

Appendix III

Global Ocean Science Education Workshop Participant Evaluation Summary

by

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Abstract: The first Global Ocean Science Education Workshop was held over a two-day period in June 2015 at the University of Rhode Island Narragansett Bay Campus. The overarching goal was to forge an international ocean science education community by sharing expertise and developing global initiatives to improve ocean literacy. The workshop was attended by 76 ocean science researchers and ocean science educators from around the world. This report presents the evaluation of the Workshop to aid the organizers in their planning for the next workshop. The 34 respondents reported finding the four goals of the workshop appropriate and achieved, the eight presentations clear and helpful, and the six group sessions and four panels helpful in achieving the overarching goal. As a result of attending the workshop, participants could describe specific examples of changes in their knowledge, behavior, thinking, and attitudes concerning global ocean science education. For the next global ocean science workshop, respondents suggested partnering with an existing world-wide ocean science education organization to encourage broader participation and help defray the cost for more international participants

Purpose of the Evaluation: The purpose of this evaluation is to provide the organizers of the first Global Ocean Science Education Workshop, held on June 26 and 27 of this year at University of Rhode Island Narragansett Bay Campus, with feedback from the responding participants about how the workshop went and how to improve the next one.

Methods: The workshop had four goals.

1. "A central goal is to forge an international ocean science education community focused on the education pipeline - elementary through graduate school - with the full engagement of the ocean science research community."
2. "The workshop is intended to broaden current ocean literacy initiatives by developing strategies for integrating undergraduate and graduate education, while leveraging international ocean science research."
3. "The workshop will contain a mix of scientific presentations, dialogs focused on the potential for international collaboration, the identification of goals and priorities for global ocean science education, and the production of a document that outlines steps forward for the international community."
4. "During the workshop we will demonstrate and use different technologies to engage ocean scientists, ocean educators, and learners of all ages in ocean exploration and ocean issues and create more networking opportunities globally."

The assessment of participants' perceptions of how well each of the four goals was achieved occurred at the end of July. Participants were asked to complete an online survey using Survey Monkey. Seventeen closed and open-ended questions were developed by the evaluator and vetted by the organizers of the workshop to make sure that the answers to the questions likely would provide them with the needed feedback to improve the planning of the follow-up workshop (see Appendix 1 for a copy of the survey).

Rate of Return:

The survey URL was sent shortly after July 4th to the 76 participants via their email addresses by the staff of the Consortium for Ocean Science Exploration and Engagement (COSEE) out of the University of Rhode Island Graduate School of Oceanography (GSO). Fourteen participants completed the survey for an initial response rate of 20%. Two reminders were sent out on July 23rd and July 29th respectively. Seventeen more responded to the first reminder for a response rate of 44% and an additional three responded to the second reminder for a total response rate of 48%. Thus, a little less than half of the participants (34 out of 76) completed the survey.

Results: The survey questions were divided into four areas of interest: 1) demographics of the participants, 2) evaluation of the workshop, 3) impact of the workshop, and 4) suggestions for the follow-on workshop. See Appendix 2 for a PowerPoint presentation of the results for each question of the survey.

1. Demographic Results:

Of the respondents who indicated their gender (32), 23 or 72% were female (Question 13). Most of the respondents (32) were from North America (24 or 75%) with one respondent from South America (3%), two from the European Union (6%), two from Asia (6%), three from Australia and Pacific Islands (9%) (Question 14). Ten of the 34 respondents indicated they were ocean science researchers (29%); 18 (53%) indicated they were ocean science educators, and six (18%) indicated they were K-12 educators (Question 15).

A. Evaluator's Conclusions Concerning Demographic Mix of Past Workshop

1. The vast majority of participants were from North America, although a surprising number came from other parts of the world given that the workshop was held in New England.
2. There was a good mix of ocean science researchers and ocean science educators.

B. Evaluator's Recommendations Concerning Demographics Mix of Next Workshop

1. The organizers of the next workshop should continue to strive to attract participants from around the world, as participants found international ocean science education perspectives extremely helpful. Finding an outside sponsor to help fund the travel expenses of a future workshop is recommended. Running the workshop virtually is another option to increase international participation.

2. Evaluation of the Past Workshop Results:

The first eight questions focused on the adequacy of the logistics for the workshop, the appropriateness of the four goals of the workshop, the effectiveness of how well the components of the workshop helped achieve the four goals of the workshop, and the overall quality of the workshop.

Question 1 focused on the quality of the logistical activities for the workshop provided by the University of Rhode Island staff. All nine areas of logistics that were evaluated were positively rated as "adequate"

or "somewhat adequate" by the respondents: 1) registration-100%; 2) website-100%; 3) transportation to and from the workshop-97%; 4) presentation room-97%; 5) meeting rooms-100%; 6) hotel accommodations-100%; 7) meals-97%; 8) technology-100%; and 9) staff-100%.

Question 2 focused on the appropriateness of the four goals for the workshop. All four goals were mostly seen as "very appropriate" or "somewhat appropriate" as follows:

1. Goal 1-Forge an international ocean science education community (88%).
2. Goal 2-Broaden current ocean literacy initiatives (88%).
3. Goal 3-Produce a document (79%).
4. Goal 4-Demonstrate and use different technologies (82%).

Question 3 focused on how well the Goals 1, 2, and 4 were achieved. (Note: Goal 3 was not evaluated because the document was not published at the time of the administration of the survey.) Goals 1 (82%) and 2 (73%) were rated "achieved" or "mostly achieved", with goal 4 (55%) rated somewhat less achieved than the other two.

Question 4 rated the clarity of the eight presentations. The following table presents the percentage of ratings that were either "Very Clear" or "Somewhat Clear." All were highly rated as clearly presented.

Presentation	Percentage of Very Clear or Somewhat Clear Ratings
Clinical Ocean Sciences Topics by Dr. Francesca Santoro	100%
Ocean Research Priorities by Dr. James Yoder	100%
Communication Technologies-Opportunities for Virtual Engagement by Dr. Dwight Coleman	97%
Leveraging International Ocean Research Technologies by Dr. Scott Glenn	100%
Advancements in Tropical Cyclone and Hurricane Forecasting by Dr. Isaac Ginis	97%
Collaborations Among the Pacific Islands by Dr. Judy Lemus	97%
Ocean Science for Coastal Resiliency by Judith Swift	100%
Trans-Atlantic Update on the Galaway Agreement by Paula Keener, NOAA	97%

Question 5 rated the eight presentations on how well they helped achieve the four goals of the workshop. The following table presents the percentage of ratings that were either "helped" or "somewhat helped" achieve the four goals of the workshop. All eight presentations were rated as helping achieve the goals of the workshop with the rating of the "Advancements in Tropical Cyclone and Hurricane Forecasting" being somewhat rated lower than the other seven.

Presentation	Percentage of Helped or Somewhat Helped Achieve the Four Goals of the Workshop Ratings
Clinical Ocean Sciences Topics by Dr. Francesca Santoro	100%
Ocean Research Priorities by Dr. James Yoder	100%
Communication Technologies-Opportunities for Virtual Engagement by Dr. Dwight Coleman	100%
Leveraging International Ocean Research Technologies by Dr. Scott Glenn	100%
Advancements in Tropical Cyclone and Hurricane Forecasting by Dr. Isaac Ginis	81%
Collaborations Among the Pacific Islands by Dr. Judy Lemus	97%
Ocean Science for Coastal Resiliency by Judith Swift	94%
Trans-Atlantic Update on the Galaway Agreement by Paula Keener, NOAA	100%

Question 6 rated the six group activities of the workshop, two Breakout Groups, two Working Groups or two Group Discussion sessions, on how well they helped achieve the four goals of the workshop. The following table presents the percentage of ratings that either "helped" or "somewhat helped" achieve the four goals of the workshop. All six group work sessions were rated as helping achieve the goals of the workshop.

Group Work Sessions	Percentage of Helped or Somewhat Helped Achieve the Four Goals of the Workshop Ratings
Setting Priorities for Ocean Science Education, Breakout Groups	100%
Use of Communication Technologies, Group Discussion	100%
Education Pipeline Collaborations, Breakout Group Discussions	100%
Leveraging International Ocean Science Research Programs for Education, Breakout Groups	96%
Building a Global Ocean Science Education Network, Group Discussion	100%
Setting the Course, Working Groups	100%

Question 7 rated the clarity of the presentation of each of the four panels. The following table presents the percentage of ratings that were either "clear" or "somewhat clear." All achieved high clarity ratings.

Panel	Percentage of Clear or Somewhat Clear Panel Ratings
Panel I: Undergraduate Ocean Education Across the Ocean Basins	94%
Panel II: Graduate Ocean Education Across the Ocean Basins	94%
Panel III: Elementary and Secondary Ocean and Great Lakes Education	91%
Panel IV: Public Ocean Education Across the Ocean Basins	100%

Question 8 rated the four panels on how well they helped achieve the four goals of the workshop. The following table presents the percentage of rating that "helped" or "somewhat helped" achieve the four goals. All four panels received almost unanimous high ratings.

Panel	Percentage of Helped or Somewhat Helped Achieve the Four Goals of the Workshop Ratings
Panel I: Undergraduate Ocean Education Across the Ocean Basins	97%
Panel II: Graduate Ocean Education Across the Ocean Basins	97%
Panel III: Elementary and Secondary Ocean and Great Lakes Education	100%
Panel IV: Public Ocean Education Across the Ocean Basins	100%

A. Evaluator's Conclusions Concerning Quality of the Past Workshop

1. The goals of the workshop were seen as appropriate. More work could be done to demonstrate different educational technologies.
2. The workshop was well designed and implemented. The various activities from presentations to group work to panels were all rated at clearly presented and contributing to the achievement of the four goals of the workshop.

B. Evaluator's Recommendations Concerning Improvement of Quality of the Next Workshop

1. Continue with a mix of presentations, group work, and panels in the next workshop as they were well received by the past participants.
2. Given the cost and difficult logistics in holding a face-to-face follow-up workshop, explore conducting a series of future workshops using a webinar format.

3. Impact of the Workshop Results:

Four questions were designed to assess the short-term impact (within about a month) of attending the workshop. Four potential impact areas on participants were examined: **change in knowledge**, **change in behavior**, **change in thinking**, and **change in attitude** about ocean science education. All impact data is based upon participant self-assessment responding to open-ended questions.

Question 9 assessed the self perceptions of changes participants had regarding their **knowledge** about ocean science education. The results are presented below.

Q9 As a result of attending the Global Ocean Science Education Workshop, please describe any changes you have had regarding your knowledge about ocean science education.

Answered: 20 Skipped: 15

Responses Date

- 1 I am now aware of new resources & initiatives to share with my students. I also have a much better understanding of the key issues that should be discussed
7/30/2015 5:22 PM
- 2 Dr. Scowcroft's comment towards the conclusion of the conference that scientists should not be advocates is indicative of why ocean science education has failed to effect more positive change with regard to promoting environmental stewardship as a global priority
7/29/2015 2:15 AM
- 3 Learned about many different resources available (communication, citizen science projects, etc.). I really enjoyed hearing perspectives from not only different sectors in ocean science education, but also from all over the world. It is eye-opening to hear about ocean education in other countries and the challenges they face and the successes they have had.
7/28/2015 2:48 PM
- 4 So many initiatives around the world and so many good ideas to be inspired from. An excellent source of knowledge and a change in the way of thinking - inspired by international colleagues.
7/27/2015 6:47 AM
- 5 Increased awareness of what is happening in other countries. 7/24/2015 12:23 PM
- 6 I am more aware of opportunities for collaboration and able to integrate them to future implementations. I feel that you have a great network and I hope to interact with participants.
7/24/2015 8:52 AM
- 7 Was made aware of education tools/initiatives that I did not know about before. 7/24/2015 8:14 AM
- 8 I received new, broader perspective on ocean literacy concept and the possibilities on global ocean education cooperation. I am more aware about the ocean related issues that are discussed in other parts of the world.
7/24/2015 4:44 AM
- 9 Broader perspectives and super networking 7/23/2015 9:46 PM
- 10 I learned quite a bit from Francesca Santoro's presentation. 7/23/2015 7:47 PM
- 11 A better understanding of what is happening in various countries/regions 7/23/2015 7:05 PM
- 12 I learned about different approaches that some groups are undertaking in their efforts. 7/20/2015 2:39 PM
- 13 It would have remarkable changes to my knowledge about the Ocean Science Education worldwide specially outside Bangladesh. I would not have that much idea of what's going on as I have the experiences from the presentations and people connected and attended.
7/19/2015 10:06 AM
- 14 The workshop was a very necessary first step in what should now be a growing movement to facilitate global collaboration in ocean science education globally.
7/17/2015 6:41 PM
- 15 Really like the idea of partnering with UNESCO so that it is truly global ocean science education rather than being dominated by one nation or perspective.
7/16/2015 12:38 PM
- 16 I know more about hurricanes and the ocean, acidification, UNESCO efforts, and many ocean science education initiatives around the world that I did not know about.
7/16/2015 6:58 AM
- 17 Helpful to know what is going on in other countries. 7/15/2015 8:48 PM
- 18 I am much more aware of the disparities and complexities of international ocean science education across the globe.
7/15/2015 7:57 PM
- 19 Huge knowledge gain in many arenas 7/15/2015 6:28 PM
- 20 Globally we will have to share more information to standardize the education of the ocean 7/15/2015 5:08 PM

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Global Ocean Science Education Workshop Follow-up Survey

Question 10 assessed the self perceptions of changes participants had regarding their **behavior or actions** related to ocean science education.

Q10 As a result of attending the Global Ocean Science Education Workshop, please describe any changes you have had regarding your behavior or actions related to ocean science education.

Answered: 14 Skipped: 21

Responses Date

- 1 See above 7/30/2015 5:22 PM
- 2 I am incorporating some of what I learned into our strategic plan. For example, promoting citizen science projects to our constituents to increase our knowledge base.
7/28/2015 2:48 PM
- 3 Nothing yet, but I will certainly make a strong attempt to attend any future Global Ocean Science Education workshops.
7/24/2015 12:23 PM
- 4 I felt that people in the workshop are already working on promoting educational opportunities for undergraduates and specially graduate students that multiply efforts in Ocean Science Education and offer them practical teaching/communicating experiences.
7/24/2015 8:52 AM
- 5 I can recommend to others some of these tools. 7/24/2015 8:14 AM
- 6 More energetic 7/23/2015 9:46 PM
- 7 N/A 7/20/2015 2:39 PM
- 8 The most important motivation I have is to start a public movement to develop a mid high school curriculum for our students here in Bangladesh Which I had never thought before my participation in the workshop
7/19/2015 10:06 AM
- 9 I am even more determined to contribute both internationally and in my own nation. 7/17/2015 6:41 PM
- 10 Inspired me to run more local programming and write more blogs and articles for broader reach. 7/16/2015 12:38 PM
- 11 I am continuing to aid an international effort to promote global ocean science education. 7/16/2015 6:58 AM
- 12 Talking with colleagues about it. 7/15/2015 8:48 PM
- 13 I am more invigorated to learn how I can interact with other K-12 ocean science educators in a manner beyond that of which I am accustomed, that is, teacher workshops such as NSTA and science meetings such as AGU.
7/15/2015 7:57 PM
- 14 actually now meeting with a McGraw Hill publisher to be part of their educator review team for a new Marine Science textbook
7/15/2015 6:28 PM

Question 11 assessed the self perceptions of changes participants had regarding their **thinking** about ocean science education. The results are presented below.

Q11 As a result of attending the Global Ocean Science Education Workshop, please describe any changes you have had regarding your thinking about ocean science education.

Answered: 16 Skipped: 19

Responses Date

- 1 There is hope! It was an honor to be a part of this workshop. I met many wonderful people and learned so much. I left feeling inspired and ready to take on the challenges. We all have the same mission of educating about our precious ocean so that people can take action to protect it. We will continue to face challenges, but collectively we can make a difference!
7/28/2015 2:48 PM
- 2 Ocean science education can include different aspects and methods and to be in close contact with educators gives a totally different perspective to ocean literacy as I knew it (until now).
7/27/2015 6:47 AM
- 3 Heightened awareness of critical needs. 7/24/2015 12:23 PM

- 4 I think that although there are many things to be done, there has been a great deal in the advancement of ocean science education.
7/24/2015 8:52 AM
- 5 There are a lot of innovative programs/approaches out there. It was good to hear about them. 7/24/2015 8:14 AM
- 6 Think and act more global, while promoting the local biodiversity and discussing local key issues. 7/24/2015 4:44 AM
- 7 Greater need and urgency 7/23/2015 9:46 PM
- 8 I learned there is a lot of good will out there to collaborate and that is really energizing. There is a lot of power in unifying our voices and better connecting between groups/initiatives. But we still lack a real process for getting us there.
7/20/2015 2:39 PM
- 9 That huge, the way of my thinking regarding research, education and application of ocean science has been remarkably changed
7/19/2015 10:06 AM
- 10 No particular change in my thinking other than the fact this was a valuable first step in what will be a long (but highly important) project.
7/17/2015 6:41 PM
- 11 I really like the idea of moving beyond transatlantic ocean literacy. 7/16/2015 12:38 PM
- 12 I came to realize that just like oceans are international, so must ocean science education be international and not just local.
7/16/2015 6:58 AM
- 13 There is much to be done; trying to think of ways to work with others or seek opportunities to move forward. Hopefully COSEE can play a role in that.
7/15/2015 8:48 PM
- 14 I wonder how realistic it is to think of a coordinated approach to an international collaboration. Perhaps as suggested, we all focus on 1-2 concepts/issues/concerns each year in the manner of say, International Science years.
7/15/2015 7:57 PM
- 15 I have really worked on a diagram and fleshing out the differences b/w ocean science, ocean science education, ocean literacy and ocean science literacy and how all these fit together yet are different. I've also tried to overlay pedagogy with that.
7/15/2015 6:28 PM
- 16 There is still much to do so we can say that people from all over the world understand the importance of preserving the ocean
7/15/2015 5:08 PM

Question 12 assessed the self perceptions of changes participants had regarding their **attitude** about ocean science education. The results are presented below.

Q12 As a result of attending the Global Ocean Science Education Workshop, please describe any changes you have had regarding your attitude about ocean science education.

Answered: 16 Skipped: 19

Responses Date

- 1 It is helpful to learn about initiatives across the globe & strive to work together to improve effectiveness & impact 7/30/2015 5:22 PM
- 2 Same as above. 7/28/2015 2:48 PM
- 3 It is both global and local. And they are both important ideas to keep in mind. Also, there are so many variations depending on the language and the culture, it is crucial to always pay attention to the local particularities.
7/27/2015 6:47 AM
- 4 Attitude already strongly in favor. 7/24/2015 12:23 PM
- 5 I reinforced my idea of the need for special attention towards ocean science education for underserved communities.
7/24/2015 8:52 AM
- 6 We really need to collate all the tools that already exist so we can make them more available to educators. 7/24/2015 8:14 AM
- 7 I am more opened to international cooperation. 7/24/2015 4:44 AM
- 8 I think we all leave these meetings quite enthused and optimistic. We have to find a way to keep the momentum up in the long span between meetings.
7/20/2015 2:39 PM
- 9 yes I have 7/19/2015 10:06 AM
- 10 Sa in 11 above. 7/17/2015 6:41 PM
- 11 In terms of attitude, I came away feeling that it is even more important for scientific academic circles to admit that there are other scientific perspectives with validity. Within the history of science there is an over-arching colonial mind-set which can be more than off-putting when it comes to "educating the great unwashed". ; -)
7/16/2015 12:38 PM
- 12 Because of the international focus of this workshop, I broadened my appreciation of the importance of global ocean science education.

7/16/2015 6:58 AM

13 Hopeful, yet concerned. 7/15/2015 8:48 PM

14 I am more focused in what I wish to impart to my students and in sharing with my colleagues (and educators beyond my immediate cohort) after having attended this workshop.

7/15/2015 7:57 PM

15 I now view it very differently from ocean literacy. 7/15/2015 6:28 PM

16 I will try harder to spend more global information (least regional) on the changes that are affecting the ocean. 7/15/2015 5:08 PM

A. Evaluator's Conclusions Concerning the Impact of the Past Workshop

1. Twenty respondents provided examples of how their **knowledge** changed as a result of attending the workshop. The examples can be generally grouped into two areas: 1) increased knowledge about key issues and resources (1, 3, 10, 19); 2) increased knowledge of international efforts and potential for international collaboration (2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16,17,18, 20).

2. Fourteen respondents listed examples of how their **behavior** has changed as a result of attending the workshop. The examples included: 1) modifying their organization's strategic plan to include promoting citizen science projects, 2) recommending to others resources and tools obtained from the workshop, 3) starting a public movement to develop a mid high school curriculum for our students in Bangladesh, 4) running more local programs on ocean education, and 5) using my new knowledge to be part of an educator review team for a new marine science textbook.

3. Sixteen respondents provided examples of how the workshop contributed to ways their **thinking** about ocean science education changed. Examples included 1) thinking that there was more hope for the oceans as a result of learning about the many efforts going on around the world, 2) linking what is going on in ocean science with educators who can get the message out, 3) thinking and acting more globally in ocean science education, 4) improving ocean science education globally, and 5) thinking about how to link ocean science with ocean science education with ocean literacy with ocean science literacy with pedagogy.

4. Sixteen respondents provided examples of how the workshop contributed to ways their **attitude** changed about ocean science education. Examples included 1) being more enthused and optimistic, 2) needing to avoid a "colonial mindset," and 3) needing to work together globally.

B. Evaluator's Recommendations Concerning Improvement of the Impact of the Next Workshop

1. Compile a list of resources for educators who wish to improve ocean science education and literacy for those with whom they come into contact. The list should be divided into types of audiences: elementary, secondary, higher education, and public.

2. Before the next workshop, follow-up with the participants from this workshop to ascertain impacts over a longer time period.

3. In the next workshop, design some private and group reflection time that focuses on how each participant can impact global ocean education in four areas: knowledge, behavior, thinking, and attitude.

4. Suggestions for the next Global Ocean Science Education Workshop:

Fifteen respondents made suggestions for the next Global Ocean Science Education Workshop (Question 17). They are listed below:

1. The international component was great, but it really brought to attention the fact that we have a considerable number of resources and support in the US (COSEE, NSF, etc) so we ended up discussing how other countries could link up with our resources, rather than talking about potential collaborations.
2. Perhaps hold it in a really EASY place to get to? More advance planning and marketing.
3. Hire a facilitator. Don't try to tackle so many issues in one meeting. I still have no idea why the hurricane researcher was included on the agenda. Interesting work, but he made no effort at connecting it to the topic of the workshop.
4. Keep working and networking between workshops.
5. Perhaps add another day or a field trip locally to share knowledge and expertise
6. Perhaps incorporate concurrent seminars.
7. The next agenda needs to focus more on action and planning.
8. The least developed and less aware maritime countries regarding the ocean education and research should be given priority to be taken in action where national or governmental initiatives are no more or inadequate.
9. I would have liked to have left with a definitive document that had resources.
10. a. Seek funding to involve a broader international audience (cover travel costs). b. Expand diversity of audience - youth representatives, marine industries. c. Continue to work towards making discussion groups focus on the global scene.
11. Partner with UNESCO.
12. I would try to do a virtual conference to include more participants from around the world.
13. More international participants, policy/decision makers need to attend.
14. I would love to see more K-12 educators represented. Most were local teachers like myself. I think we need to look beyond RI, and even US to attract a more diverse group.
15. something related to differentiating b/w ocean science, ocean science education, ocean literacy and ocean science literacy . . . I would like to have a published document about this come out of the next workshop.

A. Evaluator's Conclusions about Suggestions for the Next Global Ocean Science Education Workshop

1. Additional effort should be made to include more international participants (suggestions #1,2,8,10,12,13,and 14).

2. The planning for the next workshop should emphasize long-term networking, distribution of a resource document, and partnering with existing world-wide global education efforts such as UNESCO (suggestions #4, 9, and 11).

3. Four suggestions were made to improve the organization of the next workshop: hire a facilitator, add a local field trip, have concurrent seminars, and differentiate among ocean science, ocean science education, and ocean science literacy (suggestions #3, 5, 6, and 15).

B. Evaluator's Recommendations Concerning Suggestions for the Next Global Ocean Science Education Workshop

1. Attempt to partner with an existing organization that focuses on ocean science education in order to attract more international participation.

2. Provide a resource manual and glossary of key terms that will be used to facilitate workshop discussions.

Appendix 1: Survey Instrument (PDF)



Global Ocean Science
Education Workshop I

Appendix 2: Survey Results by Question (PPT)



Appendix 3: Listing of All Conclusions and Recommendations

A. Evaluator's Conclusions

Evaluator's Conclusions Concerning Demographic Mix of Past Workshop

1. The vast majority of participants were from North America, although a surprising number came from other parts of the world given that the workshop was held in New England.
2. There was a good mix of ocean science researchers and ocean science educators.

Evaluator's Conclusions Concerning Quality of the Past Workshop

1. The goals of the workshop were seen as appropriate. More work could be done to demonstrate different educational technologies.
2. The workshop was well designed and implemented. The various activities from presentations to group work to panels were all rated as clearly presented and contributing to the achievement of the four goals of the workshop.

Evaluator's Conclusions Concerning the Impact of the Past Workshop

1. Twenty respondents provided examples of how their *knowledge* changed as a result of attending the workshop. The examples can be generally grouped into two areas: 1) increased knowledge about key issues and resources (1, 3, 10, 19); 2) increased knowledge of international efforts and potential for international collaboration (2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20).

2. Fourteen respondents listed examples of how their **behavior** has changed as a result of attending the workshop. The examples included: 1) modifying their organization's strategic plan to include promoting citizen science projects, 2) recommending to others resources and tools obtained from the workshop, 3) starting a public movement to develop a mid high school curriculum for our students in Bangladesh, 4) running more local programs on ocean education, and 5) using my new knowledge to be part of an educator review team for a new marine science textbook.

3. Sixteen respondents provided examples of how the workshop contributed to ways their **thinking** about ocean science education changed. Examples included 1) thinking that there was more hope for the oceans as a result of learning about the many efforts going on around the world, 2) linking what is going on in ocean science with educators who can get the message out, 3) thinking and acting more globally in ocean science education, 4) improving ocean science education globally, and 5) thinking about how to link ocean science with ocean science education with ocean literacy with ocean science literacy with pedagogy.

4. Sixteen respondents provided examples of how the workshop contributed to ways their **attitude** changed about ocean science education. Examples included 1) being more enthused and optimistic, 2) needing to avoid a "colonial mindset," and 3) needing to work together globally.

Evaluator's Conclusions about Suggestions for the Next Global Ocean Science Education

Workshop

1. Additional effort should be made to include more international participants (suggestions #1,2,8,10,12,13,and 14).
2. The planning for the next workshop should emphasize long-term networking, distribution of a resource document, and partnering with existing world-wide global education efforts such as UNESCO (suggestions #4, 9, and 11).
3. Four suggestions were made to improve the organization of the next workshop: hire a facilitator, add a local field trip, have concurrent seminars, and differentiate among ocean science, ocean science education, and ocean science literacy (suggestions #3, 5, 6, and 15).

B. Evaluator's Recommendations

Evaluator's Recommendations Concerning Demographics Mix of Next Workshop

1. The organizers of the next workshop should continue to strive to attract participants from around the world, as participants found international ocean science education perspectives extremely helpful. Finding an outside sponsor to help fund the travel expenses of a future workshop is recommended. Running the workshop virtually is another option to increase international participation.

Evaluator's Recommendations Concerning Improvement of Quality of the Next Workshop

1. Continue with a mix of presentations, group work, and panels in the next workshop as they were well received by the past participants.

2. Given the cost and difficult logistics in holding a face-to-face follow-up workshop, explore conducting a series of future workshops using a webinar format.

Evaluator's Recommendations Concerning Improvement of the Impact of the Next Workshop

1. Compile a list of resources for educators who wish to improve ocean science education and literacy for those with whom they come into contact. The list should be divided into types of audiences: elementary, secondary, higher education, and public.
2. Before the next workshop, follow-up with the participants from this workshop to ascertain impacts over a longer time period.
3. In the next workshop, design some private and group reflection time that focuses on how each participant can impact global ocean education in four areas: knowledge, behavior, thinking, and attitude.

Evaluator's Recommendations Concerning Suggestions for the Next Global Ocean Science Education Workshop

1. Attempt to partner with an existing organization that focuses on ocean science education in order to attract more international participation.
2. Provide a resource manual and glossary of key terms that will be used to facilitate workshop discussions.