TENTH BIENNIAL
LAKE SUPERIOR
YOUTH SYMPOSIUM

Thursday, May 16 – Sunday, May 19, 2013

Michigan Technological University
Houghton, Michigan

For students & teachers (Grades 7-12) in Michigan, Minnesota, Wisconsin, and Ontario who live in or care about the watersheds of Lake Superior and the Great Lakes.

Register by April 30th online at: lakesuperioryouth.org
# Table of Contents

Welcome ............................................................ 1  
Steering Committee .................................................. 1  
Symposium Funders .................................................. 1  
Past Symposium Hosts, 1995 - 2011 .......................... 2  
Frequently Asked Questions ....................................... 2  
Chaperone Policy .................................................... 3  
Accommodations ........................................................ 3  
Planning Your Trip ................................................... 3  
Registration and Cost ................................................ 4  
What to Bring ........................................................ 4  
Funding Ideas .......................................................... 4  
Other Questions ...................................................... 4  
Field Trip Descriptions ............................................. 5  
Presentation Descriptions ........................................... 12  
Stewardship Projects ............................................... 17  
Keynote Speakers .................................................... 18-19  
Symposium Schedule ............................................... 20-21
Welcome to the 10th Biennial Lake Superior Youth Symposium! We have planned an outstanding event that is sure to inform, inspire and motivate students and teachers to become stewards of Lake Superior and the Great Lakes. The goal of the symposium is to increase understanding of challenging environmental and scientific issues, enhance appreciation for Lake Superior’s beauty and history, promote personal involvement in creating solutions, and encourage participants to build upon their symposium experience in their schools and communities after the symposium.

Michigan Technological University, located on the Portage Waterway, provides an excellent location for the symposium. Participants will be able to take advantage of the excellent laboratories, classrooms, recreational facilities and NEW Great Lakes Research Center available on campus. Likewise, the symposium’s location on the Keweenaw Peninsula in Michigan’s Upper Peninsula of Michigan will provide easy access to a wide variety of water environments to explore during the symposium, including streams, inland lakes, bogs, marshes, and Lake Superior, in addition to the beautiful north woods.

At the symposium, students and teachers will attend presentations and field trips conducted by Michigan Tech University faculty and graduate students, natural resource professionals, artists, writers, historians, and educators. More than 50 different presentations and field trips are planned on a variety of topics, including fisheries and wildlife, water quality, forest ecology and management, geology, Great Lakes threats and uses, conservation, sustainability, writing, art, photography, and student initiatives. Students and teachers will indicate the sessions they wish to attend on their selection form.

On the following pages, you will read about the many exciting and varied field trips and presentations, the fun Saturday night rendezvous at McLain State Park, some helpful websites for planning your trip to Michigan Tech University and Michigan’s Keweenaw Peninsula, and much more!!

See you soon!

Lake Superior Youth Symposium Steering Committee
**Frequently Asked Questions**

**What kinds of sessions and presenters will there be?**
The symposium will offer field trips and presentations on a wide variety of topics. There will be something for everyone’s interest! Sessions will cover Great Lakes history, conservation issues, geology, water quality of streams and lakes, forest ecology, student initiatives in the Great Lakes basin, and the arts—journaling, photography, artistic interpretation, and more! Presenters will be university faculty and graduate students, biologists, foresters, geologists, activists, artists, writers, and educators that represent a diversity of perspectives.

**How do I decide what to attend?**
First, note that the field trips and presentations are divided into major categories. Then read through the descriptions and select topics from a variety of categories, so that you expose yourself to lots of different things. Select a field trip topic that represents a career that interests you. Choose presentations that will teach you something new.

**How do I register for my preferred sessions?**
After reading the descriptions of the field trips and presentations on the following pages, mark the 5 field trips and 10 presentations that you would be most interested in attending on your registration form. We will do our best to schedule you for at least one of your field trip selections and two of your presentation selections. You will receive your schedule when you arrive at the symposium in May.

**Will I get to go to all of my preferred sessions?**
Symposium participants will be scheduled for 1-2 field trips and 5-6 presentations at the symposium. Since many of the field trips and presentations only allow 20 students per session, and most sessions will only be offered once or twice during the symposium, it won’t be possible for everyone to receive all of their selections.

**Do participants have to attend the entire symposium?**
Yes, we want all students and their chaperones to attend the entire symposium. The symposium events are designed to build upon each other, providing a complete experience that you will remember for a long time.

**Can students attend on their own?**
All students must come with a chaperone—a teacher, 4-H leader, scouting leader, parent, or other adult. (There must be one adult chaperone for every 10 students per group.)

**Do all students have to stay overnight?**
All students must stay overnight (with their chaperones). One chaperone for every ten students is required. Since programs will begin immediately after breakfast and run until 11 PM, it is much safer and a lot more fun, for students to stay in the Michigan Tech residence hall. (Sheets and towels provided.)

**What is expected of teachers/chaperones?**
Teacher/chaperones are expected to manage their group of students to ensure that students behave properly and attend programs on-time. During the day, chaperones may participate in sessions of their own choosing, since students will be in a supervised situation either on a field trip or in a presentation. See chaperone policy.
All students must come with a chaperone. At least one chaperone is required for every 10 students that each school or organization sends to the symposium. Chaperones must:

♦ be a teacher, AmeriCorps member, parent, board member or administrator from the organization;
♦ remain in attendance and be responsible for students at all times;
♦ monitor students for appropriate behavior;
♦ stay in the Michigan Tech Residence Hall with their students overnight;

Please notify Shawn Oppliger at 906-231-0522 or shawn@copperisd.org if your group’s chaperone will be replaced by another chaperone at anytime during the symposium.

All students and teachers will spend three nights in Michigan Technological University residence halls from Thursday, May 16, through Sunday, May 19. Meals will be provided from Thursday dinner through Sunday breakfast. Sunday lunch is optional (additional cost; reserve at check-in). Your registration fee will cover your meals, lodging, and all of the symposium programs.

Planning your trip to the Symposium and the Keweenaw Peninsula:

Michigan Technological University  
http://www.mtu.edu/

City of Houghton, MI  
http://www.cityofhoughton.com/

City of Hancock, MI  
http://www.cityofhancock.com/

Michigan’s Keweenaw Peninsula  
http://www.keweenaw.info/
REGISTRATION, WHAT TO BRING, FUNDING IDEAS & QUESTIONS

REGISTRATION

Deadline: April 30, 2013

- $140 USA per participant (student, teacher or chaperone)
- One Field Trip and Presentation Selection Form per participant.
- One Group Registration Form (filled out by lead chaperone/adult)

*One adult per 10 students is required (see page 3).

FUNDING IDEAS

Look for Sponsors in Your Local Community

Students and teachers are encouraged to try and find a local sponsor to help with registration and travel costs. Many of the following organizations support environmental education, teacher training, and student involvement in their community. Call or write to the organizations in your local area to inquire about the possibility of having them sponsor students or teachers to attend the symposium.

- Community Foundations
- County Conservation Districts
- Trout Unlimited Chapters
- Sportsmen’s Clubs
- School Foundation / School Board
- Banks
- Businesses
- Churches

Availability of sponsorships will be posted on the symposium website.

WHAT TO BRING

Bring casual clothes that are appropriate for a wide range of weather conditions—warm, cold, rainy, etc.

- Tennis shoes or water shoes and walking shoes
- Day pack for field trips
- Water bottle
- Rain gear
- Warm jacket
- $5-$10 for snacks and incidentals

Note: Linens & towels provided

*Each group should bring a container of water from their location for the opening ceremony.

QUESTIONS

For more questions please contact::

Joan Chadde, Symposium Coordinator
Center for Science and Environmental Outreach
Michigan Technological University
115 Great Lakes Research Center
1400 Townsend Dr., Houghton, MI 49931-1295
Tel: 906-487-3341 Fax: 906-487-1029
Email: jchadde@mtu.edu

The Lake Superior Youth Symposium will be a fun-filled, enriching, educational experience. Schools and youth groups in the Great Lakes watershed and beyond are encouraged to take part!
FIELD TRIP & PRESENTATION DESCRIPTIONS

ABOUT SIGNING UP FOR FIELD TRIPS AND PRESENTATIONS
Symposium participants will be scheduled for 1-2 field trips and 2-4 presentations during the symposium. Since many of the field trips and presentations only allow 20 students per session, and most sessions will only be offered once or twice during the symposium, it won’t be possible for everyone to attend every session they select!

♦ Each participant will choose their field trip and presentation selections on their own online form: Field Trip and Presentation Selection Form

FIELD TRIPS (3 hours)
Morning and afternoons on Friday, May 17, and Saturday morning, May 18

CONSERVATION

A-2 Land Trusts And Land And Water Conservation And Stewardship
Pat Toczydlowski, Keweenaw Land Trust
Visit several nature preserves to experience first-hand how local land trusts are preserving land today for tomorrow. Keweenaw Land Trust preserves protect important areas and keep them open to the public. Hike the Pilgrim Watershed and Paavola Wetland trails all built by volunteers, including youth!

A-3 Use of Mobile Technology in Environmental Science
Chad Norman, Technology Educator, Michigan Technological University
Learn about ways environmental scientists are using mobile technology (Android Smartphones, iPhones and iPads) to collect and share data. The field trip will visit a field site to use these mobile apps to collect data and create multimedia presentations.

FISHERIES & WILDLIFE

B-1 Frogs As Bioindicators—Conducting Frog Calling and Deformity Surveys
Amy Schrank, School of Forest Resources & Environmental Sciences, Michigan Technological University
Why are frogs and other amphibians considered bioindicators? What is causing declines in the frog population and frog deformities? You will learn how to identify frog species of the Lake Superior region, how to determine frog population size and distribution, and conduct a frog deformity survey at a nearby wetland. Ribbet!
**B-2 The Art of Seeing, Hearing, & Smelling the Wilderness: Tracks, Bones, and Scat**

Michelle Miller, Center for Science & Environmental Outreach, Michigan Technological University

While seeing wildlife in their natural habitat is a rare and special experience, every time we venture into the forest, we have the opportunity to experience the animals and plants that live there. Animals may be elusive, nocturnal or shy, but the evidence of their presence unfolds when we take time to notice the skeletal remains, tracks, scat and other clues. Every bone we find tells a story of the life, natural history and death of the animal, and all of the other signs and smells give us a glimpse of the world of our fellow species. On this field trip, we’ll discuss wilderness tips and ethics for being a nature detective, and take a hike to search for bones, tracks, scat and other ecological clues.

**B-3 Monitoring Fish Populations**

**Copper Country Chapter of Trout Unlimited**

Explore the fish and macroinvertebrate communities in the Pilgrim River of the Lake Superior watershed. Investigate the characteristics of good trout habitat, how to identify different species of fish, and how electro-shocking equipment is used to measure the size and distribution of fish populations in streams and lakes. Sample macroinvertebrates to observe the food chain that supports trout populations and learn how to tie flies that trick the trout into thinking that “dinner” is served!

**B-4 Compare the Aquatic Ecosystems of Two Streams**

Casey Huckins, Professor & Research Scientist, Dept. of Biological Sciences, Michigan Technological University

Travel to Coles Creek and Huron Creek where you will compare the composition of macroinvertebrate communities and discuss the possible effects of various land-uses.

**B-5 Look Out Below!!**

Jamey Anderson & Mike Abbott, Research Associate & Operations Manager, Michigan Tech Great Lakes Research Center

Exploring the Great Lakes with Remotely Operated Underwater Vehicles (ROVs), we will briefly show past mission video while discussing the capabilities and challenges of operating ROV’s in support of science on the Great Lakes. We will then head out to the GLRC docks, and after a brief training session, begin taking turns running the ROV’s through one of several missions. Mission might include reading small print on a submerged object, retrieving and placing objects on the bottom, collecting sediment samples, etc.
**B-6 Insectigations**

Chris Hohnholt, Director of Development and Outreach, School of Forest Resources and Environmental Science, Michigan Technological University

Are you fascinated by these crawling, flying, burrowing creatures that some find annoying but that really ‘run the world’? Insects come in all sizes & shapes. Some help us and some harm us. We’ll explore invasive insect species, pollinators, and insects critical role in the terrestrial (and aquatic) food webs.

---

**C-2 Lichens as Bioindicators**

Karena Schmidt, Naturalist, School of Forest Resources & Environmental Sciences, Michigan Tech University

Walk through forests and along the Lake Superior shoreline and become acquainted with the abundance of different lichens growing in the Great Lakes region. Your curiosity will pique as you find out how these unique ecosystems yield insights about symbiosis, forest succession, wilderness survival and even air quality!

---

**B-7 Birds: Harbingers of Spring and Environmental Health**

Amber Roth, Research Assistant Professor, School of Forest Resources & Environmental Sciences, Michigan Tech University

This is a great time of the year for seeing birds on migration. We’ll spend the morning near campus walking trails through some diverse habitats—riverine, wetland, forest, and field. Learn how to identify birds by both sight and sound. Dress for the weather including hiking shoes or boots for wet, muddy trails. Bring your own binoculars if you have them. We’ll have extras on hand.

---

**C-3 Be a Forester for A Day**

James M. Schmierer & Jim Rivard, Foresters, School of Forest Resources & Environmental Science, Michigan Technological University

Measure tree growth, seedling density and learn the identification and natural history of different wildlife and plant species and the different habitats they live in.

---

**C-4 Non-Native Invaders of Our Forests**

Anne Collins, Project Coordinator for the Center for Exotic Species/Invasive Species Ecologist/Forester, Michigan Technological University

Many insect pests and non-native plants have invaded our forests causing considerable ecologic and economic impact, and changing the forest composition and biodiversity. We'll go out and identify many invasive species and evaluate different ways for monitoring their presence and controlling their spread—traps, pheromones, etc.
**FIELD TRIP DESCRIPTIONS**

---

**C-6 Forest Health**

Tara Bal, PhD student, School for Forest Resources & Environmental Sciences, Michigan Technological University

Using forestry measurement equipment, you will conduct a forest health survey to assess the percentage of trees with natural or artificial wounds or stress. Discover the causes stress and identify the signs and symptoms of insects and disease.

---

**GEOLOGY**

**D-1 Lake Superior Geology & Collecting Minerals in the Keweenaw**

Emily Gochis and Hans N. Lechner, Ph.D. Students, Geological and Mining and Engineering Sciences, Michigan Technological University

We will make several stops to see unique features of Lake Superior geologic history and visit some deposits of naturally occurring metallic copper. These were formed over a billion years ago, when hot, aqueous solutions flowed through open fissures and porous layers of conglomerate and basalt, depositing the copper as they cooled creating three different kinds of deposits or lodes: fissure veins, conglomerate lodes and amygdaloid lodes.

**D-2 Shifting Shores and Eroding Beaches**

Dr. Barb McTaggart, Geologist, Isle Royale National Park

Lake Superior is a highly changeable lake. One of the many things that change is the lake’s shoreline. We will learn about the natural processes that control shoreline positions, and observe how human activities have impacted shorelines. We will visit both eroding and building shorelines and learn how shoreline property owners can contribute to shoreline protection efforts.

---

**RECREATION**

**N-1 Paddling on the Canal**

Michigan Tech’s Outdoor Adventure Program

Try out kayaking, canoeing, and/or stand up paddle boards to explore the Portage Waterway.

**N-2 Mountain Biking at Michigan Tech Trails**

Michigan Tech’s Outdoor Adventure Program

Try out mountain biking on [Michigan Tech’s awesome trail system](#) (choose the Beginner or Intermediate ride on the selection form).

**N-3 High Ropes Course**

Michigan Tech’s Outdoor Adventure Program

Push your comfort zone and go beyond your personal boundaries, i.e. fear of heights, etc. to complete these challenging activities. Participants will work as a group. Check out the zipline!
**SUSTAINABILITY**

**E-1 Healthy Environments Lead to Vibrant Economies**

Tom Tikkanen, Director, MainStreet Calumet and Houghton County Commissioner

Take a walk through the streets of historic Calumet Village, first settled in the 1840s and home to commercial copper mining for the next 125 years, to see how MainStreet Calumet went about rebuilding and enhancing their downtown to help it become vibrant economically & socially once again.

**E-2 Artists’ & Farmers’ Market at Algomah Acres Honey Farm**

Melissa Hronkin, Apiarist & Proprietor of Algomah Acres Honey Farm (Mass City)

Tour an active beeyard and honey house with a skilled apiarist, and meet with artists that work with natural materials found in their local environment, including peace crane mobiles, weaving, beach glass, and more.

**E-3 Community Supported Agriculture Farm Tours**

Ransom Farm (Houghton), Grego Farm (Atlantic Mine), or Wintergreen Farm (Ontonagon)

Several farm tours are available that will show how Community-Supported Agriculture (CSAs) works. Some tours specialize in specific products, like fresh goat cheese (chevre), honey, etc. while others grow a wide variety of fruits and vegetables that are available May through October and are sold to those who purchase “shares” in the farm’s seasonal produce or sold at local farmers’ markets.

**E-4 Sustainable Building & Site Design**

Karin Cooper, architect, Upper Peninsula Engineers & Architects

Tour local homes and businesses that use innovative features designed to save energy or reduce air and water pollution, reduce stormwater runoff, use recycled materials, and/or reduce waste.
**F-5 Using Solar Power and Groundwater to Irrigate High-Bush Blueberries**

John Gierke, Professor and Farmer, Dept. of Geological Sciences & Mining Engineering, Michigan Technological University

Visit a commercial farm and see how a water well and the sun can be used to sustainably provide water to crops. Perform a test of the well to determine its capacity to produce water, and see how the system will operate with sunshine. You will learn about the local geology and how it affects the bushes and the type of well and pumping system used for the irrigation.

**F-2 Great Lakes Areas of Concern and the Torch Lake Restoration Project**

Bruce Petersen, USDA Natural Resources Conservation Service (retired) and Nick Squires, science teacher, Lake Linden-Hubbell High School

One hundred years of copper mining has left its mark on Lake Superior. Tour the Trap Rock River watershed and see one of the sources of stamp sand sediment to Torch Lake. Monitor the stream macroinvertebrates and copper concentrations above and below the discharge area to see the effects of the stamp sand on the biological diversity of the river. Find out the different streambank and shoreline restoration techniques being applied.

---

**WATER QUALITY OF STREAMS AND LAKES**

**F-1 How Do Scientists Assess the Health of the Great Lakes?**

Dr. Martin Auer and Marcell Dijkstra, Professor and PhD Student, MTU Dept. of Civil & Environmental Engineering, Michigan Technological University

Spend 1-1/2 hours on Michigan Tech’s research vessel *Agassiz* using a variety of equipment to collect data on dissolved oxygen, water clarity, pH, conductivity, depth, sediment, and plankton. Then bring your samples into the lab for analysis. Dissect a trout stomach to see what they’ve been eating and their role in the Lake Superior food web.
**Writing, Photography & Art**

**G-1 Slogging Around the Keweenaw**
Lloyd Wescoat, Lake Superior Stewardship Initiative

What is a SLOG? A SLOG is a science log that contains your observations, thoughts, drawings, and doodles. Slogging is the recording of your observations and feelings about the natural world. On this field trip, you will visit a variety of inspiring locations in the Keweenaw and learn how to use nature journaling techniques to record their experiences.

**G-2 Photographing Nature**
Steve Brimm, photographer, Copper Harbor, MI

What are the techniques used to create a photograph that tells a story or communicates an idea? Learn to take photographs that are truly worth a thousand words.

Online gallery at: www.brimmages.com

Photo by Steve Brimm

**G-3 Botanical Drawing**
Barb Flanagin, artist

Drawing is a path into the inner beauty and workings of the natural world, and a great way to highlight the wonders of the Lake Superior watershed. Receive tips for drawing plants as a way to understand how they are put together and their strategies for survival.
PRESENTATION DESCRIPTIONS

PRESENTATIONS (75 minutes)
Mornings and afternoons
Friday, May 18 and Saturday, May 19

CONSERVATION

H-1 Managing Natural Resources from a Modern-Day Native American Perspective
Jessica Koski and Erin Johnston, Keweenaw Bay Indian Community

Examine several environmental issues facing Lake Superior from a tribal perspective. Discuss threats to the Lake Superior watershed, including climate change, invasive species, and contaminants in fish, and share information about how the Keweenaw Bay Indian Community is participating in bi-national efforts to address these issues. Investigate the social complexity of addressing these environmental issues.

H-3 Inspiring Acts of Stewardship
Alexa Bradley, Program Director, On The Commons, Great Lakes Commons Initiative

One way to be a steward of Lake Superior is to inspire others to care too. This session will explore creative, fun and innovative ways of connecting people in our schools and communities to our waters. We will consider what we mean by stewardship of our waters and then work together to design some possible projects for the coming year that could happen anywhere. All ideas and projects will be linked and featured on the On The Commons and Great Lakes Commons websites and uploaded to the Great Lakes Commons map.

H-4 What Is Your Recycling IQ?
Dr. Hugh Gorman, Dept. of Social Sciences, Michigan Technological University

Recycling can be confusing. In some cities, you can recycle practically anything, and in some countries, there are recycling containers on almost every corner. But in other places, you’re lucky if you can recycle newspapers! Find out what is needed to make recycling work, economically and socially. Just because you have recycling centers, doesn’t mean everyone will do it. Why not? Discover the steps and the requirements for effective recycling.

H-5 Chocolate Chip Cookies & Mining in the Great Lakes Region
Linda Rulison, retired Hancock Middle School Social Studies Teacher

Mining companies are looking at the Upper Peninsula as a possible place to begin mining for minerals again. Be a mining engineer who is interested in extracting valuable resources quickly and safely for both the miners and the environment by using chocolate chips as the valuable resource to be mined out of a chocolate chip cookie. You will be given the tools and will then have to create a process for extracting the chocolate chip resources safely and quickly while causing as little damage to the cookie environment as possible.
**H-6 Aquaponics: Cleaning Water by Growing Fish & Veggies Together!**

Robert Handler, Sustainable Futures Institute, Michigan Technological University

Aquaponics is a system of farming where aquaculture (fish farming) and hydroponics (growing plants without soil) are combined to help both crops grow better than they could by themselves! We have started an aquaponics system in a greenhouse on campus that is growing tilapia and many different vegetables, while serving as a great teaching tool. See the aquaponics system and find out why this method of growing food is becoming very popular.

**H-7 The Watershed Activist Toolkit**

Superior Watershed Partnership & Land Trust

Learn why watershed boundaries make more sense than political boundaries. Become a watershed activist; learn how watersheds play an important role in almost every Lake Superior issue and almost every global issue; water quality, habitat protection, climate change and more. Which watershed do you live in? Participants will be inside and outside conducting mock interviews, environmental assessments and other fun stuff.

**H-8 Who Will Define the Future of Our Lakes?**

Alexa Bradley, Program Director, On The Commons, Great Lakes Commons Initiative

The Great Lakes are a remarkable gift of nature that seem infinite and inexhaustible, yet they are threatened on many fronts. How can we as citizens of the Lakes insure a thriving future for our waters? What do we think the first principles of water stewardship ought to be? Who do we think should benefit and decide about water use? Become a part of an historic citizen-led creation of a new social charter for the Great Lakes. The ideas from this workshop will become part of the Great Lakes Commons Charter development, a bio-regional effort. All ideas and outcomes will be linked and featured on the Great Lakes Commons website and uploaded to the Great Lakes Commons map.

**H-9 I Am Water**

Alexa Bradley, Program Director, On The Commons, Great Lakes Commons Initiative

Become a part of a public art-making project and eventual installation involving the words and wishes of hundreds, perhaps thousands, of people throughout the Great Lakes. Ponder, discuss, and articulate your connection to our planet’s water. Then write a wish, hope, prayer, or other message to the water on a 5 x 2.5 inch piece of white Tyvek. We will provide the materials and will link all participants to the outcomes (video, images, Great Lakes Commons website, etc).
**H-10 Living in a Water-Short World—Stories from Africa and Latin America**

Global Cities, Michigan Technological University

While North Americans may feel like they are water-rich, 2 billion people in the world lack access to safe drinking water. This problem is a cause of major health problems and mortality throughout the developing world. This session will be taught by students entering the Peace Corps to work on water problems. They will inform you about current water issues in places like Central America and Africa. What lessons can we learn from these other cultures, for us and Lake Superior?

**FISHERIES & WILDLIFE**

**I-1 Wolf Ecology in the North Woods**

Nancy Warren, Timber Wolf Alliance

The timber wolf abounds in the north woods. What are their habitat requirements, population distribution, and food sources? Learn about wolf adaptations, social interactions, communication, and human threats to wolf survival.

**I-2 Sturgeon Ecology**

Nancy Auer, Professor, and Cameron Goble, PhD student, Dept. of Biological Sciences, Michigan Technological University

Visit a sturgeon research lab to view live sturgeon and examine the sampling gear used in scientific research. Learn about sturgeon ecology—food preferences, reproduction, life stages, and habitat requirements. Discuss the important role of sturgeon in Native American culture and do a Mark-Recapture Sampling exercise.

**H-11 Engineering Our Sustainable Future**

Joshua Pearce, Associate Professor, Dept. of Materials Science & Engineering and Dept. of Electrical & Computer Engineering, Michigan Technological University

Suppose you could replace “Made in China” with “Made in my garage.” Suppose every time you polished off a plastic jug of milk, you would be stocking up on raw material to make anything from a cell phone case and golf tees to a toy castle and a garlic press. Find out about open-source 3D printing that can save thousands of dollars by making almost everything out of recycled material!

**M-1 Invasive Plants: An Ecological Challenge**

Danielle Miller and Christopher Cantway, The Nature Conservancy

Complete a rapid invasive plant assessment, conduct plant surveys and plant identification, learn mapping techniques, evaluate ecological threat, and develop a simple restoration plan.
M-2  Great Lakes Forests, Carbon, Climate Change
Kristen Schmitt and Danielle Shannon, Northern Institute for Applied Climate Science
Investigate the role that forests play in sequestering and storing carbon, and some of the changes that forests in the Great Lakes are facing due to a warming planet. Find out how people in the Great Lakes region are working to help forests adapt to climate change.

J-3 Sustainable Transportation: Public Transit, Pedestrian and Bicycles in Urban Areas
Dr. William Sproule, Dept. of Civil and Environmental Engineering, Michigan Technological University
Examine alternate ways to move people in urban areas. What are the benefits for the economy, community aesthetics, and human health?

J-4 Is Wind A Part of Our Energy Future?
Engineer Leonard Bohman, Dept. of Mechanical Engineering, Michigan Technological University
Find out the challenges and potential role of wind in providing electricity for schools, homes and businesses. Design wind turbine blades to maximize the energy produced.

J-5 Great Lakes Ports and the Urban Economy
Louise Dyble, Dept. of Social Sciences, Michigan Technological University
We will look at the history of Great Lakes Ports over the past fifty years and their relationship with changing technologies, regional industries, environmental policies, and city economies.
J-6 Water Chemistry of Climate Change
Sarah Green, Chair, Dept. of Chemistry, Michigan Technological University

How does a changing climate affect the water chemistry of the Great Lakes, and in turn, the organisms that live there, and ultimately us?!

J-7 Sparkling Water: Would You Drink It?
Anika Kuczynski, graduate student, Dept. of Civil & Environmental Engineering, Michigan Technological University

Where does wastewater come from and what does it become? In this activity become an “environmental engineer” by designing and testing a process to clean wastewater. Would you drink “cleaned” wastewater?! They do in space and in Los Angeles!!

J-8 Water Without Borders?
Emma Norman, Assistant Professor, Dept. of Social Sciences, Michigan Technological University

How do we manage water when it flows across political borders? Explore the tensions and opportunities of managing our precious water resources with upstream and downstream neighbors. Learn why the international community is looking towards the Great Lakes for solutions on how to better manage our global water supply? See why many people are starting to refer to the Great Lakes as "The Freshwater Nation".

J-9 A-Maze-ing Water: Low Impact Development
Dr. Brian Barkdoll, Dept. of Civil & Environmental Engineering, Michigan Technological University

Where does the water, road salt, sediment, motor oil, and animal wastes on our streets, lawns, and fields go? Take a walk around campus to discover what happens when it rains. What can we do to help storm water stay put and keep pollution out of lakes and streams?

STUDENT INITIATIVES IN THE GREAT LAKES BASIN

K-1 Students Design ROVs for Isle Royale National Park, Inventory Their Township Forest, and Conduct Research & Stewardship of their School Forest
Dollar Bay High School's Student Organization of Aquatic Robotics (SOAR), Washington Middle School, and Houghton High School

SOAR students will describe how they designed a remotely operated vehicle (ROV) for the National Park Service on Isle Royale National Park to conduct zebra and quagga mussel surveys....and won a national service award! Washington Middle School students will explain how to conduct a forest inventory—measuring tree diameter, height, crown density and merchantability, sample soil texture, and gather other data needed to develop a forest management plan. Houghton High School students will describe the variety of research projects underway at their school forest.

WRITING, PHOTOGRAPHY & ART

L-1 Poetry of Science and Nature
Laura Smyth, Keweenaw Writers Workshop

Read and discuss poetry inspired by science, nature, and a sense of wonder for the natural world. We will look at the ways scientists and writers have found shared inspiration, worked together, and the part played by language and imagination in their different approaches to the world around us.
**L-2 Drumming: Mother Earth’s Heartbeat**

Bill Anderson, Drum Circle Leader, Blue Heron Drums

Re-connect with the heartbeat of Mother Earth in this introduction to the world of acoustic hand drumming. After a brief question and answer period everyone, from beginners to advanced players, will learn a variety of drum playing techniques.

**L-3 The Turning Points Personal Narrative Model: Speak, Write and Share Your Experience**

Jenifer Strauss, Speaker, Literacy Coach and Hub Leader, Grand Traverse Stewardship Initiative, Grand Traverse Conservation District

How do you translate your environmental stewardship experience and knowledge into a powerful message for others to hear? The Turning Points Model will provide you with powerful speaking and writing tools to use in editorials, blogs, and public speaking forums. The human brain is wired for story. People listen, learn, and retain information best when it is communicated in narrative. Your well-crafted stewardship story can be the catalyst for change!

---

**Stewardship Projects**

Symposium participants will engage in stewardship projects led by schools, community organizations and units of government to support and facilitate students’ skill development and ability to plan and conduct stewardship projects in their communities following the symposium.

Saturday afternoon, May 18, will be stewardship project day with every participant being able to select a stewardship project to contribute to. The students will do approximately 2 hours of work.

Stewardship projects include:

- removing invasive species
- preparing/mulching garden beds
- conducting invasive species inventory
- collecting data on stream macroinvertebrate communities
- weeding/planting native species
- making and clearing trails
- planning interpretive signage for a site
The Great Lakes are the heart of Anishinaabe (Ojibwe) territory. In Anishinaabe culture, women are the water’s caretakers, responsible for protecting the water. Water Walkers converged on Lake Superior from all four directions, carrying water in copper pails from the Pacific Ocean, the Atlantic Ocean, the Gulf of Mexico and Hudson Bay. Walkers—including many Anishinaabe women, men and children—journeyed almost ten and a half million steps together to raise awareness of the need for all people to care for the sacred gift of water. Esie Leoso-Corbine and several fellow Water Walkers from the Bad Indian Reservation in Wisconsin will share their thoughts on the future of Great Lakes water.

Matt and Hannah Abbotts will describe their circumnavigation of Lake Superior in sea kayaks in 2009. Although neither were experienced sea kayakers, the couple was drawn to the big lake and the challenges of an expedition. After five months of planning, Matt and Hannah embarked on what would be a 72-day paddle around Lake Superior. The adventure provided them with many stories which they will share, and was the inspiration for continued expeditions on large bodies of freshwater around the world.

The Four Directions International Water Walkers’ journey.

A painting depicting Matt and Hannah’s sea kayak adventure on Lake Superior.
Ron Hobart, storyteller, musician, and paddle-maker, has enthralled audiences of all ages for many years with his portrayal of the 17th century voyageur, Louis Baron, garbed in authentic clothing—muslin shirt, canvas pants, wool socks, and moosehide moccasins. On Saturday evening, Ron will conduct a rendezvous for all symposium participants at McLain State Park (weather permitting). Rendezvous revelers will actively participate—wrestling, singing, and playing games around the campfire, much like our predecessors did 300 years ago. Ron will tell lively stories of his fellow voyageurs as they travel the woods and waterways of North America, while co-existing peacefully with the Native Americans.

Ron Hobart has been presenting programs on the lifestyle of the voyageurs to schools, camps, and corporate groups since 1980. He paddled from Montreal, Canada through the Great Lakes to the Gulf of Mexico on an 8-month, 3300 mile expedition, re-enacting LaSalle’s 1682 claiming of the Mississippi River Valley for France. He traveled with 24 men over the same portages and waterways as their 17th century counterparts. This experience provides depth and zest to his performances.

Dr. Auer is a professor in the Michigan Tech Department of Civil & Environmental Engineering, specializing in surface water quality and Great Lakes research. Dr. Auer has conducted field research on Lakes Huron, Michigan and Superior, as well as many inland lakes and rivers. Dr. Auer is known for his passion for teaching at all levels, from elementary to college level. He will inspire us to protect the future water quality of the Great Lakes.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THURSDAY, MAY 16, 2013</strong></td>
<td></td>
</tr>
<tr>
<td>3:00-6:00 pm</td>
<td>Check-in (Wadsworth Hall lobby) &amp; group tours of campus</td>
</tr>
<tr>
<td>6:00-7:00 pm</td>
<td>Dinner</td>
</tr>
<tr>
<td>7:30-7:45 pm</td>
<td>Opening Ceremony (Fisher 135)</td>
</tr>
<tr>
<td></td>
<td>• Lake Superior Drumming by Blue Heron Drums</td>
</tr>
<tr>
<td></td>
<td>• Slide Show of Lake Superior</td>
</tr>
<tr>
<td>7:45-8:00 pm</td>
<td>Welcome (Glenn Mroz, President, Michigan Technological University</td>
</tr>
<tr>
<td>8:00-8:30 pm</td>
<td>Four Directions International Water Walkers (Bad River, WI)</td>
</tr>
<tr>
<td>8:30-9:00 pm</td>
<td>“Your Mission Is….“ Opening Address by Chris Hohnholt</td>
</tr>
<tr>
<td></td>
<td>• Sharing of the Waters</td>
</tr>
<tr>
<td></td>
<td>• Who Is Here----each state delegation stands, etc.</td>
</tr>
<tr>
<td></td>
<td>• Symposium Logistics – SLEEP is required!</td>
</tr>
<tr>
<td>9:00-9:30 pm</td>
<td>Snack Social (Fisher 135 Hallway)</td>
</tr>
<tr>
<td>9:30-10:15 pm</td>
<td>Student TEAM Groups meet (locations assigned)</td>
</tr>
<tr>
<td>11:00 pm</td>
<td>Lights Out</td>
</tr>
<tr>
<td><strong>FRIDAY, MAY 17, 2013</strong></td>
<td></td>
</tr>
<tr>
<td>7:00-8:00 am</td>
<td>Breakfast</td>
</tr>
<tr>
<td>8:30-9:00 am</td>
<td>A Kayak Trip around Lake Superior by Mike &amp; Hannah Abbotts</td>
</tr>
<tr>
<td>9:15-12:15 pm</td>
<td>Field trips</td>
</tr>
<tr>
<td>9:15-10:30 am</td>
<td>Presentations</td>
</tr>
<tr>
<td>10:45-Noon</td>
<td>Presentations</td>
</tr>
<tr>
<td>Noon-1:00 pm</td>
<td>Lunch</td>
</tr>
<tr>
<td>1:15-4:15 pm</td>
<td>Field Trips</td>
</tr>
<tr>
<td>1:15-2:30 pm</td>
<td>Presentations</td>
</tr>
<tr>
<td>2:45-4:00 pm</td>
<td>Presentations</td>
</tr>
<tr>
<td>4:15-5:00 pm</td>
<td>Free time</td>
</tr>
<tr>
<td>5:00-6:00 pm</td>
<td>Dinner</td>
</tr>
<tr>
<td>6:30-7:30 pm</td>
<td>Student TEAM Groups meet (locations assigned)</td>
</tr>
<tr>
<td>8:00-9:00 pm</td>
<td>Quiz Bowl (641 Dow)</td>
</tr>
<tr>
<td>9:00-11:00 pm</td>
<td>Movies: Chasing Ice</td>
</tr>
<tr>
<td>11:30 pm</td>
<td>Lights Out</td>
</tr>
</tbody>
</table>
## Symposium Schedule

### Saturday, May 18, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30-8:30 am</td>
<td>Breakfast</td>
</tr>
<tr>
<td>8:45-11:45 am</td>
<td>Field Trips</td>
</tr>
<tr>
<td>8:45-10:00 am</td>
<td>Presentations</td>
</tr>
<tr>
<td>10:15-11:30 am</td>
<td>Presentations</td>
</tr>
<tr>
<td>11:30-12:30 pm</td>
<td>Lunch</td>
</tr>
<tr>
<td>12:45-1:00 pm</td>
<td>Load buses to go to Stewardship Projects</td>
</tr>
<tr>
<td>1:00-4:00 pm</td>
<td>Stewardship Projects <em>(choose at check in)</em></td>
</tr>
<tr>
<td>4:45 pm</td>
<td>Load buses* for McLain State Park</td>
</tr>
<tr>
<td>5:45 pm</td>
<td>BBQ dinner (McLain State Park Covered Pavilion)</td>
</tr>
<tr>
<td>6:30 pm</td>
<td><em>Rendezvous! with Ron Hobart, Spirit of the Voyageur</em> (McLain State Park)</td>
</tr>
<tr>
<td>7:45 pm</td>
<td>Load buses to return to MTU</td>
</tr>
<tr>
<td>8:30-10:30 pm</td>
<td>Recreational Activities — basketball, wallyball, raquetball, climbing wall, ultimate Frisbee, board games, etc. (Student Development Complex)</td>
</tr>
<tr>
<td>11:00 pm</td>
<td>Lights out</td>
</tr>
</tbody>
</table>

*All buses leave from behind Wadsworth Hall*

### Sunday, May 19, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30-8:30 am</td>
<td>Breakfast</td>
</tr>
<tr>
<td>8:45-9:15 am</td>
<td>“What’s Next?” Marty Auer, Professor Extraordinaire</td>
</tr>
<tr>
<td>9:30-10:30 am</td>
<td>Student TEAM Groups meet to finalize stewardship project plans</td>
</tr>
<tr>
<td></td>
<td>• Symposium Evaluation</td>
</tr>
<tr>
<td>10:30-11:45 am</td>
<td>Presentations <em>(3 min. per group, plus 2 min. between) by Student TEAMs (Fisher 135)</em></td>
</tr>
<tr>
<td>11:45-12:15</td>
<td>Closing Ceremony <em>(Fisher 135)</em></td>
</tr>
<tr>
<td></td>
<td>• Symposium Recap Slide Show</td>
</tr>
<tr>
<td></td>
<td>• Pass the Torch to 2015 symposium hosts</td>
</tr>
<tr>
<td>12:15 - 2:00 pm</td>
<td>Departure. See you in 2 years!!</td>
</tr>
<tr>
<td></td>
<td><em>Miigwetch! (Thank you!)</em></td>
</tr>
</tbody>
</table>

*Miigwetch! (Thank you!)*
When the well is dry, we know the worth of water.
— Benjamin Franklin

A river is more than an amenity, it is a treasure.
— Justice Oliver Wendell Holmes

Water is the driving force in nature.
— Leonardo de Vinci

“Those who dwell, as scientists or laymen, among the beauties and mysteries of the earth, are never alone or weary of life.”
— Rachel Carson

The frog does not drink up the pond in which he lives.
— Native American Proverb

If there is magic on this planet, it is contained in water.
— Loren Eisely

All the water that will ever be is on Earth right now.
— National Geographic

There is no life without water.
— Albert Szent–Gyorgyi

“Those who contemplate the beauty of the earth find strength that will endure as long as life lasts.”
— Rachel Carson