

INLAND SEAS EDUCATION ASSOCIATION

2009 EVALUATION REPORT

November 2009



Protecting the Great Lakes through Education

INLAND SEAS EDUCATION ASSOCIATION

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ACKNOWLEDGEMENTS

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We thank the many staff and board members and volunteers who have also provided valuable suggestions for improvements to the evaluation process.

The Inland Seas Education Association (ISEA) was formed in 1989 by sailors, educators, and scientists to promote the study and conservation of the Great Lakes. Our primary goal is to directly involve students with the Great Lakes so they will become good stewards of our natural resources in the future. ISEA is a non-profit, tax-exempt Michigan cooperation.

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INLAND SEAS EDUCATION ASSOCIATION
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I. EXECUTIVE SUMMARY

I. EXECUTIVE SUMMARY

Inland Seas Education Association (ISEA) was founded in 1989 as a private, non-profit organization. ISEA helps people of all ages experience the science and spirit of the Great Lakes through shipboard and on-shore educational programs.

The Mission of the Inland Seas Education Association is:

1. To inspire young people to pursue academic interests related to the Great Lakes, particularly the sciences, and
2. To provide enhanced public understanding and stewardship of the Great Lakes and global freshwater systems.

ISEA's educational programs have specific objectives designed to promote the mission of ISEA and reinforce some of the science and social studies objectives of the Michigan Grade Level and High School Content Expectations (formerly the Michigan Curriculum Framework Science Benchmarks). The surveys and tests used in ISEA's evaluation process are designed to measure how well the mission and learning objectives are being achieved.

Results of ISEA's evaluation process are used by educational staff to improve and enhance future educational activities. Teaching methods, educational materials, and volunteer training programs are refined each year to enrich the learning process for students of all ages participating in ISEA's educational programs. Modifications to the evaluation process itself are often made to increase the effectiveness of the process and the usefulness of the results.

This report includes statistical information about participation in ISEA's educational programs in 2009, summaries of teacher and students evaluations of the Schoolship Program, and summaries of participant surveys from a variety of ISEA's other educational programs. It also includes a summary of evaluations completed by ISEA's volunteer instructors about the Volunteer Instructor Training Program, the Schoolship Program, and programs in our Education Center.

PARTICIPATION IN ISEA'S EDUCATIONAL PROGRAMS IN 2009

ISEA provided shipboard experiential science learning opportunities for 3,930 people in 146 educational programs in 2009. The total number of shipboard participants to date in ISEA's Schoolship Program is **83,109**.

In addition to the participants of shipboard educational programs, 1,258 members of the public participated in shore-side educational tours of the schooner *Inland Seas* (in Charlevoix, Escanaba, Fayette, Suttons Bay, and Traverse City), and 182 people attended one of our Great Lakes Seminars in 2009.

The following table is a summary of the participation in ISEA's shipboard educational programs in 2009.

Participation in ISEA’s Shipboard Educational Programs in 2009

Types of ISEA Programs	Number of Programs	Number of Participants
Great Lakes Schoolship Programs		
Great Lakes Schoolship Program – Spring	84	2,420
Great Lakes Schoolship Program – Summer*	11	300
Great Lakes Schoolship Program – Fall	18	463
Family Science Sail*	17	405
Great Lakes Ecology Programs		
Michigan Trails*	1	28
Great Lakes Research Programs		
Young Women in Science	2	19
Invasive Species Research Program	2	18
Girl Scout Discovery	1	30
Great Lakes Specialty Programs		
Maritime History Sail	4	82
Underwater Exploration*	1	23
Astronomy Under Sail*	1	21
Michigan Schooner Festival Sail*	4	121
TOTAL	146	3,930

*Evaluations were not conducted due to the nature of the program.

SUMMARY OF PROGRAMS EVALUATED IN 2009

GREAT LAKES SCHOOLSHIP PROGRAMS (Spring and Fall)

The Schoolship Program is a half-day educational program offered to school groups during spring and fall. Spring Schoolship Programs are offered aboard ISEA’s schooner *Inland Seas* in Suttons Bay and the chartered schooner *Manitou* in Traverse City. Fall Schoolship Programs are offered aboard *Inland Seas*. A total of 102 Schoolship Programs offered in 2009 (spring and fall) included 52 schools from 41 districts or agencies. There were 25 schools that brought multiple classes. Thirty six schools (69% of all participating schools) returned from 2008.

Evaluation forms were distributed to all teachers and students participating in spring and fall Schoolship Programs in 2009. Students were evaluated using three unique tests based on student reading levels and subject matter complexity for elementary (level A; grades 4-6), middle (level B; grades 7-9), and high school (level C; grades 10-12) levels. Of the 102 Schoolship Programs offered during spring and fall 2009, there were 51 level A, 43 level B, and 5 level C programs. The remaining three classes had a combination of grade levels and, therefore, were not tested.

Teacher Evaluations

Following each Schoolship Program, teachers or group leaders were given a post-trip packet including a teacher evaluation. Evaluations were provided to 99 classes in spring and fall 2009, from which 37 teachers responded resulting in a 37% return rate. Ten of these teachers were

participating for the first time, fourteen teachers had participated for 1-5 years, and thirteen teachers had participated for more than 5 years.

Teachers felt the content level was appropriate for the program and that their students gained a great deal of new information and experience through each of the Schoolship learning stations. Of the 37 teachers that responded, 100% reported an increase in the interest of their students in studying science after their Schoolship experience, and 100% reported an increased student concern for the Great Lakes ecosystem.

Student Evaluations

Following each Schoolship Program, teachers were given a post-trip packet including student evaluations and an answer key. Teachers were asked to give their students the evaluation, grade it, and return it to ISEA for analysis. The following table summarizes the number of classes and students evaluated in 2009.

Student Participation in 2009 Evaluations

	# Classes Provided Evaluations	# Classes Returned Evaluations	# Students Evaluated
Level A (grades 4-6)	51	24	487
Level B (grades 7-9)	43	10	194
Level C (grades 10-12)	5	3	77
Total	99	37	758

Comparison of Student Evaluation Results from 2003-2009

In 2003, new evaluations were designed to more effectively determine what information students gained from the experience, as well as their thoughts on the Schoolship Program and the Great Lakes. This has allowed students of different levels to be evaluated more effectively. These evaluations are widely used by Schoolship teachers and their comprehensive nature allows teachers to reinforce concepts learned aboard the Schoolship back in the classroom.

The following is a comparison of the average scores students received on their evaluations from 2003-2009.

Average Student Evaluation Scores from 2003-2009

	Average Score						
	2003	2004	2005	2006	2007	2008	2009
Level A (grades 4-6)	90%	88%	88%	86%	91%	86%	90%
Level B (grades 7-9)	87%	83%	85%	86%	81%	84%	86%
Level C (grades 10-12)	85%	86%	92%	82%	81%	83%	87%

Average scores on level A evaluations fluctuated between 86-91% over the past seven years, with an average of 88%. Average scores on level B evaluations varied from 81-87%, with a seven year average of 85%. Level C average scores ranged from 81-92%, with a seven year average of 85%.

An analysis of student performance on each question of the Schoolship Student Evaluations was completed to identify areas of difficulty for students in different grade levels. The following table shows the topic area of each question that was missed by 30% or more of the students in 2009.

Frequently Missed Questions in 2009

Level A (grades 4-6)	Level B (grades 7-9)	Level C (grades 10-12)
	<i>Labeling:</i>	<i>Labeling:</i>
	Phytoplankton	Contaminants
		Decomposers
	<i>Multiple Choice:</i>	
	Food/Recyclers	

On the level A evaluation, there were no questions missed by more than 30% of the students. Students completing the level B evaluation often incorrectly labeled which organisms represent phytoplankton (65% correct) and had difficulty identifying benthic organisms as food for fish and recyclers of the lake (57% correct). On the level C evaluation, students had difficulty labeling which organisms had the highest level of contaminants in their tissues (62% correct) and which organisms act as recyclers or decomposers of the lake (49% correct). This analysis describes key areas of difficulty that are addressed in the 2010 Action Plan (see page 40).

GREAT LAKES RESEARCH PROGRAMS

Young Women in Science

Zonta International sponsored two overnight Young Women in Science Programs in Grand Traverse Bay and Escanaba during the summer of 2009. A total of 18 students participated in these programs. Students were evaluated based on the content they learned and how well they thought the program was executed. The program had four content-based objectives: gain content knowledge about invasive species in the Great Lakes, learn and practice sampling techniques, complete and present a research project, and promote a sense of stewardship. Students were asked to rank each objective (on a scale of 1 to 5) based on their content knowledge before and after the program. Before the program, the average score was 2.28 (45% understood the content), while after the program the average score was 4.36 (87% understood to content). Ninety-eight percent (98%) of the students felt the program was well organized and exciting, the instructor and crew were knowledgeable and helpful, and would recommend the experience to others. The students commented that they really enjoyed the experience and learned a lot about the Great Lakes.

Invasive Species Research Program

Seventeen high school students participated in two overnight Invasive Species Research Programs during the summer of 2009. These students learned about aquatic invasive species in the Great Lakes and sampled for invasive species in Grand Traverse Bay. Students were evaluated based on the content they learned and how well they thought the program was executed. The program had four content-based objectives: gain content knowledge about invasive species in the Great Lakes, learn and practice sampling techniques, complete and present a research project, and promote a sense of stewardship. Students were asked to rank each

objective (on a scale of 1 to 5) based on their content knowledge before and after the program. Before the program, the average score was 2.39 (47% understood the content), while after the program the average score was 4.43 (88% understood the content). Ninety-five percent (95%) of the students felt the program was well organized and exciting, the instructor and crew was knowledgeable and helpful, and would recommend the experience to others. The students commented that the program was great and they would not change a thing.

Girl Scout Destinations

A three-day Girl Scout Discovery Program was offered in August 2009 for pre-teen and teenage Girl Scouts from around the world. A total of 27 students participated in this program. Students were evaluated based on the content they learned and how well they thought the program was executed. The program had four content-based objectives: gain content knowledge about invasive species in the Great Lakes, learn and practice sampling techniques, complete and present a research project, and promote a sense of stewardship. Students were asked to rank each objective (on a scale of 1 to 5) based on their content knowledge before and after the program. Before the program, the average score was 2.50 (50% understood the content), while after the program the average score was 4.67 (93% understood the content). Ninety-three percent (93%) of the students felt the program was well organized and exciting, the instructor and crew were knowledgeable and helpful, and would recommend the experience to others. The students commented that the program was really fun and easy to follow.

SPECIALTY PROGRAMS

Maritime History of Suttons Bay

A Maritime History Sail in Suttons Bay was offered in July 2009. Participants sailed aboard the schooner *Inland Seas* guided by the ship's crew and local historians Laura Quackenbush and Claudia Goudschaal. Of the 15 people that participated in the program, 6 filled out an evaluation. Participants felt that the program was great and there was little room for improvement. They enjoyed the entire program and commented that the information was casual, but clear.

ISEA VOLUNTEER INSTRUCTORS

Volunteer Instructor Training

Each year ISEA volunteers (both new and veteran) participate in a series of training classes from January through April designed to prepare them to become volunteer instructors aboard the Schoolship and in the Education Center. Volunteer instructors evaluated each training session based on the clarity of the presentation, the pace of the presentation, the quality of the visuals used, the clarity of written materials, the effectiveness of the small group station, and the amount of material presented. Ninety-seven percent (97%) of the topic areas resulted in a rank of "good" or "great," and 95% felt the amount of material presented was "just right." Most comments pertained to the good quality of the presentations and the usefulness of the break-out sessions.

Volunteer Instructor Year-End Survey

A Volunteer Instructor Year-End Survey was sent to all 111 volunteers that taught aboard the Schoolship or in the Education Center during 2009. Of the 25 volunteers that responded, 99% rated the overall organization of the program and interactions with the Education Director, lead instructors, instructors, and sailing crew as "good" or "excellent." All volunteers said the overall organization of the program and the student's experience was "good" or "excellent." Ninety-four

percent (94%) of the volunteers felt the volunteer instructor training class helped prepare them for teaching aboard the Schoolship, and many volunteers provided helpful comments and shared meaningful stories.

212 volunteers contributed a total of 9,705 hours to the operation of ISEA in 2009. Volunteer instructors aboard *Inland Seas* and *Manitou* donated 4,903 of the total volunteer hours. A total of 121 volunteer instructors taught aboard the schooners – 102 were veteran instructors and 19 were new instructors in 2009. In addition to hours donated by volunteers aboard the Schoolship, 2,176 hours were devoted to educational programs and other projects that took place in the Education Center. A total of 106 volunteers donated 214 hours to Education Center programs, 1,338 hours to the Boat Shop, and 625 hours to other projects (office work, events, curriculum development, etc.).

The highest number of hours donated by one volunteer in 2009 was 717. The average number of hours per volunteer was 46. Based on an average hourly value for volunteer time in the U.S. from the Independent Sector (\$20.25), volunteers provided ISEA with time and services worth over \$196,526. ISEA is extremely fortunate to have such a strong group of supportive volunteers. We simply could not do what we do at ISEA without this incredible group of people. The diverse background and enthusiasm volunteers bring to ISEA's educational programs each year is priceless.

2010 ACTION PLAN

In 2010, evaluation materials will again be distributed to all teachers and students participating in the Schoolship Program. Several questions on the 2010 student evaluations have been updated to better reflect subject matter complexity and reading levels for each grade. The major areas of concern were identifying benthos as recyclers of organic material, labeling phytoplankton on a food web, and identifying which organisms in a food web had the highest level of contaminants and which were decomposers. The food web diagram and corresponding questions have been updated in the 2010 student evaluations. These areas of concern will be emphasized in the Volunteer Instructor Training Program.

In addition to these specific modifications, efforts will be made to improve the quality of instruction and effectiveness of the evaluation tools for all of ISEA's educational programs. ISEA is dedicated to continue this process of revisions and improvements in years to come.

II. GREAT LAKES SCHOLSHIP PROGRAMS

II. GREAT LAKES SCHOOLSHIP PROGRAMS

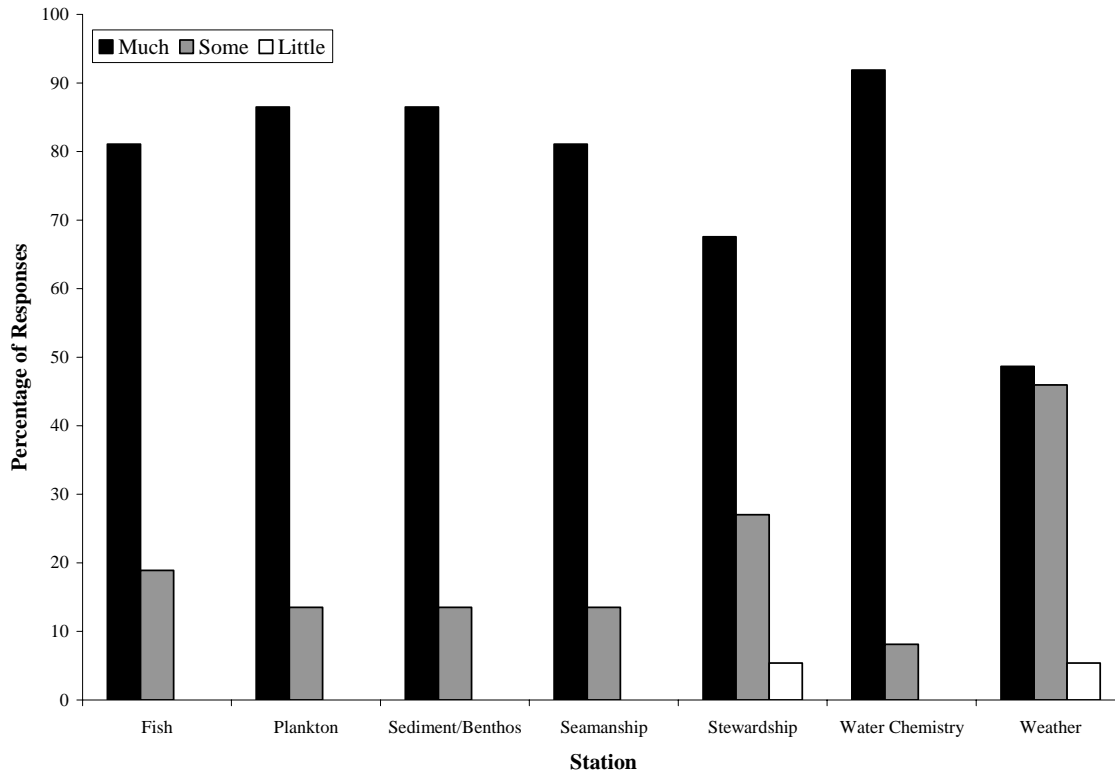
A. TEACHER EVALUATIONS

37 Teacher Responses

- 1. Was this your first trip with ISEA?** Yes (29%) No (71%)
If not, how many times have you sailed with us?
 Twice (26%) Five times (7%) Nine times (4%)
 Three times (15%) Seven times (11%) Ten times or more (33%)
 Four times (4%)

- 2. How did you hear about the Schoolship Program?**
 Another school (4%) Media (4%)
 Brochure (4%) Parent (4%)
 Colleague (18%) Previous trip (11%)
 Family member (4%) School tradition (26%)
 ISEA staff/member/volunteer (11%) Word of Mouth (11%)
 Lake Association (4%)

- 3. Was the content level appropriate for this program? Please rate the amount of new information and experience your students gained at each station.**



4. Do you have any suggestions on how we could improve our stations?

Example Comments:

- Maybe a bit more hands-on at the stewardship station.
- I like the new addition this year to the stations. Well-planned activities, which met district and state standards.
- We seemed to be a bit rushed at times. There was a lot of information in a short period of time.
- It would be easier if each station used the booklet in the same way. Let the students know when its time to use them, so they didn't have to ask.
- Students wanted to sing sea shanties as you bring in the line and allow student to examine the fish more closely.

5. Please rate your perception of your students' attitudes following their Schoolship experience.

a. Did you notice an increased interest in science?

No Change (0) Some Positive Change (57%) Great Positive Change (43%)

b. Did you notice an increased concern for the Great Lakes ecosystem?

No Change (0) Some Positive Change (54%) Great Positive Change (46%)

Example Comments:

- It was an incredible hands-on interactive classroom with sails. The excitement and engagement cannot be measured.
- Students were very concerned about our water, the area we live in and how they could help.
- They were surprised by the number of invasive species even though we had studied about that in the past.
- There's more of an appreciation for preserving the ecosystem.
- My students have a greater respect for our bay and the Great Lakes. They also have a greater understanding of how everything is related.

6. Can you relate any specific examples of how the Schoolship experience affected one or more of your students?

Example Comments:

- We had many comments from students about how much they loved the trip. Even though we live close by, many students had never been on Lake Michigan. Also, several students connected their learning to reading class and Treasure Island.
- "I never knew how everything was so connected" from one student. Students also expressed a need for action to be more active in understanding our Great Lakes.
- Student stated: "I now know plankton is a plant and an animal."
- One student was so afraid to board that they almost allowed her to not attend. But this was a class grade, so she did board. After I asked if she would do this again. She said "Yes!" with a huge smile on her face.
- Yes, some realized how important it is to keep invasive species out of our lakes, conserve water, etc. All kids loved it!

7. Please check any of the following activities from the Schoolship Teacher’s Guide that you have used or plan to use.

- | | |
|--|---|
| A Watershed View of the Bay (35%) | Journey to the Sea (14%) |
| Acids and Bases (35%) | Lake Stratification (27%) |
| Building Your Own Watershed (11%) | Sea Shanties and the Schoolship (14%) |
| Calculating Cloud Cover (38%) | Shoe Key (8%) |
| Fathoms Below the Schoolship (11%) | Teaching Vocabulary (70%) |
| Great Lakes Food Web (68%) | Understanding Global Water Distribution (70%) |
| Great Lakes Stewardship Challenge (27%) | Understanding Water in Your Own Region (32%) |
| Great Lakes Stewardship: Post-Schoolship Community Involvement (14%) | Why Do Boats Float? (30%) |
| Gyotaku (Japanese Fish Painting) (0) | |
| Invader Species of the Great Lakes (68%) | |

8. If you used one or more of the activities from the Schoolship Teacher’s Guide, how successful were the activities? Did you modify the activities for your students? Can you suggest improvements?

Example Comments:

- There are activities that will directly tie into our TCAPS science curriculum for 5th grade, so we will definitely benefit from them!
- Teaching vocabulary and stewardship challenge were excellent beginnings before our trip, a lot of discussion from conversations at home. Once these were shared at home by the students, the student discussion became more enriching with application of knowledge. I noticed this even more so after the trip.
- The lessons that I used were very well done. My biggest challenge was the amount of activities. It was difficult to decide which to do. Maybe you could rank them in order of importance.
- I did the Invader Species than had the students choose from a list of Great Lakes invaders and do a small poster about that invader. The poster included a picture along with similar information as the cards.
- I felt the activities I used were successful – with some modifications. The students looked forward to the lessons.

9. ISEA now uses Schoolship Student Evaluations with unique evaluation forms for students of different grade levels. We would appreciate your feedback on these evaluations.

Did your students complete the Schoolship Student Evaluations? Yes (88%) No (12%)

Did you correct the evaluations and discuss the results? Yes (85%) No (15%)

Did your students encounter any problems with the evaluations? Yes (0) No (100%)

If so, could you share their concerns with the ISEA staff?

Example Comments:

- Some did, but that is common. Some kids chose not to go and I had them take it as well.
- This trip was the last few days of school so I was not able to give the survey to students.
- I have them write a full-page essay instead of just a few lines.

Additional comments regarding the Schoolship Student Evaluations:

Example Comments:

- The students enjoyed filling them out and “reliving” the day through discussion.
- Thanks for seeking our feedback! The students learned a great deal and had a wonderful experience aboard the Inland Seas Schoolship!
- I think it is a great idea to discuss and review what we saw on the ship.
- So valuable – Thank you!

10. Many of our prospective clients wonder how schools finance their trip(s). Would you share how your trip was funded?

Donations (6%)	Lake Association (3%)	PTA (12%)
Grant (9%)	Local funds (6%)	Rotary (12%)
ISEA scholarship (6%)	Parent donation (3%)	School fundraiser (42%)

B. STUDENT EVALUATIONS – LEVEL A (grades 4-6)

487 Student Responses

Instructions: Now that you have sailed with us on the Schoolship, please help us see what you have learned! Choose the best word from the word list below to complete each sentence.

Food Web	Water Clarity	Forage Fish	Benthos
Exotic Species	Plankton	pH	Schooner
Watershed	Dissolved Oxygen		

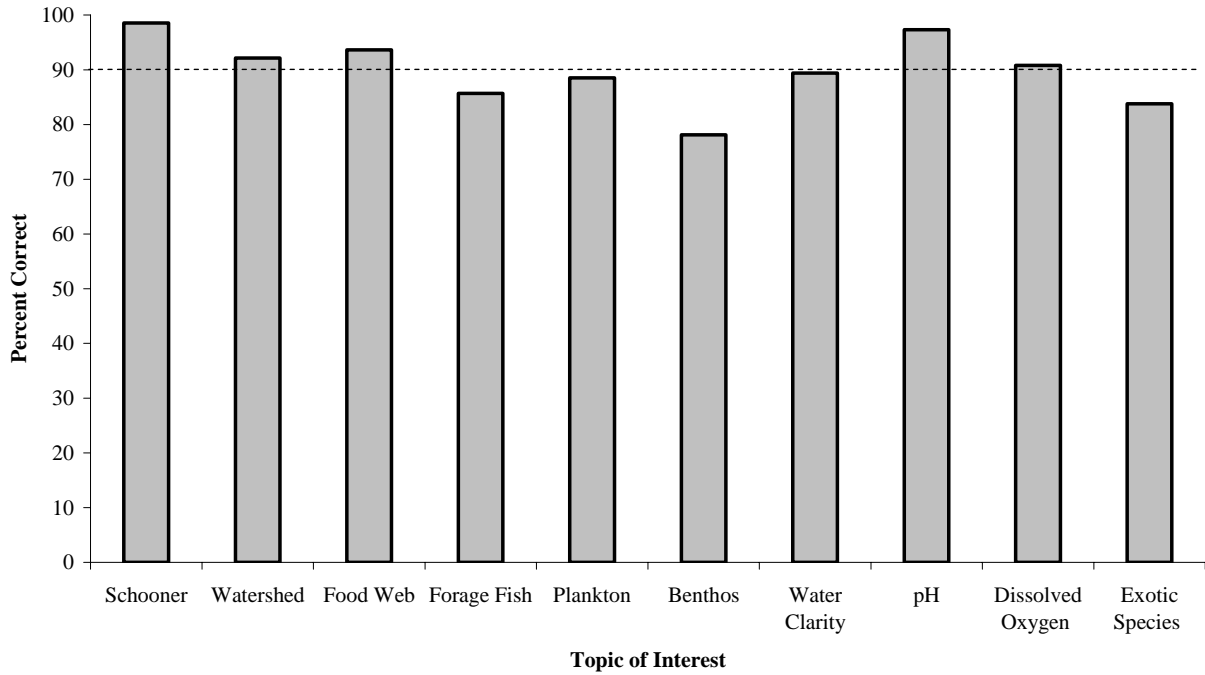
- 1. The Schoolship is a special type of sailing ship called a schooner. (99%)**
- 2. The land that water flows across or under on its way to a stream, river, or lake is called a watershed. (92%)**
- 3. A food web describes the feeding relationships among organisms in the lake (who eats whom). (94%)**
- 4. A net called an otter trawl is used to catch forage fish, which are eaten by larger fish in the lake. (86%)**
- 5. Plankton are tiny plants and animals that float freely in the water and are a very important part of the food web. (89%)**
- 6. Benthos is a special name for organisms that live on the bottom of the lake. (78%)**
- 7. The black and white Secchi disk is used to measure water clarity. (89%)**
- 8. Acid rain and other types of pollution can affect the pH of the water, which should be in the neutral range of 6-9. (97%)**
- 9. Dissolved oxygen in the lake comes from the air and from plants in the water. (91%)**
- 10. Some exotic species have come to the Great Lakes in the ballast water of ships from Europe. (84%)**
- 11. Tell us about the most interesting thing you learned on the Schoolship!**

Example Comments:

- I loved everything I did on the Schoolship.
- I thought the pH was the most interesting thing on the Schoolship. I thought it was interesting because I had never heard of it. Also because I didn't know water was acidic.
- I really enjoyed learning about plankton. The red worm-things really amazed me when I saw them under the microscope. I never knew how many different plankton species there are in the Great Lakes. I hope by the time I come back maybe you will have discovered a new species of plankton.
- The most interesting thing I learned on the Schoolship was that a watershed was the land that water flows across.
- The most interesting thing that I learned was how to do all the different stations and pull the anchor out. I learned about plankton, watersheds, dissolved oxygen, benthos, pH, water clarity, food webs, and how to steer the boat. I learned a lot of great things on the schooner! Thanks for having me!

Below is a summary of the Student Evaluation results for questions 1-10. The dashed line represents the average score (90%).

**Spring & Fall 2009
Overall Analysis of Student Evaluation A (Grade Level 4-6)
487 Student Responses**



STUDENT EVALUATIONS – LEVEL B (grades 7-9)

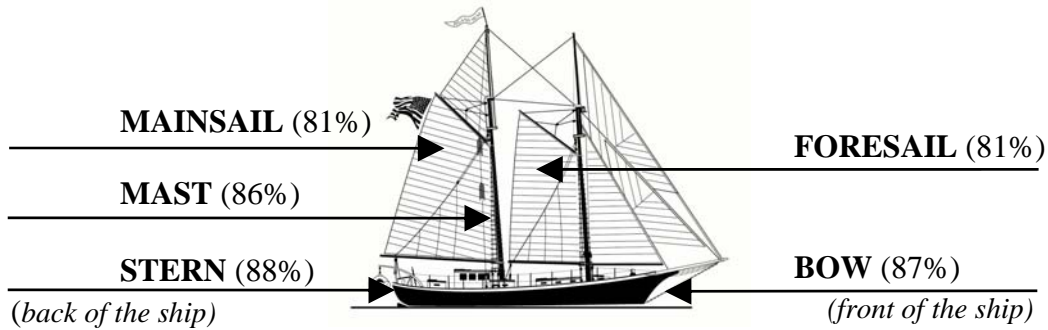
194 Student Responses

A. LABELING DIAGRAMS

1. Label the drawing of the Schoolship below by entering the following names on the arrows provided:

**MAST
MAINSAIL
FORESAIL**

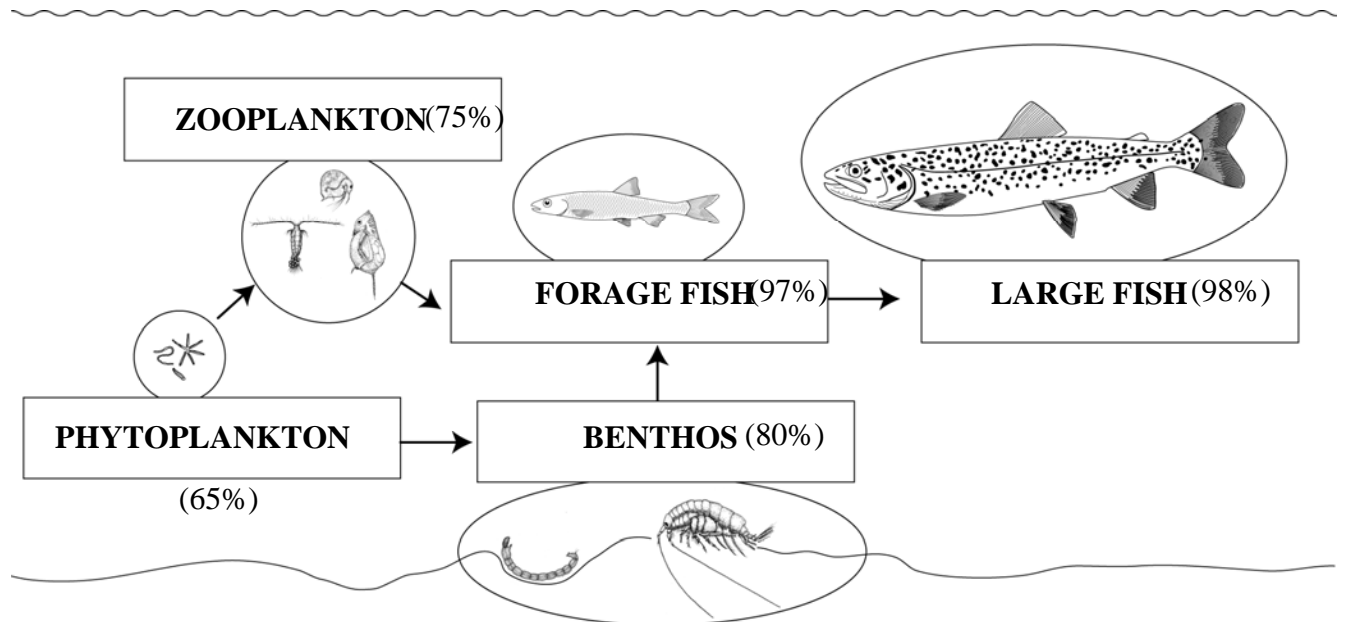
**BOW
STERN**



2. On the food web diagram below, label the groups of organisms by entering the following names in the boxes provided:

**PHYTOPLANKTON
ZOOPLANKTON
BENTHOS**

**FORAGE FISH
LARGE FISH**



B. MATCHING

Match the definition in the left column with the word(s) in the right column. Place the letter of the best answer in the blank provided (use each letter once).

- | | | |
|----------------|--|--|
| b (98%) | 1. Term that describes the feeding relationships among organisms in the lake (who eats whom) | a. Wind direction |
| f (89%) | 2. Equipment used by scientists to collect samples | b. Food web |
| d (90%) | 3. Plant plankton | c. Benthos |
| g (88%) | 4. Animal plankton | d. Phytoplankton |
| c (86%) | 5. Organisms that live on the bottom of the lake | e. Exotic species |
| j (87%) | 6. Tool used by scientists to identify fish | f. Ponar dredge, plankton net, otter trawl, and Van Dorn bottle |
| i (91%) | 7. Threats to the fish population | g. Zooplankton |
| e (87%) | 8. Organisms that have come to the Great Lakes in the ballast water of ships from Europe | h. Watershed |
| a (96%) | 9. Influences what course can be sailed | i. Pollution, overfishing, exotic species and destruction of habitat |
| h (92%) | 10. Area of land that drains into a common body of water | j. Key |

C. MULTIPLE CHOICE

Circle the best answer for each question below.

- 1. The Schoolship is a special type of sailing ship called a _____.**
 - (a) canoe.
 - (b) skiff.
 - (c) **schooner.** (97%)
- 2. Even though the Schoolship is made of heavy steel, it floats. This is because of:**
 - (a) sail lift.
 - (b) wave action.
 - (c) **displacement and the shape of the ship.** (90%)
- 3. The wheel of the ship turns the _____, which turns the ship.**
 - (a) sail
 - (b) **rudder** (95%)
 - (c) mast
- 4. Weather information is used on the ship to:**
 - (a) describe the conditions that existed when samples were collected.
 - (b) predict weather to help the captain decide if and where to sail.
 - (c) **both of the above.** (75%)

5. **Twenty percent of the world's available fresh water is in:**
 (a) **the Great Lakes.** (95%)
 (b) the Atlantic Ocean.
 (c) Lake Michigan.
6. **Acid rain can affect the _____ of the water, which should be in the neutral range of 6-9.**
 (a) dissolved oxygen
 (b) **pH** (79%)
 (c) clarity
7. **Dissolved oxygen in the water comes from:**
 (a) **plants and the atmosphere.** (79%)
 (b) benthos.
 (c) fish.
8. **One important difference between the deep water habitat (Ponar dredge sample) and the shallow water habitat (otter trawl sample) is:**
 (a) the deep water has less pollution than the shallow water.
 (b) **the deep water has less sunlight than the shallow water.** (78%)
 (c) the deep water has less plankton than the shallow water.
9. **Benthic organisms are:**
 (a) **food for fish and recyclers of the lake.** (57%)
 (b) visible only under the microscope.
 (c) collected with a plankton net.
10. **Plankton must be identified with a microscope because they are so:**
 (a) sensitive to light.
 (b) numerous.
 (c) **small.** (97%)

D. YOUR EXPERIENCE

1. My trip on the Schoolship helped me appreciate:

Example Comments:

- The environmental around me and the people who live here.
- The trip made me think about and appreciate the Great Lakes even more, and that we hold 20% of the world's fresh water and we NEED to take care of it...it is our responsibility.

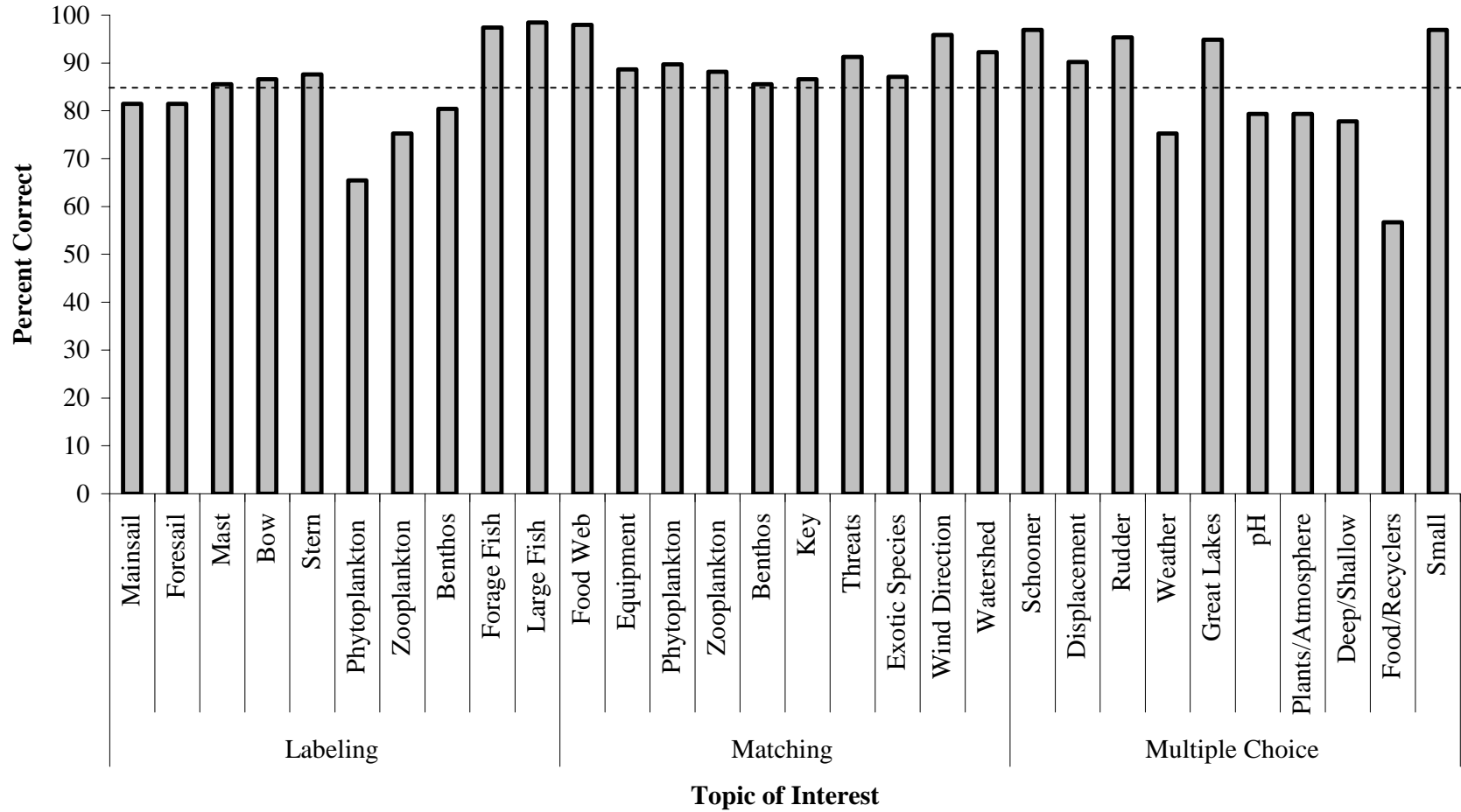
2. What could YOU do to become a better steward and help protect the Great Lakes:

Example Comments:

- Don't pollute, don't waste water, don't use harmful chemicals that could end up in there.
- Empty bilge, clean off boat before going to another lake or river. Don't transfer fish to another place. Don't throw things in the water that don't belong in the water.
- Turn off the water when I brush my teeth, inform people about what their doing to the Great Lakes ecosystem, and pick up my garbage off the beach when I leave.

On the following page is a summary of the Student Evaluation Level B results for the labeling, matching, and multiple choice questions. The dashed line represents the average score (86%).

Spring & Fall 2009
Overall Analysis of Student Evaluation B (Grade Level 7-9)
194 Student Responses



STUDENT EVALUATIONS – LEVEL C (grades 10-12)

77 Student Responses

A. LABELING

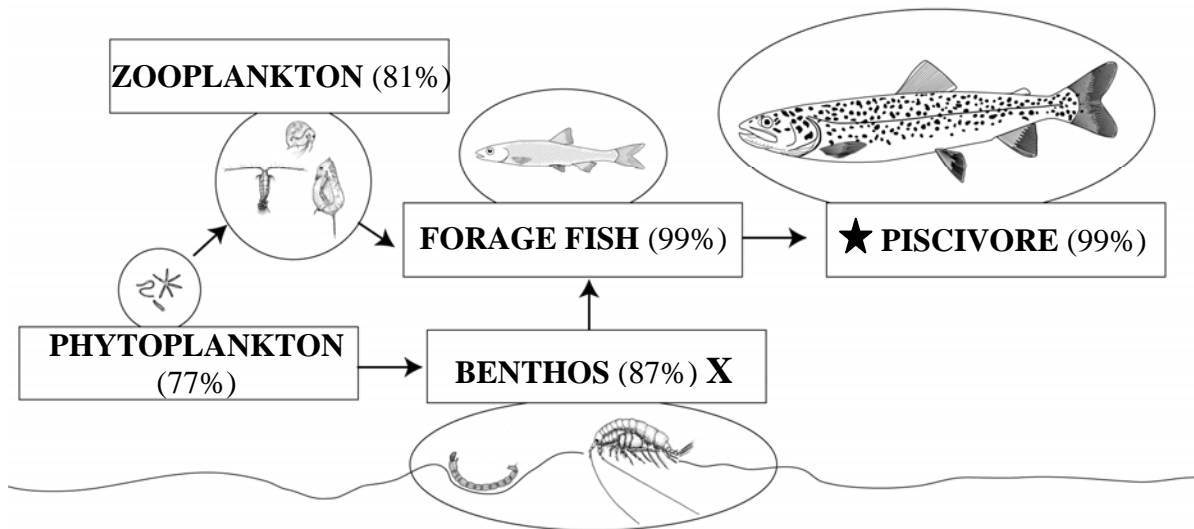
On the food web diagram below:

- (a) Label the groups of organisms by entering the following names in the boxes provided:

PHYTOPLANKTON
ZOOPLANKTON
BENTHOS

FORAGE FISH (feeds on plankton or benthos)
PISCIVORE (fish that feeds on smaller fish)

- (b) Draw a star (★) beside the type of organism that you would expect to have the highest concentration of contaminants in its tissues. (62%)
- (c) Place an X beside the organisms that act as recyclers or decomposers in the lake. (49%)



B. MULTIPLE CHOICE

Circle the best answer for each question below.

- Twenty percent of the world's available fresh water is in:
 - the Great Lakes. (95%)
 - the Atlantic Ocean.
 - Lake Michigan.
 - glaciers.
- Acid rain and other types of pollution can affect the pH of the water, which should be in the range of _____ for fish and other aquatic organisms to live.
 - 1-4
 - 3-5
 - 6-9 (91%)
 - 10-12

3. What geological condition in the Great Lakes helps keep our water within this preferred pH range?
- (a) sandy beaches
 - (b) high moraines
 - (c) **limestone bedrock** (99%)
 - (d) ancient mountains
4. Dissolved oxygen in the water comes from:
- (a) **plants and the atmosphere.** (71%)
 - (b) zooplankton.
 - (c) fish and other aquatic animals.
 - (d) limestone bedrock.
5. One important difference between the deep water habitat (Ponar dredge sample) and the shallow water habitat (otter trawl sample) is:
- (a) the deep water has less pollution than the shallow water.
 - (b) **the deep water has less sunlight than the shallow water.** (87%)
 - (c) the deep water has fewer plankton than the shallow water.
 - (d) The deep water has a lower pH than the shallow water.
6. In the **middle of summer**, the surface water temperature is generally _____ the bottom water temperature.
- (a) **warmer than** (82%)
 - (b) colder than
 - (c) the same temperature as
 - (d) none of the above
7. Plankton are:
- (a) invertebrates that live in the bottom sediments
 - (b) rooted plants that grow near the shore
 - (c) small fish that are eaten by trout and salmon
 - (d) **microscopic plants and animals that float freely in the water** (96%)
8. How do exotic zebra mussels affect the Great Lakes ecosystem?
- (a) they attach to native freshwater mussels
 - (b) they increase water clarity
 - (c) they compete for food with organisms like amphipods and native freshwater mussels
 - (d) **all of the above** (87%)
9. Which of the following is NOT an exotic species in the Great Lakes Region?
- (a) round goby
 - (b) **walleye** (82%)
 - (c) zebra mussel
 - (d) sea lamprey
10. The feeding relationships among aquatic organisms are **best** described as a:
- (a) food group.
 - (b) **food web.** (71%)
 - (c) food chain.
 - (d) chain gang.

11. Which of the following is a threat to the fish population in the Great Lakes?

- (a) pollution and loss of habitat
- (b) over-fishing
- (c) exotic species
- (d) all of the above** (99%)

12. On the schooner, the wheel turns the _____, which turns the ship.

- (a) sail
- (b) spar
- (c) rudder** (94%)
- (d) mast

13. The accumulation of contaminants in the tissues of organisms is called:

- (a) hydrophobia
- (b) bioaccumulation** (90%)
- (c) consumerism
- (d) sublimation

14. The responsibility to protect and preserve the Great Lakes for future generations is called:

- (a) preparedness.
- (b) stewardship.** (86%)
- (c) friendship.
- (d) responsiveness.

15. The ability of a boat to float is called:

- (a) buoyancy.** (94%)
- (b) mass.
- (c) dislocation.
- (d) drifting.

C. MATCHING

Match the definition in the left column with the sampling equipment in the right column. Place the letter of the best answer in the blank provided (use each letter once).

- | | |
|--|--------------------|
| b (97%) 1. Used to measure water clarity | a. Ponar dredge |
| d (94%) 2. Used to collect a water sample from deep in the lake | b. Secchi disk |
| e (97%) 3. Used to strain microscopic plants and animals out of the water | c. Otter trawl |
| a (91%) 4. Used to collect sediment from the bottom of the lake | d. Van Dorn bottle |
| c (96%) 5. Used to collect forage fish | e. Plankton net |

D. YOUR EXPERIENCE

1. After your trip on the Schoolship, how would you describe the water quality in Grand Traverse Bay and the general health of this ecosystem, and why?

Example Comments:

- I believe that the general health of Grand Traverse Bay and its ecosystem to be pretty good and getting better. The water use to be worse than what it is now. It's becoming less polluted but it's also getting clearer, which isn't always good.
- After our trip on the Schoolship I would decide the water quality in Grand Traverse Bay and general health of the ecosystem to be healthy. This is after learning and observing the pH, temperature, oxygen levels, clarity, etc.
- The water quality in Grand Traverse Bay was good. The water was clear, dissolved oxygen and pH were where they needed to be. The ecosystem seemed to be as well. We caught many native species.
- The quality of the water was great. The pH level was good enough for the fish and the oxygen levels in the water were really good. The ecosystem was off balance because of the invasive species like the round goby, sea lamprey, and zebra mussel.
- I would say that overall it is pretty good except for the fact that it is too clear. This is bad because it means that there is not enough plankton in the water which makes it hard for fish to survive.

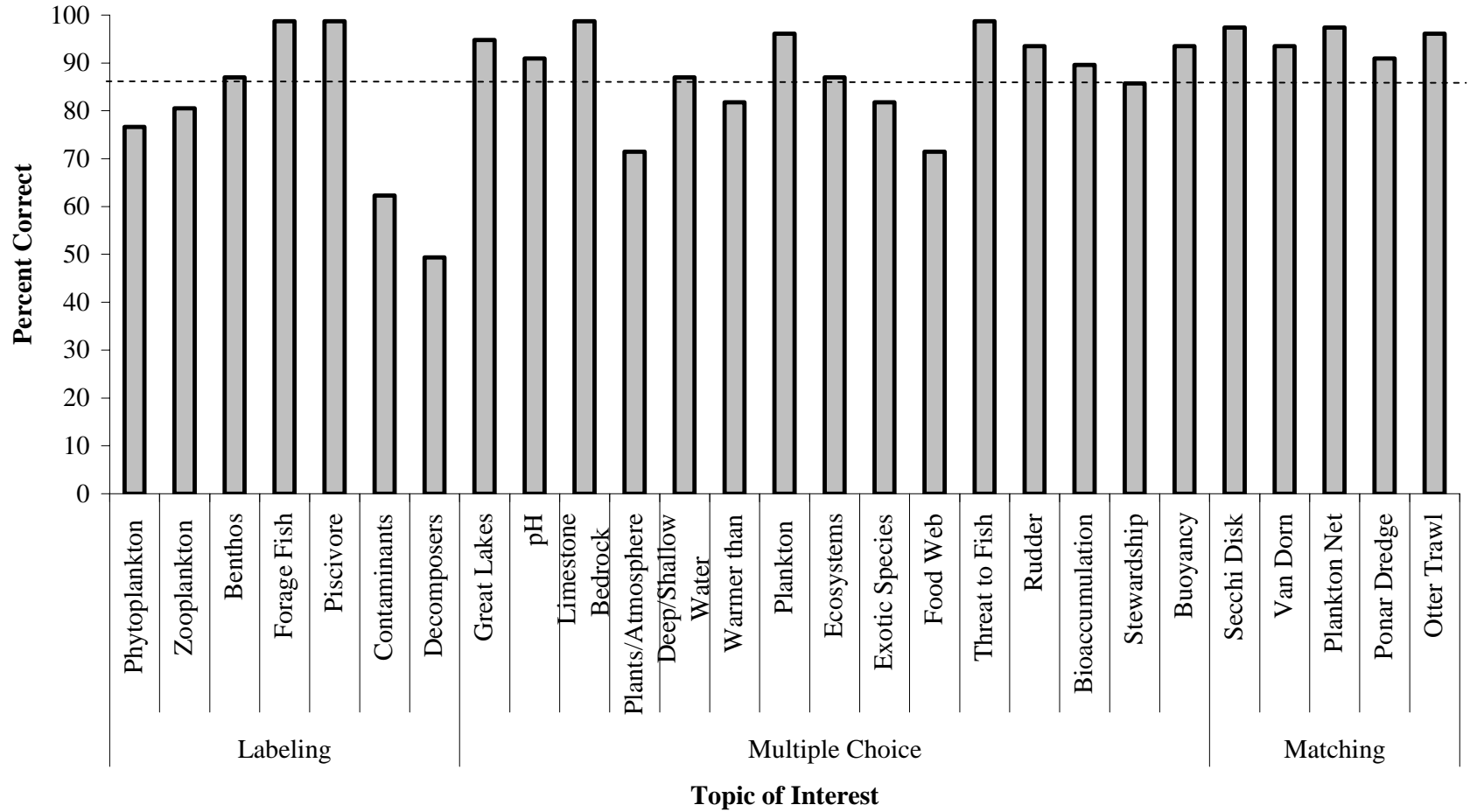
2. What could YOU do to become better stewards and help protect the Great Lakes? Respond in terms of water quality, habitat, species diversity, exotic species, pollution, education, etc.

Example Comments:

- I could help to decrease pollution in the Great Lakes and teach others to do this as well. Also, I could help to educate people about species in the Great lakes and their importance there.
- I would tell people what it would do in the future if we littered in the lake. I would put recycling bins by the lake.
- To become better stewards in the Great Lakes we need to stop polluting them. We shouldn't even dump the rest of our soda, it raises the pH. We need to empty out boats on land so as not to spread exotic species. We just need to become more educated on the whole subject.
- To become a better steward I can use less water in my everyday life: shorter showers, shut off water while brushing teeth.
- The reason the water is so clear is the invasive mussels. When we transfer our boats from place to place we should be sure to clean off the bottom to prevent the mussels from going to one inland lake to another.

On the following page is a summary of the Student Evaluation Level C results for the labeling, multiple choice, and matching questions. The dashed line represents the average score (87%).

Spring & Fall 2009
Overall Analysis of Student Evaluation C (Grade Level 10-12)
77 Student Responses



III. GREAT LAKES RESEARCH PROGRAMS

Objective 3: To help design, complete, summarize, & present an independent research project.

Score	Pre-program		Post-program	
	# Participants	% Participants	# Participants	% Participants
1	0	0	0	0
2	3	16.7%	0	0
3	8	44.4%	1	5.6%
4	6	33.3%	10	55.5%
5	1	5.6%	7	38.9%

Average Score:

Pre-test = 3.28 Post-test = 4.33 Difference = 1.05*

* Indicates a statistically significant change ($p < 0.001$)

Objective 4: To promote a sense of stewardship towards the Great Lakes watershed.

Score	Pre-program		Post-program	
	# Participants	% Participants	# Participants	% Participants
1	6	33.3%	0	0
2	5	27.8%	0	0
3	5	27.8%	3	16.7%
4	1	5.6%	7	38.9%
5	1	5.6%	8	44.4%

Average Score:

Pre-test = 2.22 Post-test = 4.28 Difference = 2.06*

* Indicates a statistically significant change ($p < 0.001$)

Reaction to the program

To what extent do you agree with the following statements? Please circle the number that represents your feedback. Numbers range from 1 (not at all) to 5 (a great deal).

	Not at All		Somewhat		A Great Deal
The Education Director instructed in a clear & concise manner.	0	0	0	27.8%	72.2%
The instructors & crew answered questions completely & knowledgeably.	0	0	0	11.1%	88.9%
The program was exciting & held my interest.	0	0	5.6%	33.3%	61.1%
The program materials were complete & useful.	0	0	0	33.3%	66.7%
The program activities were organized & clearly defined.	0	0	11.1%	44.4%	44.4%

	Not at All		Somewhat		A Great Deal
Participating in this program was a quality experience worth my time.	0	0	0	11.1%	88.9%
This experience will help in considering future educational or occupational goals.	0	0	22.2%	33.3%	44.4%
I will recommend this experience to others.	0	0	0	11.1%	88.9%

How can we improve?

Please take a minute to give us any suggestions or feedback about how we might improve this experience.

- It was an amazing experience and I wouldn't have learned what I did without it. It would have been nice to have more time, though.
- I thought the experience was awesome! Nothing like I've ever done before.
- I really enjoyed my experience here and would not change a thing.
- I really enjoyed the experience. Maybe we could pick our own bunks. It was cool times a million.

Objective 3: To help design, complete, summarize, & present an independent research project.

Score	Pre-program		Post-program	
	# Participants	% Participants	# Participants	% Participants
1	2	11.8%	0	0
2	1	5.9%	0	0
3	4	23.5%	2	11.8%
4	8	47.0%	9	52.9%
5	2	11.8%	6	35.3%

Average Score:

Pre-test = 3.41 Post-test = 4.24 Difference = 0.83*

* Indicates a statistically significant change ($p < 0.001$)

Objective 4: To promote a sense of stewardship towards the Great Lakes watershed.

Score	Pre-program		Post-program	
	# Participants	% Participants	# Participants	% Participants
1	2	11.8%	0	0
2	6	35.3%	0	0
3	7	41.2%	0	0
4	2	11.8%	6	35.3%
5	0	0	11	64.7%

Average Score:

Pre-test = 2.53 Post-test = 4.65 Difference = 2.12*

* Indicates a statistically significant change ($p < 0.001$)

18 Student Responses

Reaction to the program

To what extent do you agree with the following statements? Please circle the number that represents your feedback. Numbers range from 1 (not at all) to 5 (a great deal).

	Not at All		Somewhat		A Great Deal
The Education Director instructed in a clear & concise manner.	0	0	0	16.7%	83.3%
The instructors & crew answered questions completely & knowledgeably.	0	0	0	16.7%	83.3%
The program was exciting & held my interest.	0	0	0	33.3%	66.7%
The program materials were complete & useful.	0	0	0	16.7%	83.3%

	Not at All		Somewhat		A Great Deal
The program activities were organized & clearly defined.	0	0	0	22.2%	77.8%
Participating in this program was a quality experience worth my time.	0	0	5.6%	16.7%	77.8%
This experience will help in considering future educational or occupational goals.	0	11.1%	11.1%	33.3%	44.4%
I will recommend this experience to others.	0	0	5.6%	11.1%	83.3%

How can we improve?

Please take a minute to give us any suggestions or feedback about how we might improve this experience.

- Choose the trip dates based on weather. The seas were a bit rough.
- This program is great. I think it is perfect as it is.
- Let us swim while on board. It will make it more fun.
- The deckhands were cool. I can't think of anything to change.
- Nothing. It would just be a lot better if it was warmer.

Objective 3: To help design, complete, summarize, & present an independent research project.

Score	Pre-program		Post-program	
	# Participants	% Participants	# Participants	% Participants
1	3	11.1%	0	0
2	0	0	1	3.7%
3	8	29.6%	1	3.7%
4	6	22.2%	5	18.5%
5	10	37.0%	20	74.1%

Average Score:

Pre-test = 3.74 Post-test = 4.63 Difference = 0.89*

* Indicates a statistically significant change ($p < 0.001$)

Objective 4: To promote a sense of stewardship towards the Great Lakes watershed.

Score	Pre-program		Post-program	
	# Participants	% Participants	# Participants	% Participants
1	4	14.8%	0	0
2	7	25.9%	0	0
3	8	29.6%	1	3.7%
4	7	25.9%	6	22.2%
5	1	3.7%	20	74.1%

Average Score:

Pre-test = 2.78 Post-test = 4.70 Difference = 1.92*

* Indicates a statistically significant change ($p < 0.001$)

28 Student Responses

Reaction to the program

To what extent do you agree with the following statements? Please circle the number that represents your feedback. Numbers range from 1 (not at all) to 5 (a great deal).

	Not at All		Somewhat		A Great Deal
The Education Director instructed in a clear & concise manner.	0	0	0	32.1%	67.8%
The instructors & crew answered questions completely & knowledgeably.	0	0	0	21.4%	78.6%
The program was exciting & held my interest.	0	0	14.3%	21.4%	64.3%
The program materials were complete & useful.	0	0	0	28.6%	71.4%

	Not at All		Somewhat		A Great Deal
The program activities were organized & clearly defined.	3.6%	0	7.1%	25.0%	64.3%
Participating in this program was a quality experience worth my time.	0	0	3.6%	28.6%	67.8%
This experience will help in considering future educational or occupational goals.	0	3.6%	10.7%	28.6%	57.1%
I will recommend this experience to others.	0	0	7.1%	10.7%	82.1%

How can we improve?

Please take a minute to give us any suggestions or feedback about how we might improve this experience.

- Nothing, it was so much fun. Thanks.
- Nothing, really, it was interesting and easy to follow. Sailing was fun, too.
- Maybe a possible tour of the boat when we first arrived.
- Do more little activities between times.
- This was wonderful. The Timber lodging was not quite satisfactory, but that was only a slight inconvenience. Ten thumbs up for Inland Seas.

IV. SPECIALITY PROGRAMS

IV. SPECIALTY PROGRAMS

A. MARITIME HISTORY OF SUTTONS BAY

6 Participant Responses

Instructions: Please help us improve our educational programs by giving us some feedback about your experience aboard the schooner *Inland Seas* this evening. Please return this survey to your instructor before departing. Thanks you for sailing with us!

1. What did you enjoy most about this program?

- The entire program was very enjoyable – we would do it again and not change a thing.
- Helping hoist sails, being out on the bay, Captain’s talk about fish and lake history, and the bread on the sandwiches.
- The casual, but clear, method of instruction. Informative, but not pretentious.
- Everything.
- It was all enjoyable and interesting! Even the food was great!
- All the information. Sailing.

2. What could we do to improve the presentations or facilities?

- You don’t need to do anything more. (2)
- Shorten the demonstration. More water available to drink instead of lemonade.
- Use the PA system – the voices rise and fade.
- Add a wine toast.
- Speak a little louder.

3. Is there anything we could leave out?

- No! (4)

4. Any other comments?

- I learned a lot about the area.
- Enjoyed the chow.
- Food was terrific. Trip was terrific.
- Thanks to the crew and volunteers.

V. ISEA VOLUNTEER INSTRUCTORS

V. ISEA VOLUNTEER INSTRUCTORS

A. VOLUNTEER INSTRUCTOR TRAINING PROGRAM

Session 1: Introduction to ISEA and our Great Lakes Schoolship & Center Programs

26 Participant Responses

How would you rate the following?

	Poor	Fair	Good	Great
Clarity of presentation	0	3.8%	42.3%	53.8%
Pace of presentation	0	3.8%	42.3%	53.8%
Quality of visuals used	0	3.8%	57.7%	38.5%
Clarity of written materials	0	0	38.5%	61.5%
Effectiveness of small groups	na	na	na	na

Amount of material presented:

Not Enough (0)

Just Right (96%)

Too Much (4%)

Are you a new volunteer or a veteran?

New (88%)

Veteran (12%)

Comments/Questions:

- Mathematics/Geology?
- Great introductory presentation.
- Good looking program, well organized. Enthusiastic leadership.
- Looking forward to learning more and volunteering!
- Have a greeter at the door to meet new volunteers when they come in. Thank you.

Session 2: The Great Lakes & Global Freshwater

CANCELLED

Session 3: Sample Collections & Weather

23 Participant Responses

How would you rate the following?

	Poor	Fair	Good	Great
Clarity of presentation	0	8.7%	60.9%	30.4%
Pace of presentation	0	4.3%	65.2%	30.4%
Quality of visuals used	0	0	52.2%	47.8%
Clarity of written materials	0	0	54.5%	45.4%
Effectiveness of small groups	0	8.7%	47.8%	43.5%

Amount of material presented:

Not Enough (4%)

Just Right (91%)

Too Much (4%)

Are you a new volunteer or a veteran?

New (86%)

Veteran (14%)

Session 6: ISEC & Wetland

19 Participant Responses

How would you rate the following?

	Poor	Fair	Good	Great
Clarity of presentation	0	0	47.4%	52.6%
Pace of presentation	0	0	47.4%	52.6%
Quality of visuals used	0	0	31.6%	68.4%
Clarity of written materials	0	0	38.5%	61.5%
Effectiveness of small groups	na	na	na	na

Amount of material presented:

Not Enough (0)

Just Right (100%)

Too Much (0)

Are you a new volunteer or a veteran?

New (89%)

Veteran (11%)

Comments/Questions:

- Presentation was very good. Worthwhile session to acquire new people with the Center.
- Great Center!

Session 7: Plankton

12 Participant Responses

How would you rate the following?

	Poor	Fair	Good	Great
Clarity of presentation	0	0	58.3%	41.7%
Pace of presentation	0	0	66.7%	33.3%
Quality of visuals used	0	8.3%	33.3%	58.3%
Clarity of written materials	0	0	63.6%	36.4%
Effectiveness of small groups	0	20.0%	60.0%	20.0%

Amount of material presented:

Not Enough (8%)

Just Right (92%)

Too Much (0)

Are you a new volunteer or a veteran?

New (92%)

Veteran (8%)

Comments/Questions:

- Excellent overall presentation.

Session 8: Fishes

17 Participant Responses

Are you a new volunteer or a veteran?

New (64%) Veteran (37%)

Comments/Questions:

- Videos needed. Need dates so we know which pages are new.

Session 11: Teaching Strategies (Jerry & Carol Inman)

18 responses

How would you rate the following?

	Poor	Fair	Good	Great
Clarity of presentation	0	0	38.8%	61.1%
Pace of presentation	0	0	50.0%	50.0%
Quality of visuals used	0	0	44.4%	55.6%
Clarity of written materials	0	0	47.1%	52.9%
Effectiveness of small groups	0	0	50.0%	50.0%

Amount of material presented:

Not Enough (0) Just Right (100%) Too Much (0)

Are you a new volunteer or a veteran?

New (67%) Veteran (33%)

Comments/Questions:

- Excellent presentation of important information.
- Some very good discussion subjects.
- Carol was really inspiring and reassuring.

Session 12: Review

17 responses

How would you rate the following?

	Poor	Fair	Good	Great
Clarity of presentation	0	0	52.9%	47.1%
Pace of presentation	0	0	52.9%	47.1%
Quality of visuals used	0	0	50.0%	50.0%
Clarity of written materials	0	6.3%	50.0%	43.7%
Effectiveness of small groups	0	0	47.1%	52.9%

Amount of material presented:

Not Enough (0) Just Right (100%) Too Much (0)

Are you a new volunteer or a veteran?

New (81%) Veteran (19%)

Comments/Questions:

- Visually blocked by presenter.
- Can't wait to be an instructor!
- Thanks for your enthusiasm. I'm ready to go!

B. VOLUNTEER INSTRUCTOR YEAR-END SURVEY

25 Instructor Responses

Instructions: *THANK YOU for taking the time to fill out this survey. We are always looking for ways to improve our education programs. We want to provide the best possible experience for both our students and our instructors. Your thoughts are important to us!*

1. Are you a new or veteran volunteer?

New (8%)

Veteran (92%)

If you are a veteran instructor, how many years have you volunteered with ISEA?

1-5 (42%)

6-10 (50%)

11-15 (0)

15+ (8%)

2. How would you rate the amount of time you spent volunteering for ISEA this year?

Not enough (40%)

Just right (60%)

Too much (0)

Example Comments:

- Not enough of the beautiful, sunny days and enough of the rainy, cold, wet, nasty days!
- I would have liked to have volunteered more this year than I did, but I had many other commitments which limited my time.

3. What was your impression of the overall organization of the Schoolship and Education Center programs this year?

Poor (0)

Fair (0)

Moderate (0)

Good (60%)

Excellent (40%)

Suggestions for improvement (example comments):

- I think we need a good way to cancel shipboard teaching when the weather is so foul and have the classes at the Center.
- Amazing organization. The communication and scheduling is not an easy job, but you all do it very well.
- More guidance for new instructors. Be sure they can observe at least twice before being on their own.

4. How would you describe your interactions with our Education Director, Christine Crissman?

Poor (0)

Fair (0)

Moderate (0)

Good (26%)

Excellent (74%)

Example Comments:

- I think she is a wonderful person and ISEA is very lucky to have her as part of their organization.
- Outstanding director. Very professional. Great ideas. Relates well to students, volunteers, staff, etc. Nice easy going manner.
- She is a super director and extremely well versed and organized.

5. How would you describe your interactions with the Lead Instructors throughout the Schoolship Programs this year?

Poor (0)

Fair (0)

Moderate (0)

Good (42%)

Excellent (58%)

Example Comments:

- All were conscientious and well prepared.

- All different styles, but each brings a different angle to the program. I learned something from each of them, and tried to adopt some of their educational methods.
- Everyone is different to work with, some are more fun than others, but they all seem to get the job done and are comfortable working with the students.

6. How would you describe your interactions with other volunteers throughout the Schoolship Programs this year?

Poor (0) Fair (0) Moderate (0) Good (52%) Excellent (48%)

Example Comments:

- All seemed committed to providing the best program they could for students.
- All the volunteers are so nice and cooperative to give the kids the best possible experience. Great attitudes.
- I like the mix of new instructors and seasoned veterans. It is interesting how we can all teach the same station, but use different ways to present the materials.

7. How would you describe your interactions with the sailing crew (Captains, Mates, Deckhands, Cook)?

Poor (0) Fair (4%) Moderate (0) Good (29%) Excellent (67%)

Example Comments:

- Friendly, informative, very efficient. Students felt no concerns related to being on a sailboat in the bay.
- The crew really makes the volunteers feel welcome on board the *Inland Seas*.
- The safety of the students and the instructors was their top priority, and although they appeared casual and fun, they constantly did their job in the most professional way. They also had great patience for those of us who never sailed before and don't know anything about boats.

8. How would you describe the overall student experience aboard the Schoolship and in the Education Center?

Poor (0) Fair (0) Moderate (0) Good (36%) Excellent (64%)

Suggestions for improvement (example comments):

- It is always evident to me as an instructor when the teacher has created an interest in the program with the kids prior to the actual sail.
- It is amazing to see how often a group of kids shows up looking all sleepy and disinterested, and by the time they are on board, they are all excited and involved. It is a great program. I think they get a good overview of the issues of the bay.
- Excellent introduction to real science related learning about the history and overall water quality of the Great Lakes.

9. How would you describe the volunteer training classes in terms of preparing you to teach aboard the Schoolship and in the Education Center?

Poor (0) Fair (0) Moderate (5%) Good (47%) Excellent (47%)

Suggestions for improvement (example comments):

- I would like to take the one day course to refresh myself. However, the session is typically offered mid-week which is challenging to get to. I would ask that you consider a Saturday for this all day session.

- The training classes are clear, concise, and well taught. The book is organized in a way that we can easily review it and make sure we cover the basics you want us to cover. Then there is more information for when we feel comfortable expanding out teaching. The practice during the classes and the first day out on the boat was invaluable, and the shadowing process helps everyone feel comfortable with teaching a station.
- It seemed that more new instructors were coming onboard to shadow this year – a good thing as long as they do get kicked out of the nest fairly soon.

10. Is there anything we can do to help make your Schoolship or Education Center experience better?

Example Comments:

- I sometimes get the feeling we are a little slow getting the Schoolship Program going and getting the students involved right off the bat. A little more enthusiasm and excitement on our part and the lead in some cases would “grab” the students and get them fired up.
- Improved rain gear and warm clothes for the students who do not come prepared for the elements.
- Lead instructor should always end with a review. Some do, some don’t. Very important.

11. Please provide any additional comments about your experiences with ISEA programs this year.

Example Comments:

- I am really impressed with this organization and glad to be able to participate with the great people involved, supporting such a great cause. Plus, I really like going out on the boat and working with the kids. I am looking forward to next year.
- It is definitely noticeable when the students have been “prepped” by the classroom teacher before their arrival. When the kids have had some background ahead of time it certainly makes the entire experience more real and pertinent to the issues and education goals.
- I felt the changes in the Stewardship Station that were made for this year to be good. The station was easier to teach. The students understood the concepts of the station much better and were able to participate much more fully. The station concepts were too complicated and too extensive the previous year. It overwhelmed them. This year was so much better for all.

VI. 2010 ACTION PLAN

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The primary purpose of this evaluation process is to provide ISEA educational personnel with insight into the strengths and weaknesses of the education programs. Weaknesses are identified in terms of objectives not met and are addressed by implementing necessary changes to the Volunteer Instructor Manual, the Volunteer Instructor Training Program, shipboard program materials, shipboard instruction, and evaluation materials.

In 2008, the Stewardship Station was introduced into the Schoolship Program. This learning station has been received well by teachers, students, and volunteer instructors and will continue to be a part of the Schoolship Program. In 2010, ISEA will strive to make this station more hands-on and interactive for all age levels. One option is to explore introducing scenarios into the Stewardship Station where students must decide the best stewardship action to take in different situations.

The evaluations designed for the Schoolship Program have proven effective since implementing student evaluations based on student reading levels and subject matter complexity for elementary, middle, and high school levels. These evaluations are continually updated to reflect any changes in information taught during each learning station. The evaluation materials are used by teachers as a way to reinforce concepts learned aboard the Schoolship and to validate the importance of what was learned outside the classroom. In 2010, evaluation materials will again be distributed to all teachers and students participating in the Schoolship Program. The 2010 student evaluations have been updated to better reflect subject matter complexity and reading levels for each grade. Student evaluation results will also be distributed to each participating teacher after the Schoolship season has ended.

An analysis of student performance on each question of the Schoolship Program's student evaluations was completed to identify areas of difficulty for students in different grade levels. Of particular concern are questions that less than 70% of the students answered correctly. There were two questions on the level B student evaluations and one question on the level C evaluation that less than 70% of the students answered correctly (all level A questions were answered correctly by at least 70% of the students). The major areas of concern were identifying benthos as recyclers of organic material, labeling phytoplankton on a food web, and identifying which organisms in a food web had the highest level of contaminants and which were decomposers. The food web diagram and corresponding questions have been updated in the 2010 student evaluations. This food web diagram now closely resembles the diagram used during the Schoolship Program. The other area of concern will be emphasized in the Volunteer Instructor Training Program. Benthos instructors will be made aware of these areas of difficulty during volunteer instructor training sessions and will work to clarify these concepts through their teaching aboard the Schoolship.

In addition to these specific modifications, efforts will be made to improve the quality of instruction and effectiveness of the evaluation tools for all of ISEA's educational programs. ISEA's evaluation studies give staff and volunteer instructors important pieces of information used to increase the efficiency of instruction and to provide the most educational and memorable experience possible. ISEA is dedicated to continue this process of revisions and improvements in years to come.