

## Introducing the R/V Agassiz

This custom-built, 36-foot, aluminum-hulled vessel supports Michigan Tech's mission in water quality research and education.

The **Agassiz** is available for educational cruises for middle/high school students and teachers, expanding their classrooms to include the waters of Lake Superior and the Keweenaw Waterway. Students have enthusiastically embraced this hands-on learning experience.

The **Agassiz** has undertaken scientific research on Lake Superior with funding from the Michigan Great Lakes Protection Fund, U.S. Environmental Protection Agency, National Science Foundation, and others.



## Scientific Equipment Available Aboard the Agassiz

- Compound and dissecting microscopes
- Secchi disk
- Temperature probe
- Van Dorn water bottle sampler
- Portable spectrophotometer
- Phytoplankton & zooplankton nets
- PONAR sediment dredge
- Handheld scientific probes
- GPS units
- HydroLab for CTD profiles

3/28/06

## Availability

**The Agassiz sails from ice-out (mid-April) through October.**

Each season offers its own opportunities:

**May and June** cruises help integrate principles developed in the classroom over the school year.

**July and August** cruises visit the lakes during their most dynamic period.

**September and October** cruises provide an exciting start to the school year with hands-on experiences that support classroom studies.

## Cost\*

**Half-day (4 hours) \$440**

**Full-day (8 hours) \$850**

\*In 2006, funding from the Michigan Space Grant Consortium will provide 75% of the cost of boat time and faculty scientists for U.P. schools and community education cruises.



MTU faculty are available for **\$60/hour\*** to:

- lead the cruise and conduct sampling,
- provide an in-class, pre-cruise introduction that sets the stage for the cruise,
- conduct a two-hour post-cruise laboratory experience analyzing samples.

## To Make Reservations

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## **Agassiz Information & Registration Form**

<http://techalive.mtu.edu/resources/agassiz/index.htm>

# Water Quality Investigations



## Aboard Michigan Tech's Research Vessel

# Agassiz

*An Opportunity for  
Middle & High School Students to  
Study Lake Superior  
and Connecting Waters.*

Season:  
*mid-April through October*

## Investigation Topics:

*Biological Limnology*

*Physical Limnology*

*Chemical Limnology*

Offered by:

**MichiganTech**

and the

*Western Upper Peninsula Center for  
Science, Mathematics and Environmental Education*

## An Opportunity to Study Lake Superior and Connecting Waters on the Agassiz

Lake Superior is the largest freshwater lake (by surface area) in the world! Yet for many students, this vast body of water will serve only as a backdrop to their lives—a place to live, work and play. However, with the availability of **Michigan Tech scientists and the research vessel (R/V) Agassiz**, students are now able to actively explore the inner workings of the lake and connecting waters through hands-on, guided scientific investigations. An educational cruise aboard the **Agassiz** can inspire students, enhance their interest in science and math, and open the door to future careers.

Water quality investigations aboard the **Agassiz** may be customized to provide age-appropriate activities that complement classroom curricula and meet the needs and interests of students and teachers.

Cruises may be half-day or full-day in length and explore the waters of **Portage Lake, Torch Lake, Keweenaw Waterway, and/or Lake Superior**. Water quality conditions in these systems vary both seasonally and by location, providing a dynamic learning experience. Teachers have the flexibility to tailor the topical content of each cruise to best fit their curricula, with options to address biological, chemical and physical features, or focus on one particular discipline, e.g. the physics of lakes. Trips aboard the **Agassiz** may also include demonstrations of vessel operation, safety and electronic navigation aboard ship, include a laboratory experience after the excursion, or be combined with visits to related sites of interest, e.g. a wetland or wastewater treatment plant, upon request.



### Investigation Topics

Below are examples of topics that can be addressed in educational cruises. These can be tailored to meet students' age level and curricular needs.

#### **Biological Limnology**

A PONAR dredge is used to collect samples of the invertebrate animals which inhabit the bottom sediments. Samples are processed to separate the animals from the sediment and the collection is inspected. Plankton nets sample the phytoplankton and zooplankton that inhabit the open waters. Stops can be made to conduct shoreline seining of the fish community. On board discussion focuses on differences in the diversity of aquatic life in different habitats and the role of invertebrate animals as indicators of ecosystem health.

#### **Physical Limnology**

The physical composition of sediment samples collected with the PONAR sediment dredge is evaluated. The sand-silt-clay content of the sediment is compared for sites at various depths. On board discussion focuses on the role of particle size, density, and their interaction with wave energy in determining sediment character and the types of organisms which inhabit various environments.

#### **Chemical Limnology**

Depth profiles of dissolved oxygen and water temperature are developed at several sites using a HydroLab. Vertical structure in oxygen and temperature is explored as a basis for understanding the significance of thermal stratification. On board discussion focuses on the interplay of physics (temperature), chemistry (oxygen), and biology (oxygen consumption) in determining the oxygen resources of lakes.

### Education Program Coordination

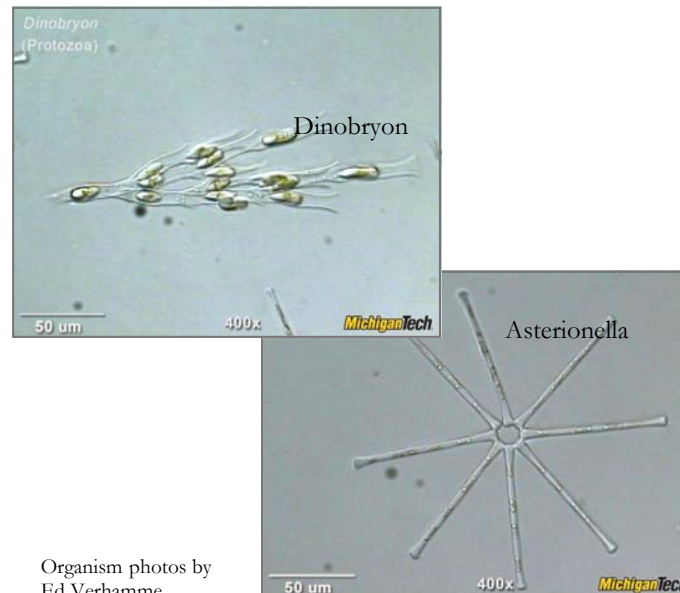
Educational excursions aboard the **Agassiz** are coordinated by Joan Chadde of the Western U.P. Center for Science, Mathematics and Environmental Education. Joan has an M.S. in Water Resources and extensive experience in leading environmental science programs for elementary, middle, and high school students and teachers. Joan can arrange with MTU faculty available to share their scientific expertise and introduce students to the fascinating world of Great Lakes research.

### Safety

The **Agassiz** has been inspected by the U.S. Coast Guard and certified as a passenger vessel. The ship is operated by an MTU captain licensed by the U.S. Coast Guard. The **Agassiz** is equipped with a full complement of safety (life jackets, fire suppression system, lifeboat), navigation (electronic charting, GPS, radar) and communications (cell phone, marine radios, EPIRB) equipment.

### Capacity

The **Agassiz** can carry 19 passengers: the MTU cruise leader, the teacher and 17 students. To facilitate a more hands-on experience smaller groups are encouraged. Teachers are asked to take an active role in program delivery.



Organism photos by  
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