



## Great Lakes Maritime Research Institute

*A University of Wisconsin - Superior and  
University of Minnesota Duluth Consortium*



# Great Lakes Maritime Transportation K-12 Education/Outreach Program

October 1, 2010 to September 22, 2011

### GOAL:

To increase awareness and knowledge of Great Lakes Maritime Transportation by K12 students and the public, and to encourage its inclusion in the K-12 curriculum and public education programs.

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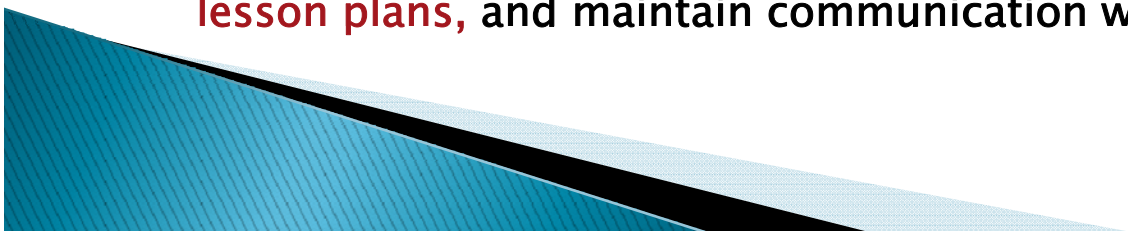
Website:

[http://wupcenter.mtu.edu/education/great\\_lakes\\_maritime/index.htm](http://wupcenter.mtu.edu/education/great_lakes_maritime/index.htm)

**MichiganTech**

Activities for Year 6 Grant Period: Oct. 1, 2010 – Sept. 2011

1. **Conduct a *Great Lakes Maritime Transportation Summer Teacher Institute*** in collaboration with the Toledo Maritime Academy and University of Wisconsin Madison in Toledo, OH in summer 2010.
2. **Conduct a *Mathematics & Navigation Summer Teacher Institute*** at Michigan Technological University in summer 2010 in collaboration with a ship captain and mathematics instructor.
3. **Conduct a teacher workshops at: Great Lakes Shipwreck Museum** at Whitefish Point Lighthouse in Upper Peninsula, at Michigan State Historical Museum in Lansing, MI, or other similar facility in a Great Lakes state.
4. **Facilitate a presentation or publication on *Great Lakes Maritime Transportation*** at/in a state or national conferences to recruit workshop and summer institute participants and disseminate teaching tools.
5. **Assemble EIGHT *Great Lakes Maritime Transportation Education* teaching chests** for dissemination to museums and education centers in the Great Lakes region.
6. **Update the *Great Lakes Maritime Transportation Education* website, post new lesson plans,** and maintain communication with past participants.



# *1. Great Lakes Maritime Transportation Summer Institute*





# Day One:

## Overview of Great Lakes Intermodal Transportation

by Carol Wolosz, Exec. Director, Great Lakes Maritime Research Institute

## Overview of Port of Green Bay

by Chuck Larscheid, Director, Brown Co. Port & Sewerage Authority

## Tour NOAA Green Bay Weather Station

by Teri Egger, meteorologist). Marine weather forecasting

Neville Public Museum guided tour of *On The Edge of the Inland Sea* exhibit  
and exhibits on transportation in Green Bay from early settlement  
to 20<sup>th</sup> century, early trade, shipbuilding.

## Benefit /Cost Analysis of Transportation Choices

by Dr. Teresa Adams, UW Madison



# Day Two:

Wisconsin Maritime Museum (Manitowoc, WI)

Wisconsin shipbuilding history, exhibits; boat-building activity, K-12 Lessons by Wendy Lutzke, maritime educator

Tour of SS *Badger* (car ferry from Ludington, MI)

Working Aboard Ship

by Rick Brown, Mariner & Instructor, Maritime Academy of Toledo

Aquatic Invasive Species & Ballast Water Management

by Susan Sylvester, WI DNR

Invasive Species Curriculum

by Wendy Lutzke, maritime educator



# Day Three:

Sturgeon Bay Coast Guard Canal Station tour  
By Wayne J. Spritka, Station Master, and “Coasties”

Shipping: Then & Now  
By Rick Brown, Maritime Academy of Toledo

Navigation Through the Ages: Methods and tools used to navigate safely from notched sticks, to the sextant, Loran, SATNAV and GPS.  
By Rick Brown, Toledo Maritime Academy

Bay Ship-building Company tour - dry dock & 1000-footer repairs

Harbor Lady cruise on Sturgeon Bay shipping canal



# Day Four

Eagle Bluff Lighthouse Tour at Peninsula St. Park:  
History of early navigation and lifesaving efforts



Coast Guard Marine Safety & Environmental Protection  
by Chris Tantillo, supervisor, U.S. Coast Guard.

Basic Navigational Concepts  
Rick Brown, mariner, Maritime Academy of Toledo

Maritime Archeology: tools and resources  
Keith Meverden & Tamara Thomsen, maritime archaeologists,  
WI St. Historical Society.



# Day Five

Great Lakes Bulk Carriers: history & engineering of “Lakers” and Tug/Barge System.  
by Joseph Fischer, President , Bay Engineering

Door County Maritime Museum John Purvis tugboat tour: showcases Sturgeon Bay,  
home to ship-building for 100 years producing fishing trawlers, Navy vessels,  
ore carriers, and yachts with Bob Desh, Museum Director.

Lake Levels & Maritime Transportation  
by Jim Lubner, Education Coordinator, Wisc. Sea Grant

Participants share lesson ideas

Course evaluation & Institute ends!





# Teacher Comments

*A wonderful class. I look forward to other classes that bring depth to our understanding of the Great Lakes.*

*Thanks for making this happen. I very much enjoyed the Institute.*

*I was just in Port Huron with my father. I'm sure he got tired of me saying, "Hey, look at that ship! At the class I just took, I learned that..."*

*I'm excited to share some of what I learned with my students.*

*I would consider attending additional sessions as this was very informative.*

*Thank you for such a great opportunity.*

*I can't wait to bring much of this information back to my school.*

*I truly appreciate all of the time that each of the presenters took to help make this class be successful.*

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# More Teacher Comments

*I want to thank all the presenters, planners, organizers, etc. This institute was planned very well!*

*Wow, what a week. My mind was spinning from all that I learned.*

*thanks for all the work going in to this class - enjoyable, entertaining, and fun*

*Wonderful event, looking forward to more!*

*Overall, a great week. I feel this experience has built up my background knowledge of the Great Lakes and provided many classroom activity ideas.*

*Well worth the time spent! Thanks for making it a wonderful week and lining up so many experts!*

*The sharing portion at the end of the week was extremely helpful.*

*The venue for the class was so good that I would recommend that you have it in Door County every year. I can't imagine that you would find a better place!!*

# Lesson Plans developed by teachers after the institute:

## ELEMENTARY

1. **Pen Pals with a Great Lakes Ship**, by Lynn Maki  
1<sup>st</sup> Grade, Social Studies and Language Arts
2. **Aquatic Invasive Species and Their Control**, by Patti Thunell  
2nd Grade, Language Arts, Social Studies and Science
3. **Let There Be Light**, by Beth Messman  
3<sup>rd</sup> & 4<sup>th</sup> Grade, Social Studies, Art & Language Arts
4. **Vanish Into Thin Air**, by Beth Messman  
3<sup>rd</sup> & 4<sup>th</sup> Grade, Social Studies and Language Arts
5. **The Rouse Simmons: The Christmas Tree Ship**, by Patti Thunell  
3<sup>rd</sup> Grade, Language Arts and Social Studies
6. **Michigan Shipping and Products**, by Sandra Carey  
3<sup>rd</sup>-4<sup>th</sup> Grade, Integrated Classroom
7. **Most Wanted!**, by Angela Adams  
5<sup>th</sup> Grade, Science and Writing
8. **The Mighty Workhorse**, by Angela Adams  
5<sup>th</sup> Grade, Writing and Social Studies



# Lesson Plans developed by teachers after the institute:

## MIDDLE SCHOOL

1. **How Low Can They Go?**, by Amy Gustafson  
7<sup>th</sup> Grade, Science and Math
2. **Predicting Future Trends in Great Lakes Shipping Using Data**  
by Laura Scribner, 7<sup>th</sup>/8<sup>th</sup> Grade, Math
3. **How Fast, How Far?**, by Dennis Simi  
8<sup>th</sup> Grade, Math
4. **Where Are We Now?**, by Dennis Simi  
8<sup>th</sup> Grade, Math

# Lesson Plans developed by teachers after the institute:

## HIGH SCHOOL

1. **The Great Lakes St. Lawrence Seaway System** by David Rowe  
8-12 Grade, Science and Social Studies
2. **Friend or Foe?**, by Amy Gustafson  
10<sup>th</sup> Grade, Biology
3. **Quagga Quandary** by Deb Del Zoppo  
10<sup>th</sup> Grade, Biology
4. **Hydrilla/Godzilla** by Deb Del Zoppo  
10<sup>th</sup> Grade, Biology
5. **Invasive Species** by Troy Averill  
9-12 Grade, Math
6. **Calculating Ballast** by Troy Averill  
9-12 Grade, Math

## *2. Mathematics & Navigation Summer Teacher Institute*





# Day One: Finding Position, DED Reckoning



# Day Two: Charts & Charting Using Navigation Instruments



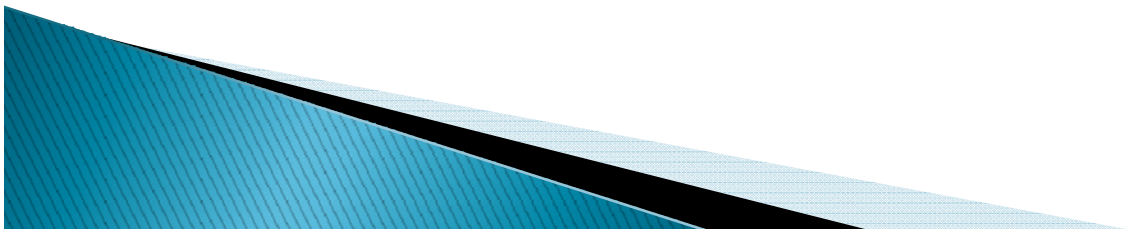


# Day Three: Compass, Speed, Time and Distance





# Day Four: Visual Aids and Electronic Instruments



# Day Five: Teachers Navigate from Keewenaw Bay to Pequamming





# Teacher Comments

*It was a great course. I enjoyed every moment of it.*

*Professor Roblee was very thorough in his explanations.  
He was an excellent teacher.*

*Good Course! Fun experience! I loved everything about it!*

*I had fun, it was great to be out on the boat and see how our in class  
work compared with the real world.*

*It was a unique experience of a lifetime. Every second of it was exciting.*

*I looked forward to every day in this 5-day institute.  
My classmates as well as the professor were phenomenal.*

*Overall the institute was a well designed curriculum support program.*





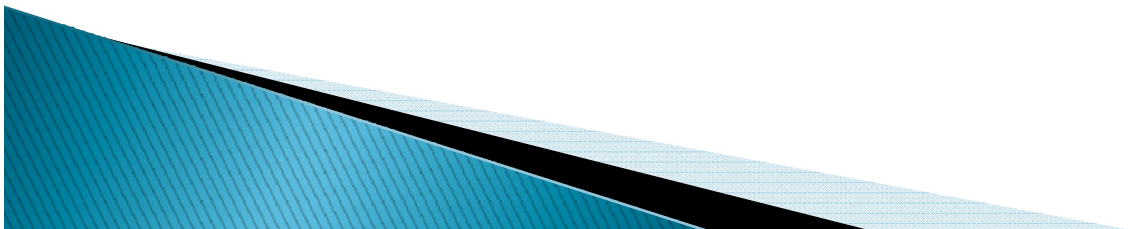
# Lesson Plans

## ELEMENTARY

1. **Marine Navigation Using a Compass Rose**, by Julie E. Junttila  
4<sup>th</sup> Grade, Social Studies and Math
2. **The Route of the Edmund Fitzgerald**, by Julie E. Junttila  
4<sup>th</sup> Grade, Social Studies and Math
3. **Learning Directions and Degrees of Movement** by Jeff Adamick  
5<sup>th</sup> Grade, Special Education Math

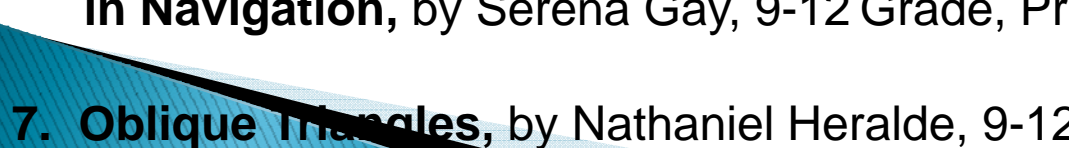
## MIDDLE SCHOOL

1. **Learning Directions and Degrees of Movement** by Jeff Adamick  
6<sup>th</sup> Grade, Special Education Math.

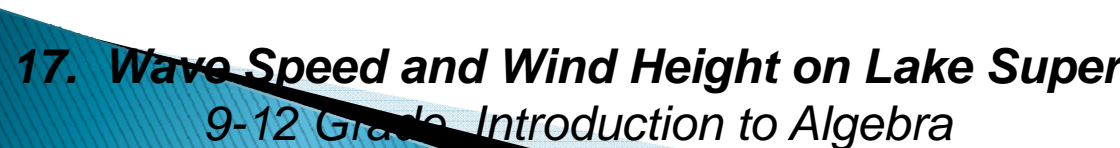


# Lesson Plans

## HIGH SCHOOL

1. **Using Vectors to Navigate (Day One)**, by Randall L. Elenbaas  
9-12 Grade, Geometry or Algebra 2
  2. **Using Vectors to Navigate (Day Two)**, by Randall L. Elenbaas  
9-12 Grade, Geometry or Algebra 2
  3. **Plotting a Course through the School**, by Randall L. Elenbaas  
11<sup>th</sup> grade Trigonometry
  4. **Finding Locations on a Chart with Polar Coordinate**, by Randall L. Elenbaas  
11<sup>th</sup> grade Trigonometry
  5. **Getting Your Fix: How to Determine One's Location Using Lines of Position**  
by Serena Gay, 9-12 Grade, Geometry
  6. **Plotting and Adjusting Your Course: Using Vectors & Trigonometry in Navigation**, by Serena Gay, 9-12 Grade, Precalculus
  7. **Oblique Triangles**, by Nathaniel Heralde, 9-12 Grade, Geometry
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# Lesson Plans

9. ***Lines of Latitude and Longitude***, by Keith Johnson, 9-12 Grade, Math
  10. ***Plotting Points in Baltimore Harbor***, by Fiel Angela Hose, 9-12 Grade, Math
  11. ***Convert Decimal Degrees into Degrees, Minutes, Seconds***  
by Fiel Angela Hose, 9-12 Grade, Math
  12. ***Vector Resolution***, by Robert Madigan, 11-12 Grade, Physics
  13. ***Dimensional Analysis***, by Robert Madigan, 11-12 Grade, Physics
  14. ***Correcting for Magnetic Variation***, by Kevin Murphy, 11-12 Grade, Physics
  15. ***Average Velocity and Speed on a Boat Trip***, by Kevin Murphy  
11-12 Grade, Physics
  16. ***Calculating Time When Travelling by Water***, by Tiffany Scullion  
9-12 Grade, Introduction to Algebra
  17. ***Wave Speed and Wind Height on Lake Superior***, by Tiffany Scullion  
9-12 Grade, Introduction to Algebra
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### 3. Teacher Workshop at Great Lakes Shipwreck Museum at Whitefish Point in Paradise, MI



# Shipwreck Museum Tour



**Great Lakes Maritime Transportation overview**

**History of Shipwrecks & U.S. Life-Saving Service on the Great Lakes**

by Fred Stonehouse, Author & Historian

**Deepwater Archaeology & Exploration**

by Tom Farnquist, Great Lakes Shipwreck Historical Society

**Tour of Whitefish Point Lighthouse Keepers' Quarters  
Great Lakes Shipwreck Museum & Sailors' Cemetery**





# Lesson Writing & Collaboration





Assemble EIGHT Great Lakes Maritime Transportation Chests Education teaching chests for dissemination to museums and education centers in the Great Lakes region.

38 Teaching Chests distributed in Great Lakes watershed:

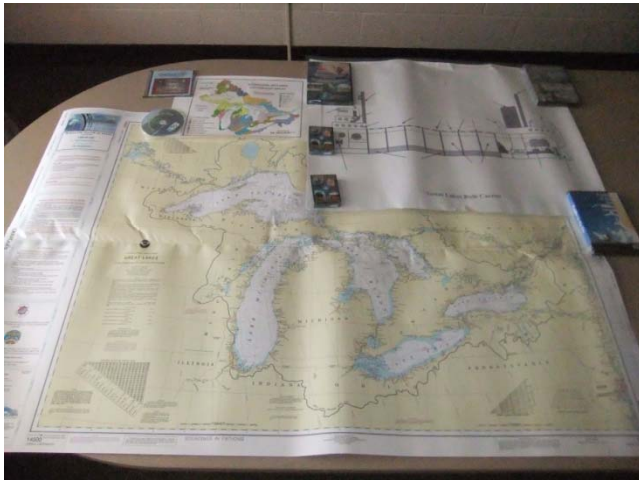
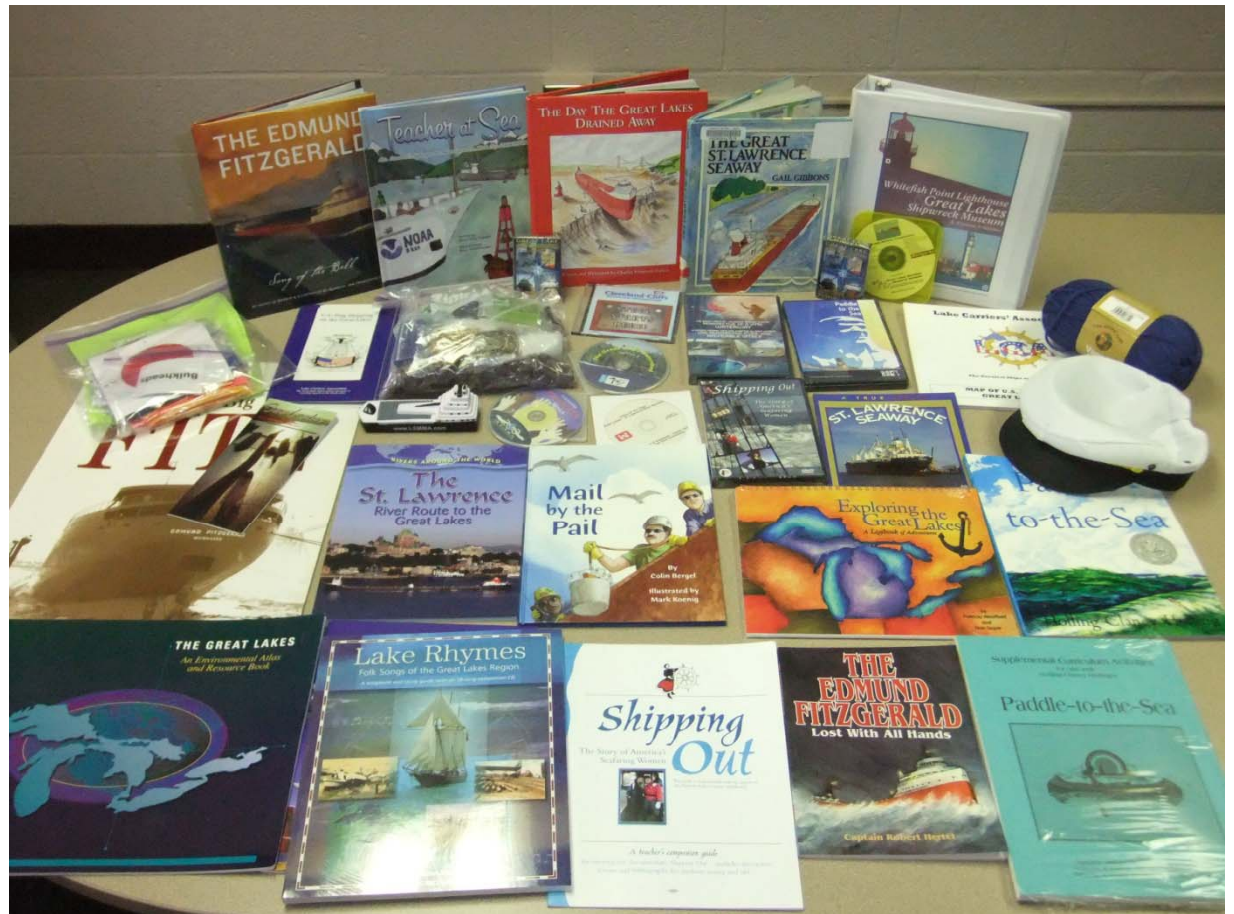
by Great Lake

6-Superior; 13-Michigan, 6-Huron, 12- Erie; 2-Ontario

by State:

17-MI, 2-PA, 9-WI, 1-IN, 6-OH, 3-MN

# Great Lakes Maritime Education Chest





## Great Lakes Maritime Transportation K-12 Education/Outreach Program

Thank you to our program funders:

- Great Lakes Maritime Research Institute
- UW Madison National Center for Freight & Infrastructure Research & Education

**MichiganTech**

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Michigan Technological University

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