

# 2014 Water Festival Activity Descriptions

## All Day Sessions

### **1. Organic Matters: Biodiversity and Sustainable Gardening Practices**

Let's explore how soil affects water, and how gardening techniques can impact water quality and the food web, for better or for worse.

Quincy Higgins Arney, MTU Master Gardener

**Location:** Lower level patio, meet next to stairwell door

### **2. Great Lakes Watery Movements**

What do *freeze tag*, *follow-the-leader*, and *telephone* games have to do with the Great Lakes? Students will transfer Great Lakes subject matter into movements. For instance, can you concentrate closely enough to move with the group in the same way microscopic green algae, *Volvox*, moves? Can you rely on non-verbal communication to get teammates to form an aquatic food chain?

Clare Tallon Ruen, *LakeDance*, Chicago, IL

**Location:** 201 GLRC along windows

### **3. How Do Scientists Assess the Health of the Great Lakes?**

How do scientists assess the health of the Great Lakes? Join an environmental engineer as he demonstrates how to sample water from different water depths, collect plankton from the water column, sample the lake bottom sediments, and assess water clarity with a secchi disc.

Paul Pebler, M.S. student, MTU Dept of Civil & Environmental Engineering

**Location:** Agassiz Dock

### **4. Physics of Water**

Explore how water interacts with the world around it. Investigate how water interacts with light, magnets, electricity, and heat. Then delve into some of the properties that make water unique like surface tension, the unique way it freezes, and cloud formation.

Scott Rutterbush, Laboratory Associate, MTU Dept. of Physics

**Location:** B024 Fisher Hall basement

### **5. Remotely Operated Vehicles (ROVs)**

Find out how this high school student group designs their own remotely-operated vehicles and uses them to train Isle Royale National Park rangers to monitor underwater aquatic invasive species, especially the zebra mussel.

Dollar Bay High School SOAR ("Student Organization of Aquatic Robotics")

**Location:** GLRC Boathouse

### **6. The Clean Water Challenge: Engineers Without Borders Serving Less Developed Countries**

Find out how this student organization helps communities around the world to design and build systems to provide clean water that improves the quality of life by reducing illness.

Arick Davis (AM), Engineers Without Borders Student Chapter, MTU student, Dept. of Electrical Engineering  
Nicolette Slagle (PM), Engineers Without Borders Student Chapter, MTU student, Dept. of Civil & Env. Engin.

**Location:** Lower Level by Geowall

### **7. Wait...did you say the Keweenaw is ONE BILLION years old?!**

Solve the puzzle of the Keweenaw's ancient geologic past! In this session you can be a true rock detective by identifying and exploring the main rock types of the Keweenaw in order to learn what their stories tell about our fascinating past!

Hans Lechner (AM) and Erika Vye (PM), PhD candidates, MTU Dept of Geological Sciences & Mining Engin.  
Location: Keweenaw Boulder Garden on campus outside of the Dillman building

## **MORNING -ONLY Sessions**

### **8. Lake Superior Watershed Floor Map**

Ever think about how the Lake Superior watershed resembles a “bowl” or “basin”? We will create the watershed of Lake Superior in 3-D. Next, we’ll discuss some of the pollutants that enter Lake Superior and see if students can work together to do a “cooperative clean up.”

Marcy Erickson, Outreach Specialist, Western UP Center for Science & Environmental Outreach  
Location: B003 GLRC

### **9. How Do You Make A Lake Trout?**

Students will explore the role of the Lake Superior food web in providing the energy and mineral nutrition required to grow a Lake Trout. Hands on activities will include microscopic examination of the plankton, examination of the creatures who inhabit the lake bottom mud.

Dr. Marty Auer, MTU Dept of Civil & Environmental Engineering  
Location: 102 GLRC

### **10A. Stormwater & Low Impact Development (Session 1 & 2)**

What happens to bridges in heavy rainfall? Visit the MTU's first green roof. How do green roofs reduce runoff and help recharge groundwater?

Jennie Tyrrell, PhD student, MTU Department Civil Engineering-Water Resources  
Location: 110 Dillman Hall

### **10B. Sparkling Water & Emerging Contaminants (Session 3 & 4)**

Students will identify the variety of wastes that go down the drain and become “environmental engineers” and try to clean the wastewater. Would you drink this “cleaned” wastewater?!! They do in space and in Los Angeles!!

Jen Fuller, PhD student, MTU Dept. of Civil & Environmental Engineering  
Location: 320 Dillman

### **11. Invasive Species**

Students will learn about aquatic invasive pests in the Great Lakes, including how they got here, their negative impacts on Great Lakes fishing, and what is being done to prevent their spread. Live specimens will be shown.

Meral Jackson, Houghton-Keweenaw Conservation District  
Location: Hallway near 224 GLRC

### **12. GUPPIE & ROUGHIE: Autonomous Underwater Swimmers**

Meet two members of Michigan Tech's Nonlinear and Autonomous Systems Laboratory - GUPPIE (a Glider for Underwater Problem-solving and Promotion of Interest in Engineering) and ROUGHIE (a Research-Oriented Underwater Glider for Hands-on Investigative Engineering). If you have an interest in robotics, climate change, Great Lakes ecology, electronics and surveillance, or just curious about how scientists study life underneath the surface of Lake Superior - you will want to meet GUPPIE and ROUGHIE, and see these two platforms in action. Students will explore the physics behind the vehicles' locomotion and then try to design and deploy their own underwater vehicle.

Dr. Nina Mahmoudian, and students: Donna Fard, Byrel Mitchell, Brian Page, Eric Wilkening  
MTU Dept of Mechanical Engineering-Engineering Mechanics  
Location: 300 R. L. Smith (MEEM) Bldg – Mechanical Engineering-Engineering Mechanics Lab

### **13. Kite Aerial Photography Across the Keweenaw**

Ever wonder what the Keweenaw's vast water resources look like from a bird's eye view? Kite aerial photographer Nathan "Invincible" Miller will show you how he takes unique photos of our landscape and shares fun stories from his kite flying adventures.

Nathaniel Miller, Project Manager, Keweenaw Land Trust  
Location: 316 GLRC

### **14. Managing the Pack: Michigan's Gray Wolf**

Discover the tools and techniques the DNR uses to manage the gray wolf population. Put yourself in the role of wildlife biologist to see how different viewpoints of Michigan citizens affect management decisions.

Theresa Neal, Interpreter, Tahquamenon Falls State Park, Michigan Dept of Natural Resources  
Location: 202 GLRC

### **15. Hip Hop Poetry**

In small groups, students will write and perform their own poetry.

Jane Pallin, Community Volunteer, Secondary English Teacher  
Location: 314 EERC

### **16. Use of Native Plants by Indigenous Great Lakes Peoples**

In addition to giving us their intricate beauty, plants of the Great Lakes also give us supplies for shelter and clothing, nutritious foods to sustain us, and medicines to heal us. Become acquainted with 10 native plants growing in the Great Lakes region and how these plants can be used.

Karena Schmidt, Naturalist, MTU School of Forest Resources & Environmental Sciences  
Location: 1<sup>st</sup> floor next to 106 GLRC

### **17. Leave No Trace**

Students will engage in activities that illustrate some of the Leave No Trace principles ---plan ahead, travel and camp on durable surfaces, leave what you find, dispose of waste properly, respect wildlife, minimize campfire impacts and be considerate of other visitors.

Evan McDonald, Executive Director, Keweenaw Land Trust  
Location: 1<sup>st</sup> floor GLRC by windows

### **18. Protecting Water Quality through Land Stewardship & Conservation**

The Keweenaw Land Trust (KLT) is a community partner protecting land, water, and quality of life through conservation, stewardship and education. Find out how KLT applies effective strategies to protect and restore natural areas, watersheds, heritage lands, traditional farms, forests and family lands that enhance our quality of life and foster personal connections to the Keweenaw.

Pat Toczydlowski, Project Specialist, Keweenaw Land Trust  
Location: 104A Chemical Sciences Bldg.

### **19. What Floats Your Boat?**

Students will investigate the property of buoyancy. This will be done by building several different boats and using pennies to determine how much each of the boats can hold. After the boats are tested there should be a clear example of how the displacement of a boat effect how well it floats.

Andre Ringle, MTU student, Dept of Civil & Environmental Engineering  
Location: 104 GLRC

## **AFTERNOON-ONLY Sessions (Noon-2:50 PM)**

### **20. Sturgeon Ecology**

View live sturgeon and examine the sampling gear used in scientific research. Learn about sturgeon ecology--- food preferences, reproduction, life stages, and habitat requirements. We'll discuss the important role of sturgeon in Native American culture and the relative abundance of sturgeon across the five Great Lakes.

Sunflower Wilson, M.S. student, and Dr. Nancy Auer, MTU Department of Biological Sciences

Location: 111 GLRC, Fish Lab & space next to 1<sup>st</sup> floor Computing Lab

### **21. Invasive Species Alert!**

Invasive species are one of the biggest threats to our lakes. From sea lampreys to Zebra mussels, learn how to identify and prevent their spread.

Bob Wild, Chief Interpreter, Porcupine Mountains Wilderness State Park, Michigan Dept of Natural Resources.

Location: 202 GLRC

### **22. How Do You Make A Lake Trout?**

Students will explore the role of the Lake Superior food web in providing the energy and mineral nutrition required to grow a Lake Trout. Hands on activities will include microscopic examination of the plankton, examination of the creatures who inhabit the lake bottom mud.

Marcel Dijkstra, MTU Dept of Civil & Environmental Engineering

Location: 102 GLRC Limnology Lab

### **23. Secret Lives of Trees**

You might be surprised at all that's going on inside a tree that appears to not be doing anything. We'll make a tree out of people to learn how it works and look at the mystery of how water is moved to the leaves at the top of a tree without a pump. We hope to change the way you look at trees.

Steve Kickert, Environmental Education Coordinator, Ottawa National Forest

Location: GLRC – meet in the stairwell at bottom of stairs by lower level door

### **24. Aqueduct Action**

Your task is to design a system of aqueducts that will transport bouncy balls as far as possible. An aqueduct is a water supply or channel constructed to carry water.

Mind Trekkers (Courtney Rickard)

Location: 1<sup>st</sup> Floor window area

### **25. KBIC Sand Point Brown Field Remediation and Habitat Restoration Project**

The Keweenaw Bay Indian Community (KBIC) received a Great Lakes Restoration Initiative (GLRI) grant (\$360,960) to complete restoration of a 33.6 acre brownfield site on an area called Sand Point that protects coastal wetlands, located near Baraga, MI. Sand Point is culturally important for KBIC as it is the site of the Pow Wow grounds, a traditional healing clinic, wild rice beds, and campgrounds. Historically Sand Point was used by the native people for hundreds of years as indicated by the existence of ancient burial grounds. Sand Point today has great potential for additional recreational activities, yet its resources suffer from roughly six billion pounds of stamp sand being dumped into Lake Superior from 1901-1919 from the nearby Mass Mill.

Erin Johnston, Keweenaw Bay Indian Community Natural Resources Department

Location: 139 Fisher Hall

## **26. Natural Selection: A Simulation**

Natural selection is a fundamental concept of life sciences. Students will observe how populations change through natural selection by tracking changes in a population over time through a simple hands on simulation.

Tony Matthys, PhD student, MTU Dept of Civil & Environmental Engineering  
Location: 316 GLRC

## **27. Fishing & Boating**

Find out about Boater safety---how to properly get in and out of a boat—and fishing. We'll introduce how to choose the appropriate tackle and some casting techniques. Students will get to try casting off the dock.

MTU Fishing Club: Mike Sommers-President, Andrew Lobbbestael, Denzil Cotera, Jimmy Glombowski  
Location: GLRC docks

## **28. U.S. Coast Guard – Water Safety & Careers**

The local Coast Guard station in Dollar Bay is responsible for keeping boaters safe on Lake Superior and connecting waterways which includes performing rescues when needed---in all seasons and in all weather. Ask them what they like about their job and what it takes to become a “coastie.”

US Coast Guard officers  
Location: GLRC Docks

## **29. Exploring Great Lakes water levels with NOAA data online**

Use on-line data to investigate current and past lake levels in Lake Superior and other Great Lakes. Where are levels measured? How much does the water level change? What causes changes? Can we predict future water levels? Learn to use on-line data to explore these questions and any others you can think of.

Dr. Sarah Green, MTU Dept. of Chemistry  
Location: B003 GLRC

## **30. Is There Water on Zork?**

You're stranded on the planet Zork and you're thirsty. The Zorkians present you with several liquids. Which is water? Students use the scientific method to investigate the physical and chemical characteristics of water.

Jack Vaclavek, MTU student, Dept. of Chemistry  
Location: 104 GLRC

## **31. Keweenaw Images**

Find out what inspires this accomplished photographer. Get some tips on taking some great photos yourself!

Steve Brimm, photographer <http://www.stevebrimm.com/>  
Location: 320 Dillman