

## Shipboard and Shoreline Science Workshop Aboard the R/V *Lake Guardian*

The Center for Ocean Sciences Education Excellence (COSEE) Great Lakes invites 4th-10th grade teachers and non-formal educators to participate in its first annual Lake Guardian Shipboard and Shoreline Science workshop. This year's cruise on Lake Erie is designed to promote Great Lakes and ocean sciences in formal and informal education and forge lasting relationships between science researchers and educators. Participants will be involved in field exercises, work with scientists, examine curricula and resources, and explore classroom activities relating to the Great Lakes and ocean resources. **Fifteen teachers will be selected from around the Great Lakes basin.**

This one-week workshop takes place aboard the U.S. EPA's 180ft research vessel the R/V *Lake Guardian*. It will offer first hand explorations of Lake Erie geography, resources, processes and issues, and demonstrate how Great Lakes science parallels the science of the world ocean. Days are spent on the water cruising among the EPA water quality sampling stations and collecting plankton and benthic organisms. Participants will be involved in data collection and analysis, and in discussions of how the Lakes and oceans change with human activity, geographic location, geology, biology and weather. Evenings are spent at anchor in ports along the U.S. shore, with chances to visit special habitats and informal learning sites. Many teachable moments will occur as we encounter other vessels, observe waterfowl, and stop at shore facilities. This is Lake Erie learning at its best!

### Institute Objectives

#### **Our plan is for teachers to be able to:**

- Interact with scientists conducting research during the cruise; collect and analyze data en route
- Synthesize and provide examples of how water characteristics interact with land, life, weather, and human activities
- Demonstrate how to implement Great Lakes information into their existing curriculum or informal education media using traditional and/or electronic means
- Compare Great Lakes systems with ocean counterparts, with regard to issues of human impacts and natural changes over time

#### **We are prepared to:**

- Introduce teachers to regional Great Lakes and ocean science research topics and high quality curricular and educational resources;
- Provide an effective interface between teachers, Great Lakes and ocean science researchers;

- Promote inquiry learning through existing curricular and educational resources, aligning with National Science Education Standards;
- Facilitate the development, exchange and implementation of curricula and lessons for the participant's classroom;
- Provide for long term support, evaluation & communication between COSEE Great Lakes and workshop participants.

**As outcomes of the program, participants will be expected to**

1. Develop a reflective journal based on class activities
2. Develop a project utilizing electronic learning or curriculum development
3. Participate in research protocol development and implementation
4. Complete a plan for continuation of course ideas and scientist interaction
5. Participate in all aspects of program evaluation.

**Examples of topics** for the Great Lakes/ocean science program include:

- Coastal processes
- Dead Zones
- Wetlands
- Plankton and benthos
- Global climate change impacts
- Food chains and food webs
- Exotic and endangered species
- Shipping and recreation
- Storm systems
- AND the Great Lakes across the curriculum!

**Institute Team**

**Dr. Rosanne Fortner**, Director COSEE Great Lakes

**Anne Danielski**, PA Sea Grant Education and Maritime Specialist

**Helen Domske**, NY Sea Grant Education Specialist

**Dr. Beth Hinchey Malloy**, IL-IN Sea Grant, Purdue University

**Dr. Bill Edwards**, plankton dynamics, dissolved oxygen, invasive species

**Dr. Susan Boehme**, IL-IN Sea Grant, University of Illinois

...plus four additional scientists for portions of the trip

## Facilities

R/V Lake Guardian The R/V *Lake Guardian* is the U.S. Environmental Protection Agency's (EPA) largest research and monitoring vessel. It is the only self-contained, non-polluting research ship on the Great Lakes. The R/V *Lake Guardian*, operated by the EPA's Chicago-based Great Lakes National Program Office (GLNPO), conducts monitoring programs that sample the water, aquatic life, sediments, and air in order to assess the health of the Great Lakes ecosystem by using state-of-the-art data collection techniques and instruments during the biannual spring and summer surveys.

## Itinerary

The workshop will begin and end in Cleveland, Ohio, where the vessel will dock near the Great Lakes Science Center and the MV *Mather* that offer our program an excellent orientation and parking facilities. Each day will involve on-the-water exercises for learning about and sampling water quality, sediments and organisms, discussions with scientists and reading of their work, curriculum activities on the day's topics, and shore activities with other scientists. Nights will be spent in ports, with lectures, video programs or time to work on projects.

A detailed itinerary will be available soon. Ports for the workshop nights will be in Ohio: Cleveland, Put-in-Bay, Toledo, Huron, then Erie PA, and back to Cleveland.

## Participant Selection Criteria

Applications are invited from:

1. Teachers of grades 4-10 from the Great Lakes basin who teach or are willing to teach Great Lakes and marine science in their classrooms.
2. Educators from non-formal educational institutions that have Great Lakes or marine science exhibits or plan to add such topics to their programs.

All applicants must have a letter of reference from their principal or supervisor documenting the applicant's professional qualifications for the workshop and indicating that the administrator will support efforts to integrate Great Lakes/ocean science topics into the curriculum as these topics apply to state science standards.

Participants will be selected to provide regional geographic distribution and ethnic diversity. Teachers who are Native American or members of groups underrepresented in science and/or who teach significant numbers of students who are members of such groups are encouraged to apply.

## Application Procedures

All communications concerning the Institute and applications should be addressed to:

**Anne Danielski**

Pennsylvania Sea Grant  
301 Peninsula Dr. Suite #3  
Erie PA 16505

**Phone:** (814) 217-9019  
**Fax:** (814) 217-9021  
**E-mail:** add118@psu.edu

Completed application with required principal or supervisor signature must be received by April 7, 2006. Initial notification of participants and alternates will be made by email on April 20, 2006 and followed by a letter. In selecting individuals for participation and otherwise in the administration of this Institute, COSEE Great Lakes will not discriminate on the basis of race, gender, religion, national origin, age, disability, sexual orientation, or marital status. All selected applicants for the R/V *Lake Guardian* are required to view a "Safety Aboard the Lake Guardian" video available at <http://www.epa.gov/glnpo/monitoring/guard/safety/index.html> prior to participation.

## Graduate/ACT 48 Credits

Participants can earn graduate credits for workshop participation. **Each of these requires a separate application through the links noted. COSEE Great Lakes does not pay tuition, but stipends may be used for that purpose.** Credit is available through

- The Ohio State University [NAT RES 611: Great Lakes Education Workshop, through Stone Laboratory] <http://stonelab.osu.edu>
- Penn State University, Edinboro University, Gannon University, and Mercyhurst College will also make graduate credit available. Details are being finalized.
- Pennsylvania Participants may choose to earn Act 48 credits through the Regional Science Consortium (<http://www.regsciconsort.com/>).

## Participant Support

Workshop Participants will receive

1. Stipend of \$250
2. Housing and meals onboard the R/V Lake Guardian for six nights at no cost to the participant.
3. Travel support based on distance to workshop port of embarkation (Cleveland), not to exceed \$150 (some individual exceptions may apply).
4. Exemplary Great Lakes and marine curricula and resources
5. Long term support and communication between COSEE Great Lakes and the workshop participants.

## Housing

Participants will have room and board in the Crew's quarters of the vessel, 2 berths per room with small space for gear. Rooms include bunks, desks, lockers, and computer LAN connections. Private bathrooms with showers or bathrooms shared between two rooms are available. Recreation, exercise, and meal facilities aboard the Lake Guardian are excellent.