Safety
Consortium
2016 Conference
GRAND HAVEN
*Making Waves
to End Drowning*



Action Committees



Determine consistent messaging and maximize media relations.



Research and recommend standard signage and safety equipment.



Set consistent training modules and advocate for standard school curriculum.



Manage scientific data and recommend Consortium success metrics.



Determine recognition and awards criteria for members and non-members.



Manage finances, including fundraising and operating expenditures.

Plus:

- Conference Planning
- Lifeguarding (NEW)



Contact GLWSC:

- Visit: GreatLakesWaterSafety.org
- Email: jracklye@glwsc.org



Tweet: [@GLWaterSafety](https://twitter.com/GLWaterSafety)

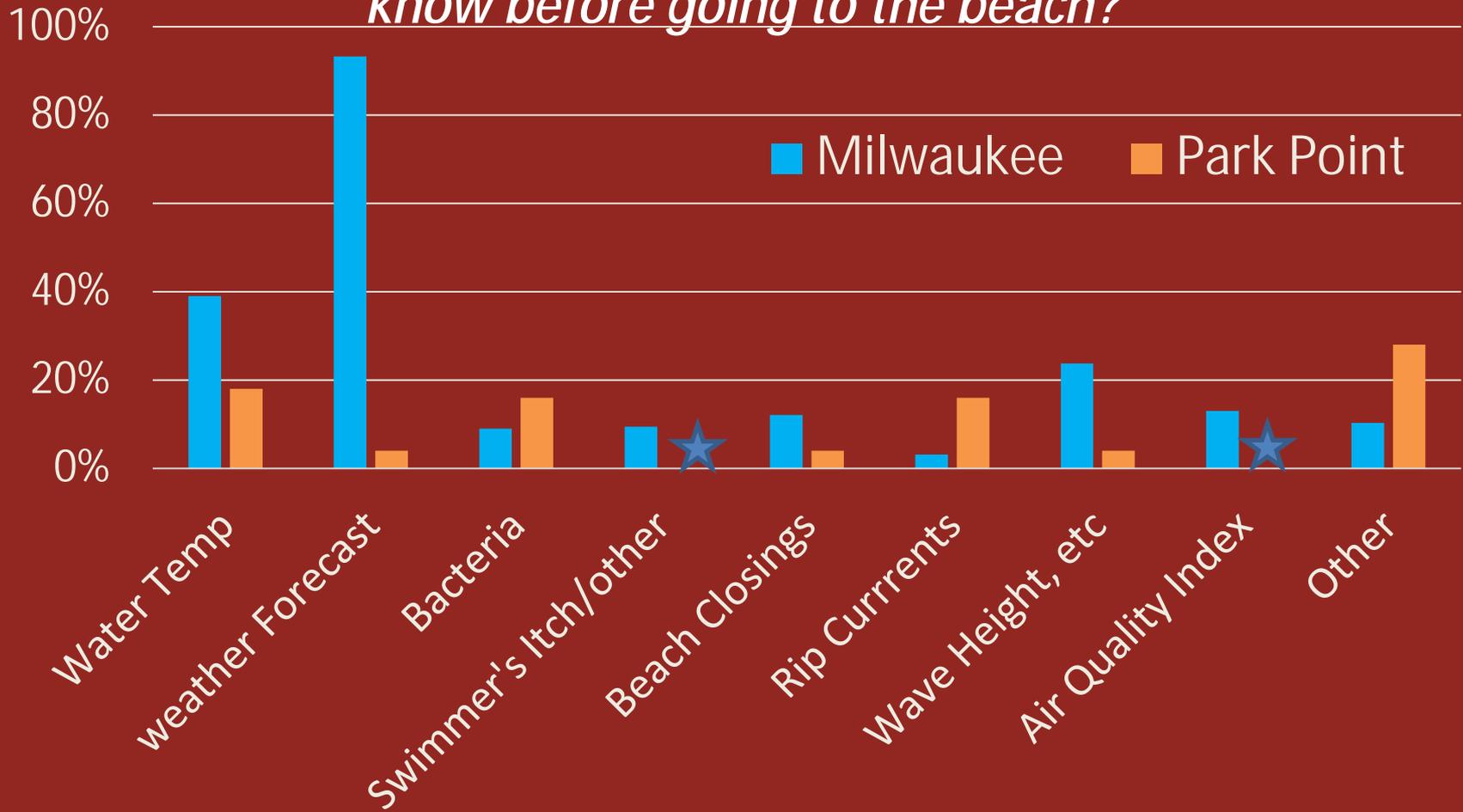


Like: [GreatLakesWaterSafetyConsortium](https://www.facebook.com/GreatLakesWaterSafetyConsortium)

- BOARD OF DIRECTORS
- President & Executive Director - Jamie Racklyeft, Rip Current Survivor
- Secretary - Megan Dodson, National Weather Service
- Treasurer - Rula Karapatsakis, University of Michigan
- Board Member - Bob Dukesherer, National Weather Service
- Board Member - Jesse Schomberg, Minnesota Sea Grant

2010-11 Milwaukee & Duluth Beach User Survey

What information about beach conditions would you like to know before going to the beach?



Jesse Schomberg and Marie Thoms,
MN Sea Grant jschombe@d.umn.edu

