

Papahānaumokuākea Marine National Monument
EDUCATION Permit Application

NOTE: *This Permit Application (and associated Instructions) are to propose activities to be conducted in the Papahānaumokuākea Marine National Monument. The Co-Trustees are required to determine that issuing the requested permit is compatible with the findings of Presidential Proclamation 8031. Within this Application, provide all information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Papahānaumokuākea Marine National Monument (Monument).*

ADDITIONAL IMPORTANT INFORMATION:

- Any or all of the information within this application may be posted to the Monument website informing the public on projects proposed to occur in the Monument.
- In addition to the permit application, the Applicant must either download the Monument Compliance Information Sheet from the Monument website OR request a hard copy from the Monument Permit Coordinator (contact information below). The Monument Compliance Information Sheet must be submitted to the Monument Permit Coordinator after initial application consultation.
- Issuance of a Monument permit is dependent upon the completion and review of the application and Compliance Information Sheet.

INCOMPLETE APPLICATIONS WILL NOT BE CONSIDERED

Send Permit Applications to:

Papahānaumokuākea Marine National Monument Permit Coordinator

6600 Kalaniana'ole Hwy. # 300

Honolulu, HI 96825

nwhipermit@noaa.gov

PHONE: (808) 397-2660 FAX: (808) 397-2662

SUBMITTAL VIA ELECTRONIC MAIL IS PREFERRED BUT NOT REQUIRED. FOR ADDITIONAL SUBMITTAL INSTRUCTIONS, SEE THE LAST PAGE.

Papahānaumokuākea Marine National Monument Permit Application Cover Sheet

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

Summary Information

Applicant Name: Judith Lemus

Affiliation: Hawaii Institute of Marine Biology

Permit Category: Education

Proposed Activity Dates: July - Sept, 2012

Proposed Method of Entry (Vessel/Plane): Hi'ialakai RV

Proposed Locations: Nihoa/Necker; French Frigate Shoals; Gardner; Maro; Laysan; Lisianski; Pearl and Hermes; Midway; Kure

Estimated number of individuals (including Applicant) to be covered under this permit: 2

Estimated number of days in the Monument: 25

Description of proposed activities: (complete these sentences):

a.) The proposed activity would...
develop the multimedia resources needed for a distance learning course offered to University of Hawai'i undergraduates. It would also provide needed visual media for existing outreach and education programs such as the marine exchange program Ecosystem Penpals, and updated photographs for important research reports and other related materials.

b.) To accomplish this activity we would
conduct interviews with research scientists during the course of their field work, and film (still photography and video) both the natural resources under study and the scientists conducting the studies. Additionally, we intend to link to several schools offering opportunities for direct interactions between students and scientists working in the Monument. The PIs will connect with students via e-mail, and satellite phone. Pre-arranged Hawaii teachers will work with students to email questions daily to the researchers who will respond via email and at one set interview time via phone. Photographs will also be sent periodically to the participating teachers.

c.) This activity would help the Monument by ...

providing a much broader spectrum of the academic community (namely undergraduate students) an opportunity to learn about and better understand the NWHI and Papahānaumokuākea. The online course would provide a window into Papahānaumokuākea Marine National Monument for future scientists in Hawaii who might not otherwise have an opportunity to experience the science of this rich and important ecosystem, enhancing the conservation and education capacity of the Monument. This fulfills the direct mandate of the Monument to bring the place to the people. This activity would also build upon existing and successfully proven outreach programs and further develop materials for informal and formal education. The program emphasis will be on grades 4-6 but can be formatted to other grades and ages. State of Hawaii DOE standards and National standards will be addressed for Grades four through six. In addition, Lemus and Wiener will work with PMNM education staff Andy Collins, Wesley Byers, and Matt Limtiaco to inform them of program progress and outcomes, as well as provide access to content. We would also welcome their feedback on the overall course outline.

Other information or background: The principals on this permit both have extensive experience developing marine science curricula and university-level courses. Dr. Lemus is a trained marine biologist and has taught marine biology courses at both the undergraduate and graduate levels. Carlie Wiener also has had extensive experience working with the management of Papahānaumokuākea as the outreach and research specialist for the HIMB partnership. At the tenth anniversary of the designation of the Northwest Hawaiian Islands Coral Reef Ecosystem Reserve, the managers stated that it is time to share the wonder of the place and the exemplary scientific research that serves as the model for effective science-management collaboration. The proposed course, "Science and Management of the Northwest Hawaiian Islands" would engage students in a virtual exploration of the islands, their flora and fauna, and the science that is being used to better understand and manage the ecosystem. Potential course topics include: Coral Reef Habitats; Comparison of MHI and NWHI Ecosystems; Marine Ecology Field Techniques; Population Genetics; Ecological Genomics; Overview of Marine Management History and Strategies; Papahānaumokuākea Management Objectives and Strategies; Ecosystem-based Management; What can the Science Tell Us?; Collaborations among Scientists, Cultural Practitioners and Managers; Applications and Extrapolations to other Pacific MPAs. The importance of this place historically and culturally will be integrated into course content. Dr. Lemus has been working with colleagues in ocean sciences, education, and Hawaiian studies, to integrate traditional knowledge and ways of knowing into courses that teach educators how to more effectively communicate about ocean sciences. Through the NSF Centers for Ocean Sciences Education Excellence effort in Hawaii, Dr. Lemus recently (June 4-5, 2011) organized a two-day workshop in Hilo that focused on integrating Western and Hawaiian modes of inquiry into science instruction.

This class will also tie into the already existing Papahānaumokuākea community education course "Moku o Lo'e: The Best Kept Secret in Kane'ohe Bay". This course has been running for eight semesters and has shared the science and beauty of the NWHI with over 200 participants. The course will continue to share the unique research coming out of the Monument with the community, but after eight semesters is in need of course revision and fresh material. Having the ability to document new research, obtain photo and video footage and gather collective

experiences will help to formulate new curriculum not only for the two above mentioned classes but for other outreach and education programs as well.

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Lemus, Judith, D.

Title: Specialist

1a. Intended field Principal Investigator (See instructions for more information):

Judith Lemus, Ph.D. (CV attached)

2. Mailing address (street/P.O. box, city, state, country, zip):

[REDACTED]

Phone:

[REDACTED]

Fax:

[REDACTED]

Email:

[REDACTED]

For students, major professor's name, telephone and email address:

3. Affiliation (institution/agency/organization directly related to the proposed project):

University of Hawaii, Hawai'i Institute of Marine Biology

4. Additional persons to be covered by permit. List all personnel roles and names (if known at time of application) here (e.g. John Doe, Teacher; Jane Doe, Videographer):

Carlie Wiener, education specialist (CV attached)

Sherril Leon Soon, graduate student, project assistant

Megan Onuma, project assistant

Mackenzie Manning, community college instructor, project assistant

Section B: Project Information

5a. Project location(s):

<input checked="" type="checkbox"/> Nihoa Island	<input checked="" type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Necker Island (Mokumanamana)	<input checked="" type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> French Frigate Shoals	<input checked="" type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Gardner Pinnacles	<input checked="" type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Maro Reef			
<input checked="" type="checkbox"/> Laysan Island	<input checked="" type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Lisianski Island, Neva Shoal	<input checked="" type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Pearl and Hermes Atoll	<input checked="" type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Midway Atoll	<input checked="" type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input checked="" type="checkbox"/> Kure Atoll	<input checked="" type="checkbox"/> Land-based	<input checked="" type="checkbox"/> Shallow water	<input type="checkbox"/> Deep water
<input type="checkbox"/> Other			

Ocean Based

NOTE: There is a fee schedule for people visiting Midway Atoll National Wildlife Refuge via vessel and aircraft.

Location Description:

5b. Check all applicable regulated activities proposed to be conducted in the Monument:

- Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving Monument resource
- Drilling into, dredging, or otherwise altering the submerged lands other than by anchoring a vessel; or constructing, placing, or abandoning any structure, material, or other matter on the submerged lands
- Anchoring a vessel
- Deserting a vessel aground, at anchor, or adrift
- Discharging or depositing any material or matter into the Monument
- Touching coral, living or dead
- Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument
- Attracting any living Monument resource
- Sustenance fishing (Federal waters only, outside of Special Preservation Areas, Ecological Reserves and Special Management Areas)
- Subsistence fishing (State waters only)
- Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

6 Purpose/Need/Scope *State purpose of proposed activities:*

The purpose is to provide a large number of undergraduate science students an opportunity to learn about the the natural history, and the science and management activities in the NWHI through a visually rich virtual education experience. The distance learning course will initially be offered through the University of Hawai'i in the fall of 2013, and bi-annually thereafter. The project will also update the existing NWHI Research Partnership photo and video catalogue that will be used for several outreach programs which focus on marine science and the Monument with local students around the state. As a large scale marine protected area and World Heritage Site, the NWHI have the capacity to teach not only our local students but others across the United States and internationally about the important natural and cultural history of these ecosystems. Using the NWHI as a teaching tool we are able to instill a conservation ethic towards the marine environment across numerous age ranges and cultures. Although we have had six years of research expeditions in the Monument, our visual media resources are limited because scientists cannot take the time to collect images while focuses on their extremely busy research agendas. Outreach specialists can obtain engaging footage without disrupting the research schedule on the cruise. Our education experience also allows us to understand the type of video and photo needed to produce dynamic reports and education products that will engage students and community.

7. Answer the Findings below by providing information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Monument:

The Findings are as follows:

a. How can the activity be conducted with adequate safeguards for the cultural, natural and historic resources and ecological integrity of the Monument?

The nature of the activities of this project are purely observational and non-invasive. While benthic organisms (including dead coral, but not live coral) may be picked up for photography, they will be replaced in the same location. All photography would be

conducted in situ, and all pieces would be returned to their original position after photographing. No specimens of any kind would be removed from their natural environment. Working as a team, we will use the utmost care while photographing natural resources, with one person being assigned camera duties and the other serving as a tender to insure there is no damage to those resources. We recognize how special Papahānaumokuākea is and are committed to only using non invasive techniques such as photo and video to bring this special place to the public and to enhance our education programs.

b. How will the activity be conducted in a manner compatible with the management direction of this proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument cultural, natural and historic resources, qualities, and ecological integrity, any indirect, secondary, or cumulative effects of the activity, and the duration of such effects? The activities are entirely compatible with the management direction in that they will not diminish the resources in any way, and in fact will enhance the management capacity of the Monument by providing virtual access and education to Hawaii college students and the general public. This activity will also aid in enhancing public knowledge and understanding about the Papahānaumokuākea Marine National Monument and the Northwestern Hawaiian Islands through outreach materials. These materials are disseminated to broad audiences including the general public and communities at local events, students through community college courses and workshops, the media, and Hawaii's students through formal school presentations. Some of these materials will include curriculum and classroom activities centered around both the scientific and cultural importance of the Northwestern Hawaiian Islands, tailoring existing curriculum for the Windward Community College course on the science of the Northwestern Hawaiian Islands to include more up-to-date images, information, and science about Papahānaumokuākea Marine National Monument, and the development of informational materials and training for local journalists and journalism students as a mechanism for further dissemination of information about Papahānaumokuākea Marine National Monument. Fostering personal connections to the Monument through virtual

experiences will directly support the Monument's aim of bringing the “place to the people”, and help engender an ethic of environmental stewardship.

c. Is there a practicable alternative to conducting the activity within the Monument? If not, explain why your activities must be conducted in the Monument.

The principles will work with researchers who have previously worked in the Monument to obtain additional photographic and videographic footage for use in the course, and will also request access to the large Monument image database. But to provide a dynamic and engaging learning experience we feel it is important to interview and photograph scientists as they conduct their work in the field (and on the ship). If possible, narrated walking and snorkeling/diving tours of some islands would also significantly enrich the course content. If available, PIs would like to request a tour of Midway and/or Tern Island with USFWS staff (but this is not a compulsory aspect of our activities). Additionally, we will be connecting with students in real time which requires a presence on the ship not only to demonstrate the importance of the science but to connect students to future marine science and conservation careers. The images we are seeking require "in the moment" science shots observing researchers in the field. Previous photos in the database are mostly scenery shots and do not capture the most up to date research and new projects.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?

The end value of the proposed activity will be only to educate future scientists and resource managers about the unique ecosystem of the NWHI and the science that helps support its management. Through this type of pre-career training in scientific and management processes and techniques, the cultural, natural and historic resources, and ecological integrity of the NWHI, we can help to broaden the impact of the conservation objectives of the Monument. An added value will be enhanced public outreach capacity with visually engaging resources.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.

The activities will last for the duration of the scheduled cruise in either July, August or September, 2012. We are requesting to participate on a research cruise (instead of an education cruise) so that we may obtain video and photographic footage of actual researchers conducting scientific investigations in the Monument.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

Dr. Lemus is an experienced marine biologist and science education specialist that has utilized multimedia resources (including photos, video, and web-based products) in a variety of ocean science education programs, including undergraduate and graduate courses, teacher professional development, and high school student field courses.

Example courses/programs include:

Communicating Ocean Sciences (OEST 696)

UH Manoa Ocean and Earth Sciences and Technology, Co-Instructor

The Role of Marine Protected Areas in Ecosystem Based Management (OEST 699)

UH Manoa Ocean and Earth Sciences and Technology, Creator and Lead Instructor

Communicating Ocean Sciences to Informal Audiences (BISC 599)

University of Southern California Biological Sciences, Lead Instructor

Oceanography of the Southern California Bight (CORE 195)

USC Summer Seminar, Creator and Lead Instructor

Fundamentals of Biology (Biology 3)

Santa Monica College, Lead Instructor

Field Program in Galapagos: Ecology and Evolution (CORE 195)

USC Summer Seminar, Creator and Lead Instructor

Oceanography of the Southern California Bight (CORE 195)

USC Summer Seminar, Creator and Lead Instructor

Science Teacher Professional Development - online and in-person workshops

USC Center for Ocean Sciences Education Excellence, Designer and Instructor

Carlie Wiener is also an experienced education specialist who has worked on the subject of the Northwestern Hawaiian Islands since 2006. She is involved in several outreach projects related to the NWHI including the Ocean FEST (Families Exploring Science Together) state-wide inter-generational program and Ecosystem PenPals, a natural and cultural Pacific-wide exchange program. She also develops annual reports and assorted

outreach materials including websites, postcards, newsletters and education curriculum related to NWHI and science activities.

g. Provide information demonstrating that you have adequate financial resources available to conduct and complete the activity and mitigate any potential impacts resulting from its conduct. This activity will require minimal equipment and resources other than photographic and recording equipment, which will be supplied by the principle investigators. Berths on the Hi'ialakai are provided as part of the HIMB NWHI Research Partnership with NOAA. University of Hawai'i is self-insured and the activities of both principles are covered under this policy.

h. Explain how your methods and procedures are appropriate to achieve the proposed activity's goals in relation to their impacts to Monument cultural, natural and historic resources, qualities, and ecological integrity.

As stated above, the activities will be purely observational and no cultural, natural or historic resources will be disturbed. Images and interviews of scientists conducting research are essential to helping university science students understand science designed to inform ecosystem-based management efforts. Furthermore, the activities and products will help to educate a broader audience about science efforts that support the ecological integrity of the Monument with emphasis on our local students in Hawaii. We continually evaluate the quality of all of our programs through formative and summative evaluation methods. Both student feedback and formalized course evaluations are always included. Assessment measures are a required component of university courses, and will be developed in conjunction with the course proposal. Specific evaluation criteria would include assessments of mastery of course content, participation, thoroughness, and synthesis. Student evaluations of courses and instructors will also be included. Typical evaluation elements include: overall course value; instructor preparedness; instructor effectiveness,; effectiveness and value of course readings, resources and media; perceived (self-assessed) learning; and others related to the online experience.

i. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?

NA

j. Demonstrate that there are no other factors that would make the issuance of a permit for the activity inappropriate.

NA

8. Procedures/Methods:

Photos and video will be taken aboard the ship during preparation of research activities. Video interviews with scientists will also be conducted during this time. Photos and video will also be taken in the field to capture images of research activities and subjects, and to continue interview elements. These may be taken either on land, by snorkeling, SCUBA, or as the scientists conduct their processing and analyses of samples on the ship. We will work within the schedule of the chief scientist and researchers to capture interviews and video whenever and wherever is most convenient. Any of these venues (ship, water, land) would make for educationally rich content. Additionally, by pre-recording events while at sea, we have the added ability to share these images and videos with classroom visits once back on land. Students will be able to get a feel for what it is like to be on a ship, what goes on, and how the research is conducted. Post-cruise classroom visits will help to enhance previous communication while on the ship. Dr. Lemus has advanced open water and rescue diver certifications, as well as underwater photography certification. Ms. Wiener has her advanced open water, scientific diver, and underwater photography certification. Communication with teachers and school programs may also be carried out throughout the trip, and continue upon returning from the Monument. Various activities and programs may also be developed from the information and image collections gathered on this trip. Although both principles have lapsed scientific diver certifications, we plan to undergo reinstatement before the cruise. If for some reason this is not possible, we will conduct our activities via land, boat, and snorkel. Videos and images will be collected using hand-held digital cameras. Audio will be recorded with an external (clip-on) wireless microphone. We are also considering the use of an integrated helmet camera with microphone for underwater video and audio that can be used by scientists during research dives, or by

PIs during snorkeling. Images can be saved in a variety of formats (jpg, eps, psd, tif) for sharing with PMNM. Specific formats used for the course will depend on compatibility with the UH online course management system (Laulima).

NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding, as a customized application will be needed. For more information, contact the Monument office on the first page of this application.

9a. Collection of specimens - collecting activities (would apply to any activity): organisms or objects (List of species, if applicable, attach additional sheets if necessary):

None

Common name:

Scientific name:

& size of specimens:

Collection location:

Whole Organism Partial Organism

9b. What will be done with the specimens after the project has ended?

9c. Will the organisms be kept alive after collection? Yes No

• Specific site/location:

• Is it an open or closed system? Open Closed

• Is there an outfall? Yes No

• Will these organisms be housed with other organisms? If so, what are the other organisms?

- Will organisms be released?

10. If applicable, how will the collected samples be transported out of the Monument?

NA

11. Is your proposed activity based on a State Department of Education Standards Based Curriculum? If so, describe:

The program emphasis will be on grades 4-6 but can be formatted to other grades and ages. State of Hawaii DOE standards and National standards will be addressed for Grades four through six. The following are some of the math, science and social studies standards and benchmarks from the Hawai'i Content & Performance Standards (HCPS III) that this program will address:

Math Standard 11: Data Analysis, Statistics, and Probability: FLUENCY WITH DATA: Pose questions and collect, organize, and represent data to answer those questions.

Grade 3 Benchmarks for Math:

Benchmark MA.3.11.1 Pose questions, collect data using surveys, and organize the data into tables and graphs.

Grade 4 Benchmarks for Math:

Benchmark MA.4.11.1 Pose questions, collect data using observations and experiments, and organize the data into tables or graphs.

Science Standard 1: The Scientific Process: SCIENTIFIC INVESTIGATION: Discover, invent, and investigate using the skills necessary to engage in the scientific process.

Grade 3 Benchmarks for Science:

Benchmark SC.3.1.1 Pose a question and develop a hypothesis based on observations.

Benchmark SC.3.1.2 Safely collect and analyze data to answer a question.

Grade 4 Benchmarks for Science:

Benchmark SC.4.1.1 Describe a testable hypothesis and an experimental procedure.

Grade 5 Benchmarks for Science:

Benchmark SC.5.1.1 Identify the variables in scientific investigations and recognize the importance of controlling variables in scientific experiments.

Benchmark SC.5.1.2 Formulate and defend conclusions based on evidence.

Grade 6 Benchmarks for Science:

Benchmark SC.6.1.1 Formulate a testable hypothesis that can be answered through a controlled experiment.

Benchmark SC.6.1.2 Use appropriate tools, equipment, and techniques safely to collect, display, and analyze data.

Science Standard 2: The Scientific Process: NATURE OF SCIENCE: Understand that science, technology, and society are interrelated.

Grade 5 Benchmarks for Science:

Benchmark SC.5.2.1 Use models and/or simulations to represent and investigate features of objects, events, and processes in the real world.

Science Standard 4: Life and Environmental Sciences: STRUCTURE AND FUNCTION IN ORGANISMS: Understand the structures and functions of living organisms and how organisms can be compared scientifically.

Grade 3 Benchmarks for Science:

Benchmark SC.3.4.1 Compare distinct structures of living things that help them to survive.

Science Standard 5: Life and Environmental Sciences: DIVERSITY, GENETICS, AND EVOLUTION: Understand genetics and biological evolution and their impact on the unity and diversity of organisms.

Grade 3 Benchmarks for Science:

Benchmark SC.3.5.1 Describe the relationship between structure and function in organisms.

Grade 4 Benchmarks for Science:

Benchmark SC.4.5.3 Describe how different organisms need specific environmental conditions to survive.

Social Studies Standard 7: Geography: WORLD IN SPATIAL TERMS-Use geographic representations to organize, analyze, and present information on people, places, and environments and understand the nature and interaction of geographic regions and societies around the world.

Grade 3 Benchmarks for Social Studies:

Benchmark SS.3.7.4 Examine the ways in which people modify the physical environment and the effects of these changes.

12. If applicable, describe how you are collaborating with others in any way to reduce duplicative activities in the Monument or elsewhere?

We will be working with scientists that have previously worked in the Monument to obtain additional photographic and video footage. This approach has not been completed by others in the past few years and a gap in the imagery reflecting new research and programs exists. This work will be shared with other education programs both in Hawaii and abroad for use in several outreach programs including Ocean FEST, Ecosystem PenPals, The HIMB Community Education Program, the proposed UH NWHI course, Windward Community College continuing education course, Hawaii Environmental Education Association, the NSF Centers for Ocean Science Education Excellence network, amongst other programs.

13. What materials, products or deliverables will be developed as a result of your proposed activity? Provide a time line for write-up and publication of information or production of educational materials:

This activity will create a visual database of photographic and video images of science being conducted in the Monument. It will also add to the existing database of images of the natural resources in the Monument. Images will be catalogued according to date, location and subject and the PIs will comply with any protocols provided by the Monument for metadata and logging. Video interview vignettes of scientists will help develop educational stories of what scientists do and how their work can help to support management objectives. Multimedia footage will be used to develop an undergraduate distance learning (online) course offered through UH in Fall 2013. It will also be integrated into the existing continuing education course at Windward Community College. Public outreach and education materials generated at HIMB will also be much enhanced with images of scientists and the science being conducted in PMNM. Photos and video will also be made available to the Monument. Direct application to new activities and expansion of existing programs like the Ocean FEST and Ecosystem Penpals program will also be included.

Timeline:

Fall 2012 - Draft "Science and Mangement of the Northwest Hawaiian Islands" online course curriculum and submit to UHM Dept. of Oceanography for approval; HIMB NWHI Semi-annual report publication with new photographs obtained during cruise; WCC continuing education course offered, using newly obtained media; Ocean FEST and Ecosystem penpal programs continue using new media.

Spring 2013 - "Science and Mangement of the Northwest Hawaiian Islands" course curriculum finalized and advertized to UH students; HIMB NWHI Semi-annual report publication; WCC continuing education course; Catalog of photos, interviews, and videos made available to PMNM; Ocean FEST and Ecosystem penpal programs.

Summer 2013 - "Science and Mangement of the Northwest Hawaiian Islands" course website developed for Laulima online learning environment.

Fall 2013 - "Science and Mangement of the Northwest Hawaiian Islands" online course offered; HIMB NWHI Semi-annual report publication; WCC continuing education course; Ocean FEST and Ecosystem penpal programs.

14. List all specialized gear and materials to be used in this activity:

Underwater camera; underwater video camera; underwater full face mask with microphone

15. List all Hazardous Materials you propose to take to and use within the Monument:

Rechargeable batteries for cameras

16. Describe any fixed installations and instrumentation proposed to be set in the Monument:

None

17. List all Applicants' publications/references directly related to the proposed project:

Lemus, J. (2010) Applied Ocean Studies BAS Degree Program; Two-year upper division curriculum at UH Maui College.

Lemus, J. and Duncan, K. (2009) Communicating Ocean Sciences; Graduate course at UH Manoa.

Lemus, J. (2008) Ecosystem-based Management; Graduate special topics seminar at UH Manoa.

Lemus, J. (2004-2007) Centers for Ocean Sciences Education Excellence (COSEE-West) Online Teacher Professional Development workshops.

Lemus, J. D., A. Read, A. Knight, H. Havens, J. Mooney, S. Teck, E. Franklin, M. Chow, J. Lindholm, A. Rosenberg, L. Abramson, B. Barr, C. Benson, E. Brody, K. Carvalho, C. Combest-Friedman, J. Dupont, K. Emery, D. Fluharty, B. Halpern, J. Johnson, S. Katz, B. Keller, J. Kerr, E. Klein, E.S. Rutherford, R. Warner, R. Pavia (in prep). Marine Ecosystem-based Management Course Guide. Journal of Geoscience Education.

Kittinger, J.N., D.J. Skillings, K.K. Carvalho, L.L.N. Reeve, M. Hutchinson, J. O'Malley, K. Cullison, J. Shackeroff, M. Chow, and J. Lemus (2009). Reconciling Ecosystem-Based Management and Focal Resource Conservation in the Papahānaumokuākea Marine National Monument. Marine Sanctuaries Conservation Series ONMS-09-04. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD.

Wiener, C. (2008-2010) Secrets of Moku o Loe; Continuing education course at UH Windward Community College.

Wiener, C.S., B. C. Bruno. J. Fooley. (2011). Ocean investigators: Learning to monitor coral reefs using quadrats. Green Teacher Special Issue: Marine Education. (In press).

Wiener, C.S., M.A. Rivera., R.J. Toonen., et al. (2010). Creating Effective Partnerships in Ecosystem Based Management: A Culture of Science and Management. Journal of Marine Biology.

Wiener, C.S., & M.A. Rivera. (2010). Journeying through the Hawaiian Archipelago: Using marine science and place-based learning at the Hawai'i Institute of Marine Biology. Current: The Journal of Marine Education 26 (4).

Bruno, B. C. & C.S. Wiener. (2010). Ocean FEST: Families Exploring Science Together. Journal of Geoscience Education: 14 pages.

Wiener, C.S. & M.O. Lammers. (2010). Sound and observation: Listening for clues using real life acoustic recorders. American Biology Teacher 72 (6), 365-368.

With knowledge of the penalties for false or incomplete statements, as provided by 18 U.S.C. 1001, and for perjury, as provided by 18 U.S.C. 1621, I hereby certify to the best of my abilities under penalty of perjury of that the information I have provided on this application form is true and correct. I agree that the Co-Trustees may post this application in its entirety on the Internet. I understand that the Co-Trustees will consider deleting all information that I have identified as “confidential” prior to posting the application.

Signature

Date

**SEND ONE SIGNED APPLICATION VIA MAIL TO THE MONUMENT OFFICE
BELOW:**

Papahānaumokuākea Marine National Monument Permit Coordinator
6600 Kalaniana'ole Hwy. # 300
Honolulu, HI 96825
FAX: (808) 397-2662

DID YOU INCLUDE THESE?

- Applicant CV/Resume/Biography
- Intended field Principal Investigator CV/Resume/Biography
- Electronic and Hard Copy of Application with Signature
- Statement of information you wish to be kept confidential
- Material Safety Data Sheets for Hazardous Materials

JUDITH DOINO LEMUS, PH.D.

University of Hawai'i at Manoa, Hawai'i Institute of Marine Biology



EDUCATION:

- PH.D. UNIVERSITY OF SOUTHERN CALIFORNIA, BIOLOGICAL SCIENCES, 1998
Advisor: Dr. Margaret McFall-Ngai
The Role of Light Organ Symbionts in Signaling Early Morphological and Biochemical Events in a Hawaiian Sepiolid Squid
- M.A. UNIVERSITY OF CALIFORNIA LOS ANGELES, BIOLOGY, 1993
Advisor: Dr. Len Muscatine
Low Temperature Acclimation in the Sub-Tropical Sea Anemone *Aiptasia pulchella* (Carlgren)
- B.S. UNIVERSITY OF CALIFORNIA LOS ANGELES, BIOLOGY, 1988

PROFESSIONAL HISTORY:

FEBRUARY 2008 – PRESENT
Hawai'i Institute of Marine Biology
University of Hawai'i at Manoa
Kaneohe, HI

ASSOCIATE SPECIALIST

Design and administration of academic program initiatives and curricula in tropical marine research and education. Creation and administration of HIMB internship programs with federal, state and local agencies. Development of professional enhancement programs and materials for students, early-career scientists, and Pacific region resource agencies.

JUNE 2006 – JAN 2008
MARCH 2004 – JAN 2008
Department of Biological Sciences &
Wrigley Institute for Environmental
Studies
University of Southern California
Los Angeles, CA

RESEARCH ASSISTANT PROFESSOR DIRECTOR OF EDUCATION

Development and design of university-based outreach and education programs. Directed and managed all pre-college and teacher (K-12) education programming at the Institute. Directed NSF COSEE-West program (Centers for Ocean Sciences Education Excellence, a National Science Foundation initiative to enhance connections between ocean sciences and public education). Directed science field programs for students and families at the Wrigley Marine Science Center on Catalina Island. Developed new and innovative programs for K-12 education and teacher training. Created and instructed marine science university courses for graduate students, teachers, and high school students

OCT 1998 – MARCH 2004

Sea Grant Program
University of Southern California

MARINE ADVISORY PROGRAM LEADER

Directed professional and public outreach for transfer of research-based information and technologies related to the marine environment. Acted as science liaison between university scientists and lay audiences, including resource managers, policy makers, NGOs, educators, and the general public. Supervised Education program. Content specialist and instructor for marine science curriculum. Science writing/communications. Oversaw graduate student trainee program. Developed proposals for additional funding and collaborative projects.

OCT 1996 – OCT 1998

Sea Grant Traineeship Program
University of Southern California

SCIENCE SPECIALIST

Content development of "Island Explorers" multidisciplinary marine science curriculum for grades 4-8, including design of interactive web-based learning activities; Instructor for Island Explorers student excursions and teacher training at Wrigley Marine Science Center on Catalina Island; Assistant to the Marine Advisory Services Leader.

JUNE 1996 – SEPT 1996

California Museum of Science and
Industry, Exposition Park
Los Angeles, CA

EXHIBIT CONSULTANT

Assistant to Dr. Diane Perlov, Special Exhibits Curator. Updated and modified information for portions of the "Our Urban Environment" exhibit as needed to comply with current data and scientific opinion.

JULY 1990

Bruin Kids Summer Camp
UCLA

MARINE BIOLOGY SUMMER CAMP TEACHER

Developed and taught activities pertaining to the marine environment for 7-10 yr. olds.

AUG 1988 – JULY 1989

West Indies Laboratory
Farleigh Dickenson University
St. Croix, USVI

LABORATORY SUPERVISOR

Developed and organized educational outreach program with local schools and public; Large and small boat operations; Assistant to the dive officer; Laboratory and field assistance to researchers; Maintenance of laboratories, classrooms, equipment, seawater tables and aquaria; Care of marine organisms at lab; Chemical inventory and waste management.

MAY 1988 – JULY 1988

Laboratory of Dr. Len Muscatine
University of California Los Angeles

RESEARCH TECHNICIAN

Study of the physiological responses of a subtropical anemone to low temperatures; Care and maintenance of seawater aquaria.

SEPT 1985 – MAY 88

Kathleen Boldy, DVM;
West L.A. Animal Hospital;

VETERINARY ASSISTANT

Care of animals; Administration of medications and injections; Assistance with technical procedures and

Conejo Valley Animal Clinic surgeries.

ACADEMIC HONORS:

DR. SUZANNE LAWRENZ-MILLER EDUCATION AWARD	2009
Cabrillo Marine Aquarium (Given to COSEE-West program) SEA GRANT TRAINEESHIP USC Sea Grant Program	1996-1997
ARCS SCHOLAR Achievement Rewards for College Scientists	1994-1996
GRADUATE RESEARCH FELLOW Office of Naval Research	1993-1994
BEST POSTER AWARD West Coast Developmental Biology Meeting	1993
OUTSTANDING TEACHING ASSISTANT AWARD Biological Sciences USC	1992
DEAN'S HONOR LIST UCLA	1986, 1987
FRESHMAN HONOR SOCIETY UCLA	1983

TEACHING EXPERIENCE:

COMMUNICATING OCEAN SCIENCES (OEST 696) UH Manoa Ocean and Earth Sciences and Technology	FALL 2009 CO-INSTRUCTOR
THE ROLE OF MARINE PROTECTED AREAS IN ECOSYSTEM BASED MANAGEMENT (OEST 699) UH Manoa Ocean and Earth Sciences and Technology	FALL 2008 CREATOR AND LEAD INSTRUCTOR
COMMUNICATING OCEAN SCIENCES TO INFORMAL AUDIENCES (BISC 599) University of Southern California Biological Sciences	SPRING 2007 LEAD INSTRUCTOR
OCEANOGRAPHY OF THE SOUTHERN CALIFORNIA BIGHT (CORE 195) USC Summer Seminar	SUMMER 2006 CREATOR AND LEAD INSTRUCTOR
FUNDAMENTALS OF BIOLOGY (BIOLOGY 3) Santa Monica College	SPRING 2005 LEAD INSTRUCTOR

FIELD PROGRAM IN GALAPAGOS:
ECOLOGY AND EVOLUTION (CORE 195)
USC Summer Seminar

SUMMER 2004
CREATOR AND LEAD INSTRUCTOR

OCEANOGRAPHY OF THE SOUTHERN
CALIFORNIA BIGHT (CORE 195)
USC Summer Seminar

SUMMER 2004
CREATOR AND LEAD INSTRUCTOR

TEACHER SCIENCE WORKSHOPS
USC Center for Ocean Sciences Education
Excellence

2002 – 2007
DESIGNER AND INSTRUCTOR
Coastal oceans, oceans and human health,
extreme environments, open ocean and coral
reefs.

INVITED LECTURES:

GRANT WRITING FOR GRADUATE
STUDENTS (BOT 698)
University of Hawaii at Manoa

SPRING 2010
“Enhancing your Broader Impacts in NSF
research proposals”

SCIENTIST-EDUCATOR PARTNERSHIP
PROGRAM
COSEE Coastal Trends

SUMMER 2010
“Inquiry in Science Education”

KANEOHE BAY NUTRIENT STUDIES
WORKSHOP
UH Manoa Oceanography Department

SUMMER 2010
“Laulima A ‘Ike Pono: Working Together for the
Collective Vision”

UH SEA GRANT ANNUAL MEETING
Hawaii Sea Grant College Program

SUMMER 2008
“Approaches and (*Some*) Ideas for Connecting
Science and Outreach”

ANIMATION & DIGITAL ARTS SEMINAR
(CTAN 522)
University of Southern California

FALL 2007
“Where do Science and Animation Intersect?
Examples of Visual Art in Science and Vice
Versa”

SCIENCE CAREER SYMPOSIUM
Turning Point School

SPRING 2007
“Marine Science Research and Education”

CONTEMPORARY TOPICS IN ANIMATION
AND DIGITAL ART (CTAN 524)
University of Southern California

FALL 2005
“Where do Science and Animation Intersect?”

RECENT ADVANCES IN MARINE SCIENCE
University of California at Los Angeles Extension

FALL 2003
“Symbiosis and Bioluminescence”

ECOLOGY University of California at Los Angeles	FALL 2003 “The Role of Symbiosis and Facilitation in Ecology”
MARINE BIOLOGY Palos Verdes High School	SUMMER 2003 “Squids and Bacteria: An illuminating story of symbiosis”
SEA EDUCATION AWARENESS SERIES Los Angeles Unified School District	SPRING 2002 “Coastal Habitats”
DEPARTMENT OF BIOLOGY SEMINAR SERIES New Mexico State University	SPRING 2001 “The Role of Light Organ Symbionts in Signaling Early Morphological and Biochemical Events in the Sepiolid Squid <i>Euprymna scolopes</i> ”
FRESHMAN BIOLOGY COLLOQUIUM University of Southern California	SPRING 1999, 2000, 2001 “Bioluminescent Symbioses” “Current Research at USC Sea Grant”
TEACHING ASSISTANTSHIPS:	
DEPT. OF BIOLOGICAL SCIENCES University of Southern California	1992 – 1996 Courses: Human Biology, Humans and the Environment, Advanced Molecular Biology, Biochemistry, Advanced Biochemistry, Physiology, Invertebrate Zoology, Marine Biology
DEPT OF BIOLOGY University of California Santa Barbara	1992 Courses: Introductory Biology
DEPT. OF BIOLOGY UCLA	1989 – 1991 Courses: Biology, Biology Laboratory, Marine Biology
GRADUATE SCIENCE TEACHING ASSISTANT ENHANCEMENT PROGRAM University of Southern California	OCT 1996 – JUNE 1997

RESEARCH EXPERIENCE:

2001 – 2007	SCIENCE COORDINATOR (WEST COAST)
GLOBAL HEARTBEAT	Environmental research and high school education initiative to investigate physiological responses to environmental stress in shore crabs (http://www.globalheartbeat.org)
2001 – 2003	PRINCIPAL INVESTIGATOR
NATIONAL SEA GRANT AQUATIC NUISANCE SPECIES INITIATIVE	Investigation of stress protein expression in strains of <i>C. taxifolia</i> that display a high degree of thermal tolerance
1992 – 1996	RESEARCH ASSISTANT
UNIVERSITY OF SOUTHERN CALIFORNIA	Biochemical interactions in a squid-luminous bacterium symbiosis
1991	RESEARCH ASSISTANT
UNIVERSITY OF CALIFORNIA AT SANTA BARBARA	Promoter gene expression in a Rhizobium-legume symbiosis
1988	RESEARCH ASSISTANT
UNIVERSITY OF CALIFORNIA AT LOS ANGELES	Physiological adaptation to thermal stress in symbiotic anemones

FUNDING AND FELLOWSHIPS:

- COSEE Island Earth. NSF Centers for Ocean Sciences Education Excellence. Co-PI: OCE1039352 (2011-2014) – Recommended for funding
- Restoration within the He‘eia Ahupua‘a: Effects on species diversity and water quality. Hawaii Coral Reef Initiative. Co-PI (2010-2011) - \$151,000 (\$55,000 to Lemus)
- EAGER: Building networks and study systems to advance research on the biology of Pacific corals. NSF EARly-concept Grants for Exploratory Research. Co-PI: OISE1042509 (2010-2013) - \$299,926
- Laulima A ‘Ike Pono: Community Collaborations in Geosciences and Place-based Education. NSF Opportunities for Enhancing Diversity in Geosciences. Lead PI: GEO09-14516 (2009-2012) - \$197,854
- Ocean FEST- Families Exploring Science Together. NSF Opportunities for Enhancing Diversity in Geosciences. Co-PI: GEO09-14317 (2009-2012) - \$197,278
- HIMB-NOAA Fellowship Program. NOAA National Marine Fisheries. Lead PI: NA10NMF4520216 (2010-2011) - \$38,000
- HIMB-NOAA Fellowship Program. NOAA National Marine Fisheries. Lead PI: NA09NMF4520249 (2009-2010) - \$38,000
- Upper Level Curriculum Development for a BAS in Marine Sciences. Maui Rural Development Project (U.S. Dept of Labor subcontract). Lead PI: EA-14982-04-60 (8/1/09 – 12/30/09) - \$14,900

Institutional Grant: Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve–Hawaii Institute of Marine Biology research partnership. NOAA, NOS, Marine Sanctuary Program Institutional MOA Award (R. Toonen, J. Leong, B. Bowen, S. Karl, R. Gates, K. Holland, C. Meyer, G. Aeby, P. Jokiel, K. Rodgers, M. Rappé, M. Rivera, J. Lemus). (2008-2009) – \$1,340,000 (\$100,000 to Lemus)

COSEE-West: Centers for Ocean Sciences Education Excellence. NSF Ocean Sciences education initiative. Co-PI: OCE-0753224 (2007-2012) - \$2.6 million

Edison Challenge: Edison International corporate sponsorship of science education. Co-PI (2006-2010) - \$1 million

COSIA – Communicating Ocean Sciences to Informal Audiences. Lead PI: SA5173-11062 (2006-2009) - \$60,900

QuikScience program: Quiksilver corporate sponsorship of science education. Co-PI (2004-2009) - \$1.25 million

COSEE-West program: NSF Ocean Sciences education initiative (2002-2007) - \$1.25 million

National Sea Grant Aquatic Nuisance Species Initiative. Co-PI (2001-2003)
Physiological and molecular studies for assessing the invasion potential of *Caulerpa* and early warning outreach - \$138,200

California Whale Tail Grant: Parent-Child Science Education (2001-2002)

Santa Monica Bay Restoration Project PIE Grants:
Incorporating storm water mitigation into architectural designs (2000-2001)
Parent-Child science education program (2000-2001)

USC Sea Grant Traineeship (1996-1997)

ARCS (Achievement Rewards for College Scientists) (1994-1996)

Office of Naval Research Graduate Research Fellowship (1993-1994)

PUBLICATIONS:

REFEREED PAPERS

- Lemus, J. D.**, A. Read, A. Knight, H. Havens, J. Mooney, S. Teck, E. Franklin, M. Chow, J. Lindholm, A. Rosenberg, L. Abramson, B. Barr, C. Benson, E. Brody, K. Carvalho, C. Combest-Friedman, J. Dupont, K. Emery, D. Fluharty, B. Halpern, J. Johnson, S. Katz, B. Keller, J. Kerr, E. Klein, E.S. Rutherford, R. Warner, R. Pavia (in prep). Marine Ecosystem-based Management Course Guide. *Journal of Geoscience Education*.
- Franklin, E.C, T. Wood, M. Dunlap, M. Iacchei, B. Laws, A. Kerr, B. Kokubun, M. Chow, J. Shackeroff and **J.D. Lemus** (in review). Ecosystem-Based Management and the Hawaiian Islands Humpback Whale National Marine Sanctuary: A Case Study of a Single-Species Marine Protected Area. *Journal Marine Biology, Ecosystem Management of Pacific Islands, Special Issue*.
- Lemus, J.**, C. Bishop, and H. Walters (2010). QuikScience: Effective Linkage of Competitive, Cooperative, and Service Learning in Science Education. *American Secondary Education* 38(3): 40-61.
- Kittinger, J.N., D.J. Skillings, K.K. Carvalho, L.L.N. Reeve, M. Hutchinson, J. O'Malley, K. Cullison, J. Shackeroff, M. Chow, and **J. Lemus** (2009). Reconciling Ecosystem-Based Management and Focal Resource Conservation in the Papahānaumokuākea Marine National

Monument. *Marine Sanctuaries Conservation Series* ONMS-09-04. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD.

Lemus, J. and L. Murray (2007). Leveraging COSEE: Going Above and Beyond. *Current: J. Marine Education* 23(1): 32-33. Invited author.

Lemus, J. (2007). Ocean Literacy. *Tidelines* (Cabrillo Marine Aquarium). Invited author.

Doino Lemus, J. and M. McFall-Ngai (2000). Alterations in the proteome of the *Euprymna scolopes* light organ in response to symbiotic *Vibrio fischeri*. *Applied and Environmental Microbiology* 66: 4091-4097.

Visick, K.L., J. Foster, **J. Doino**, M. McFall-Ngai and E.G. Ruby (2000). *Vibrio fischeri lux* genes play an important role in colonization and development of the host light organ. *J. Bacteriol.* 182: 4578-4586.

Doino, J. and M. McFall-Ngai (1995). A transient exposure to symbiosis-competent bacteria induces light organ morphogenesis in the host squid. *Biological Bulletin* 189: 347-355.

Muscatine, L., D. Grossman and **J. Doino** (1991). Release of symbiotic algae by tropical sea anemones and corals after cold shock. *Marine Ecology Progress Series* 77: 233-243.

EDITORIAL:

Toonen, R., **Lemus, J.**, Selkoe, K., Halpern, B. (2010 in press). Special Issue: Toward Ecosystem Management of Pacific Islands. *Journal of Marine Biology*. Available online at <http://www.hindawi.com/journals/jmb/aip.html>

Lemus, J. (Sp 2007). Editor. *Smilodon*. Newsletter of the Southern California Academy of Sciences.

Lemus, J. (W 2006). Editor. *Smilodon*. Newsletter of the Southern California Academy of Sciences.

Lemus, J. (Sp 2005). Editor. *Smilodon*. Newsletter of the Southern California Academy of Sciences.

Lemus, J.D. and C. Cudaback, Eds. (2003). Executive Summary, Review Panel Report: Huntington Beach Phase III Final Draft Report. *University of Southern California Sea Grant Program #USCSG-TR-02-2003*.

Lemus, J.D. and S. Weisberg, Eds. (2000). Huntington Beach Closure Investigation: Technical Review. *University of Southern California Sea Grant Program #USCSG-TR-01-2000*.

REPORTS

Lemus, J., F. Thomas, M. Heckman, M. Rivera. (2010). HIMB Strategic Plan and Brochure.

Lemus, J. (2010). HIMB-NOAA Fellowship Program *National Marine Sanctuary Program Memorandum of Agreement Semi-Annual Progress Report*.

Lemus, J. (S 2009). HIMB-NOAA Fellowship Program *National Marine Sanctuary Program Memorandum of Agreement Semi-Annual Progress Report*.

Grifman, P. and **J.D. Lemus** (2005). Public Report on the Biological Baseline Studies at the Ports of Los Angeles and Long Beach. *University of Southern California Sea Grant Program #USCSG-TR-01-05*.

Lemus, J.D. and J. Pederson (2001). The Relationship Between Sea Grant Extension and Research. In: The Fundamentals of Sea Grant Extension (invited author). National Sea Grant College Program.

PUBLISHED ABSTRACTS

Doino, J. and M. McFall-Ngai (1997) American Zoologist 37(5): 125A

Doino, J. and M. McFall-Ngai (1996) American Zoologist 36(5): 41A

Doino, J. and M. McFall-Ngai (1995) American Zoologist 35(5): 30A

Doino, J. and M. McFall-Ngai (1993) American Zoologist 33(5): 69A

CURRICULA

UH Maui College Bachelor's of Applied Science Degree Program in Applied Ocean Studies. 2010. Complete upper division curriculum, including course descriptions, pre-requisites, learning outcomes, competencies, course content, references, and assessments, **J. Lemus (80%)** and A. Coopersmith.

Marine Ecosystem Based Management Graduate Course Curriculum Guide. 2010.

Collaboration between NOAA ONMS and seven universities as a Distribute Graduate Seminar sponsored by the National Center for Ecological Analysis and Synthesis. **J. Lemus**, A. Read, A. Knight, H. Havens, J. Mooney, S. Teck, E. Franklin, M. Chow, J. Lindholm, A. Rosenberg, L. Abramson, B. Barr, C. Benson, E. Brody, K. Carvalho, C. Combest-Friedman, J. Dupont, K. Emery, D. Fluharty, B. Halpern, J. Johnson, S. Katz, B. Keller, J. Kerr, E. Klein, E.S. Rutherford, R. Warner, R. Pavia.

Ocean Literacy Scope and Sequence for Grades K-12. 2009. Companion guide to OLEPFC (below) for curriculum developers, standards committees, informal science educators, and schoolteachers regarding how ocean science concepts can be taught throughout the K-12 curriculum. See http://oceanliteracy.wp.coexploration.org/?page_id=279 for list of collaborative authors. http://oceanliteracy.wp.coexploration.org/?page_id=111

Ocean Literacy Essential Principles and Fundamental Concepts. 2007. National collaborative effort by ocean scientists and educators to address the lack of ocean science concepts in National Science Education Standards. Recognized by many federal science education agencies and institutions as the foundation for national ocean literacy. See http://oceanliteracy.wp.coexploration.org/?page_id=279 for list of collaborative authors. http://oceanliteracy.wp.coexploration.org/?page_id=90

COSEE-West Lesson Plans. 2005. USC/UCLA COSEE-West Program. Marine science lessons for K-12 teachers. Collaborative authors. <http://www.usc.edu/org/cosee-west/resources.html>

Parent-Child Education Program. 1999. USC Sea Grant Program. Special program for students and their parents to study marine science one evening a week over the course of 7 weeks. Specific activities include: Communities, Food Webs, Zonation, Tides, Quadrat Sampling, Plankton, and Limited Resources. L. Whitley and **J. Lemus**. <http://www.usc.edu/org/seagrant/Education/ParentChildEdu/ParentChildEd.html>

Island Explorers Marine Science Curricula. 1998. USC Sea Grant Program. L. Whitley, S. Lafferty, and **J. Lemus**. Student-centered science curriculum for elementary and middle school that is characterized by hands-on, real-life marine science activities that directly correlate with the California Science Framework. It uniquely focuses on Southern California and Catalina Island coastal environs. <http://www.usc.edu/org/seagrant/Education/IELessons/IELessons.html>

IE Online Marine Science Activities. 1999. USC Sea Grant Program. **J. Lemus** and L. Whitley. Interactive enhancement activities that correlate with the Island Explorers

Curriculum. “Garibaldi Territory”
<http://www.usc.edu/org/seagrant/Education/Garibaldi/index.html> and “Help with Kelp”
<http://www.usc.edu/org/seagrant/Education/Kelp/index.html>

MULTIMEDIA

Ocean Tube Animated Movies. 2006. USC COSEE Program, Wrigley Institute for Environmental Studies, and Division of Animation and Digital Arts. Animated shorts focused on ocean concepts and current research by USC ocean scientists. **J. Lemus** (creator and developer). Features topics on: “Algal Blooms”, “Deep Ocean”, “DNA-PCR”, “Eels, Mangroves”, “Phytoplankton”, and “Sheep Head” http://www.usc.edu/org/cosee-west/ocean_tube.html

WEBSITES (CREATIVE DESIGNER)

Laulima A ‘Ike Pono – <http://www.hawaii.edu/HIMB/Education/LAIP.html>; <http://.laip-heeia.blogspot.com>

COSEE-West – <http://www.usc.edu/org/cosee-west>

QuikScience – <http://www.usc.edu/quikscience>

Edison Challenge – <http://www.usc.edu/org/edisonchallenge/>

MEDIA COVERAGE

Laulima A ‘Ike Pono: Internships at He‘eia Fishpond. Honolulu Advertiser. May 4, 2006.
<http://www.honoluluadvertiser.com/article/20100503/GETPUBLISHED/5030366/Laulima+A+Ike+Pono++Research+Internship+at+Heeia+Fishpond>

Adobe Solutions Case Study: Science and Art Converge at USC with Creative Suite 3 (featured faculty). 2006.
<http://www.adobe.com/education/products/creativesuite/customers/hed/>

Scientists Hope to Size Up the Health of the Ocean in a Heartbeat. Los Angeles Times. October 19, 2003. <http://articles.latimes.com/2003/oct/19/local/me-crab19>

Global Heartbeat Science. KLCS Homework Hotline (featured scientist). February 2002.

PRESENTATIONS AT CONFERENCES AND MEETINGS:

INTERNATIONAL

Lemus, J. “Community Collaborations in Geoscience Research at a Local Fishpond in Hawaii”. International Pacific Marine Educators Network Conference. Sigatoka, Fiji (2010)

Duncan, K., Heckman, M., **Lemus, J.** “Beyond The Hype: opportunities & guidelines for effective outreach and education” (poster). International White Shark Symposium. Honolulu, HI (2010)

Lemus, J. “Motivational approaches in ocean sciences education”. International Pacific Marine Educators Network Conference. Townsville, Australia (2008)

Lemus, J., Fong, P., Hamner, W., Tuddenham, P., Noda, G., Lee, J. “Leveraging Undergraduates as Online Teaching Assistants in the Ocean Sciences”. Pacific Congress on Marine Science and Technology. Honolulu, HI (2008)

Armstrong, K. and **Lemus, J.** “The QuikScience Challenge Partnership”. Waves of Change: Women, Youth and the Sea: Partnering for the Protection of the Marine Environment and the Sustainable Use of its Resources – Pacem in Maribus Conference. Malta (2007)

Lemus, J., “Urban Ocean Science Education at the University of Southern California”. American Society of Limnology and Oceanography, Ocean Science Summer Conference. Spain (2005)

NATIONAL

Lemus, J. and Duncan, K. “COSEE: Culturally-relevant ocean sciences education in Hawaii “. National Science Teachers Association Annual Conference (2010)

Lemus, J., Duncan-Seraphin, K., Cooper, P., and Coopersmith, A. “Pacific Ocean Literacy for Youth, Publics, Professionals & Scientists”. National Marine Educators Association (2009)

Bidle, T., **Lemus, J.**, Dykes, K. “COSEE: The QuikScience Challenge”. National Science Teachers Association Annual Conference (2008)

Hamner, W., Fong, P., **Lemus, J.**, Tuddenham, P., Lee, J., Noda, G. “Leveraging Undergraduates as Online Teaching Assistants in the Ocean Sciences” (poster). American Society of Limnology and Oceanography (2008)

Lemus, J. and Close, A. “Science Outreach at the USC Wrigley Institute”. American Society of Limnology and Oceanography (2006)

Lemus, J. “QuikScience: An Innovative Approach to Engage Diverse Students in Ocean Science Education” (poster). National Oceanic and Atmospheric Administration Education and Science Forum (2006)

Lemus, J., “Building a Community-based Ocean Science Education Infrastructure”. American Zoo and Aquarium Association Annual Conference (2004)

Whitley, L. and **Lemus, J.** “Creating and Sustaining a Marine Science Parent-Child Education Program”. National Marine Educators Association (2003)

Lemus, J., “The Global Heartbeat education program”. American Society of Limnology and Oceanography (2002)

Lemus, J. “Island Explorers Summer Science Program for Middle School Girls”. National Marine Educators Association (2000)

REGIONAL

Lemus, J., Duncan-Seraphin, K. Coopersmith, A. “The OCEANIA Marine Educators Association”. OCEANIA Annual Conference at Hawaii Science Teachers Association (2010)

Duncan-Seraphin, K., **Lemus, J.**, Veary, K., Wong, K., Smith, D., Putnam, H. “Communicating Ocean Sciences: Linking Educators and Research Scientists in a Cultural Context”. Hawaii Education Research Association Annual Conference (2010)

Strang, C., Duncan-Seraphin, K., and **Lemus, J.** Incorporation of Traditional Knowledge in Communicating Ocean Sciences. Alaska Marine Science Symposium (2010)

Lemus, J., Coopersmith, A., Spalding, S. “The OCEANIA Marine Educators Association”. Inaugural OCEANIA conference at Hawaii Science Teachers Association (2009)

Lemus, J. “QuikScience: An Innovative Approach to Engage Diverse Students in Ocean Science Education” (poster). California and the World Oceans (2006)

Duguay, L., Franks, S., Hamner, P., Hamner, B., Kwon, P., **Lemus, J.**, Michaels, T., Moll, R., Peach, C., Sullivan, D., Whitley, L. “Centers for Ocean Science Excellence in Education (COSEE): A national and regional model for engaging ocean scientists and educators in collaborative activities”. California and the World Oceans (2006)

Lemus, J. and Whitley, L. “The USC Parent-Child Education Program”. Los Angeles Unified School District Gifted and Talented Education Conference (2004)

Whitley, L., Grifman, P., **Lemus, J.** “Developing K-12 Marine Science Education Programs: Island Explorers Case Study”. California and the World Oceans (2002)

Lemus, J. “Lessons Learned: Recommendations for water quality investigations from a technical review of the Huntington Beach closure of 1999”. California Coastal Coalition/California Shore and Beach Preservation Association, Preserving Coastal Environments conference (2000)

SERVICE WORK:

LEADERSHIP:

Secretary, Board of Directors, Paepae o He‘eia (2010 – 2012)

Chair, OCEANIA Regional Chapter of National Marine Educators Association (2009 – 2011)

Co-chair, HIMB Laboratory Safety Committee (2009 – present)

Co-chair, HIMB Visitor Information Committee (2009 – present)

Co-PI, “Twenty-five Year Retrospective of the HIMB Pauley Summer Program”. Edwin Pauley Summer Program (2009)

Vice President, Southern California Academy of Sciences Board of Directors (2002-04; 2006-07)

Board Member, Southern California Academy of Sciences Board of Directors (1999 – 2007)

Chair, Sea Grant Pacific Region Extension Leaders Committee (2000)

President, Marine Science Graduate Students Association, University of Southern California (1996 – 97)

REVIEWS:

NASA Astrobiology: Exobiology and Evolutionary Biology program (2010)

Panel member for NSF Graduate Research Fellowship Program (2009)

Astrobiology Journal (2008)

Environmental Science and Technology Journal (2008)

NSF CAREER Awards (2006)

CONFERENCES:

Organizer, OCEANIA Conference, Honolulu, HI (2010)

Organizer, OCEANIA Conference, Honolulu, HI (2009)

Moderator, Public Education Session, State of the Bay Conference, Santa Monica, CA (2004)

Symposium Chair, Southern California Academy of Sciences, “Virtual Oceans” (2001)

Symposium Chair, Southern California Academy of Sciences, “Scientific Research at Public Aquariums” (2000)

OTHER:

Delegate, National Science Teachers Association U.S.-Sino Education Forum, Shanghai, China (November 2010)

Co-editor, Journal of Marine Biology “Ecosystem Management of Pacific Islands” Special Issue (December 2010)

Education alternate, Hawaiian Islands Humpback Whale NMS Sanctuary Advisory Committee (2010 – 2012)

Invited Board Member, UH Hilo CREST Advisory Board (2009 – present)
Invited Panelist, UH Hilo TCBES Faculty Mentoring Workshop (Aug 2010)
Advisory Committee Member, UH Manoa McNair Scholars Program (2009)
HIMB Strategic Plan and Brochure Education and Outreach section lead (2009 – 2010)
Judge, Hawai‘i State Science Fair (2010, 2008)
Member, SOEST Education and Outreach Committee (2009 – present)
Member, Santa Monica Pier Aquarium Advisory Committee (2006 – 2008)
Technical Advisory Committee, Santa Monica Bay Restoration Commission (1998 – 2007)
Judge and Moderator, Southern California Regional Ocean Science Bowl (1998 – 2007)
Science Judge, Los Angeles County Science Fair (1998 – 2007)
Invited Science Consultant, Los Angeles Academic Decathlon (2003)
Invited participant, EARTH Workshop: “Education and Real-Time Data Workshop: Where should the two meet?” (2002)
Community Emergency Response Team (CERT), Culver City (2002 – 2007)
Docent, UCLA Ocean Discovery Center (1996 – 97)
Volunteer, UCLA Medical Center, Pediatric Ward (1990)

PROFESSIONAL SOCIETIES:

American Society of Limnology and Oceanography
National Marine Educators Association
International Pacific Marine Educators Network
National Science Teachers Association
Hawaii Academy of Sciences
American Association of University Women
Southern California Academy of Sciences

OTHER SKILLS:

Physiological and biochemical laboratory techniques
Light microscopy and scanning electron microscopy
Advanced Diver Certification (NAUI)
Diving Rescue Certification (NAUI)
Underwater Photography Certification (PADI)
Small boat operations
Underwater and intertidal field survey methods

Carlie Sandra Wiener, B.A., M.E.S., A.B.D.

CONTACT INFORMATION



EDUCATION

- Doctorate in Environmental Studies
Faculty of Environmental Studies, York University, Toronto Canada
Expected Graduation Fall 2013
- 2007 Master in Environmental Studies
Graduate Diploma in Environmental/Sustainability Education
Major Paper Title: *Imi I Na Ano O Ka Moana: An evaluation of ocean education and marine tourism practices in Hawai'i.*
Faculty of Environmental Studies, York University, Toronto Canada
Advisor: Dr. Paul Wilkinson
- 2005 Specialized Honors Bachelor of Arts
Communications Studies, Faculty of Arts, York University, Toronto Canada
Graduated Magna Cum Laude, Dean's List 2002 – 2005

CERTIFICATIONS

- 2010 Certified Interpretive Guide, National Association of Interpretation
- 2010 Communication Ocean Sciences Center for Ocean Sciences Education Excellence (COSEE) Training
- 2008 University of Hawai'i Scientific Diver Certification

SCHOLARSHIPS & AWARDS

- 2011 Dolphin Quest Research Grant \$6,000
- 2010-2013 York University Graduate Fellowship for Academic Distinction \$27,500
- 2010-2011 Ontario Graduate Scholarship Doctorate Funding \$10,000 (Declined)
- 2006-2007 Social Science & Humanities Research Council Scholarship \$17,500
- 2006 York University Awards Graduate Research Scholarship \$1,810
- 2005-2006 York University Entrance Scholarship Graduate Assistantship \$2,320
- 2004-2005 Eric Koch Award
- 2004-2005 Outstanding Academic Achievement \$1,281
- 2003- 2004 Outstanding Achievement in Grade Point Average Scholarship \$1,113

Carlie Sandra Wiener, B.A., M.E.S., A.B.D.

PROFESSIONAL EXPERIENCE

- 2011 ENVS 3150 Human Animal Relationships. Teaching Assistant. York University, Toronto.
- 2009-2011 Ecosystem-based management and science communications alignment study, Hawai'i Institute of Marine Biology, University of Hawai'i
- 2009 – Present Ocean Fest: Intergenerational hands-on marine science learning program, School of Ocean and Earth Science and Technology (SOEST), University of Hawai'i
- 2008-2009 Ocean Awareness Training (OAT) course leader, Hawai'i Institute of Marine Biology/ NOAA Office of National Marine Sanctuaries, University of Hawai'i
- 2008 Navigating Change Gr.4-6 marine stewardship curriculum development, Polynesian Voyaging Society, Honolulu, HI
- 2007 – Present Northwestern Hawaiian Islands research & outreach specialist Hawai'i Institute of Marine Biology, University of Hawai'i
- 2007 – Present The Best Kept Secret in Kāne'ōhe Bay: Northwestern Hawaiian Islands Science course instructor, Windward Community College, University of Hawai'i
- 2007 – 2009 Changing Tides education & outreach campaign coordinator, The Coral Reef Alliance (CORAL), Honolulu, HI
- 2007 Northwestern Hawaiian Islands program specialist, Division of Aquatic Resources, University of Hawai'i
- 2007 Mooring buoy community manager, Malama Kai Foundation, Hawai'i Island
- 2006-2007 Recreation impacts to reefs local action strategy specialist, Division of Aquatic Resources, University of Hawai'i
- 2006 U.S. Coral Reef Task Force volunteer assistant, State of Hawai'i, Division of Aquatic Resources
- 2006 Coral reef ecology curriculum development, environmental education certificate program, York University
- 2005-2006 Graduate assistantships, Faculty of Environmental Studies, York University

Carlie Sandra Wiener, B.A., M.E.S., A.B.D.

PROFESSIONAL EXPERIENCE (Continued)

- 2005 Coral reef management program internship, State of Hawai'i, Division of Aquatic Resources
- 2005 Assistant stranding coordinator, Marine Mammal Conservancy, Key Largo FL
- 2004 Marine Mammal Conservancy internship, Key Largo FL
- 2002-2006 Event coordinator, Carlie Wiener Events, Toronto ON

SEA TIME/ PROFESSIONAL EXPEDITIONS

- 2011 Cascadia Research Collective Cetacean Research Tagging Cruise
- 2009 Papahānaumokuākea 'Ahahui Alaka'i Experiential Leadership Program
Presenter and Participant – Midway Atoll, Northwestern Hawaiian Islands
- 2008 Pacific Islands Fisheries Science Center Cetacean Research Tagging Cruise
Cooperating Scientist - NOAA Ship R/V Oscar Elton Sette.
- 2007 Northwestern Hawaiian Islands Research Expedition Outreach Personnel
Outreach Personnel - NOAA Ship Hi'ialakai

PUBLICATIONS & REPORTS

Refereed Contributions

Wiener, C.S., B. C. Bruno. J. Fooley. (2011). Ocean investigators: Learning to monitor coral reefs using quadrats. *Green Teacher Special Issue: Marine Education* 92, 31-33.

Wiener, C.S., M.A. Rivera., R.J. Toonen., *et al.* (2011). Creating effective partnerships in ecosystem based management: A culture of science and management. *Journal of Marine Biology Special Issue: Ecosystem-Based Management of Pacific Islands.* Article ID 241610, 8 pages doi:10.1155/2011/241610.

Wiener, C.S., & M.A. Rivera. (2010). Journeying through the Hawaiian Archipelago: Using marine science and place-based learning at the Hawai'i Institute of Marine Biology. *Current: The Journal of Marine Education* 26 (4).

Bruno, B. C. & **C.S. Wiener.** (2010). Ocean FEST: Families Exploring Science Together. *Journal of Geoscience Education* 59, 13-21.

Wiener, C.S. & M.O. Lammers. (2010). Sound and observation: Listening for clues using real life acoustic recorders. *American Biology Teacher* 72 (6), 365-368.

Carlie Sandra Wiener, B.A., M.E.S., A.B.D.

PUBLICATIONS & REPORTS (Continued)

Wiener, C.S., M.D. Needham., P.F. Wilkinson. (2009). Hawaii's real life marine park: interpretation and impacts of commercial marine tourism in the Hawaiian Islands. *Current Issues in Tourism* 12 (5), 489-504.

Wiener, C. (2008). Imi i na ano o ka moana: (Learning the ways of the ocean): An evaluation of ocean education and marine tourism practices in Hawaii. International Pacific Marine Educators Conference - Abstract. *Current- The Journal of Marine Education* 24 (2):54.

Books and Book Chapters

Wiener, C. (2008). Making a Difference: An Action Guide to Marine Conservation in Hawai'i. Honolulu, HI: Coral Reef Alliance.

State of Hawaii Division of Aquatic Resources. (2005). Getting Involved in Caring for Hawaii's Coastal Resources: A Community Guidebook. Honolulu, HI: Division of Aquatic Resources. * Contributed text and layout.

Reports

Toonen, R., J. Leong., & **C. Wiener.** (2007-2011). Hawai'i Institute of Marine Biology Semi Annual Report VII - XIII. Honolulu, HI: University of Hawai'i

Wiener, C. (2005). Report on Recreational Impacts to Hawai'i's Coral Reefs. Honolulu, HI: Division of Aquatic Resources.

Magazine Articles

Wiener, C. (July 2011). Jewel in the Pacific: Papahānaumokuākea. *Ocean Magazine*: 24-25.

REVIWER

2011	Current Issues in Tourism
2011	Environmental Education Research
2010	Journal of Marine Biology
2009/2010	Journal of Environmental Education

SELECTED CONFERENCE PRESENTATIONS

Dec 2011 "Understanding spinner dolphin marine tourism and human perceptions in Hawaii" 19th Biennial Marine Mammal Conference, Tampa, FL

July 2011 "A new ocean-themed community education program on climate change and sustainability for the Pacific Region" 6th World Environmental Education Congress, Brisbane, Australia

Carlie Sandra Wiener, B.A., M.E.S., A.B.D.

SELECTED CONFERENCE PRESENTATIONS (Continued)

- July 2011 “Making student connections with marine sanctuaries: Sharing cultural and environmental experiences throughout the Pacific” 6th World Environmental Education Congress, Brisbane, Australia
- May 2011 “The Dividing Culture of Science and Management: Human Dimensions of the Northwestern Hawaiian Islands Coral Reef Research Partnership” International Marine Conservation Congress, Victoria, Canada.
- Mar 2011 “Understanding the Problem with Dolphin-Swim Tourism” Thinking About Animals Conference, Brock University, Ontario, Canada.
- Feb 2011 “Communicating science for ecosystem based management: A case study of the Hawai‘i Institute of Marine Biology” American Society of Limnology and Oceanography Aquatic Sciences Meeting, San Juan, PR
- Feb 2011 “Science Management Integration Case Study and Recommendations for the Research Partnership” Northwestern Hawaiian Islands Symposium, East West Center, Honolulu, HI
- Nov 2010 “Friendly or Dangerous Waters? Understanding the Problem with Dolphin Tourism and Human Interactions”. Paper Presentation, 2nd Annual PhD Research Matters Symposium, York University, Toronto, Canada
- Aug 2010 “Ocean FEST: Families Exploring Science Together:” Poster Presentation, Hawai‘i Conservation Conference, Honolulu HI
- Jul 2010 “Families Exploring Science Together: An Intergenerational Approach to Marine Science” Workshop, International Pacific Marine Educators Conference, Sigatoka, Fiji
- Jul 2010 “Window to the Northwestern Hawaiian Islands through Place-Based Learning and Marine Sciences” Paper Presentation, International Pacific Marine Educators Conference, Sigatoka, Fiji
- Dec 2009 “Hawai‘i Institute of Marine Biology: Communicating Marine Sciences to Management & Community” Paper Presentation, International Environmental Communications Conference, Penang, Malaysia
- July 2009 “Northwestern Hawaiian Islands: Place-based Learning & Science” Paper Presentation, Hawaii Conservation Conference, Honolulu, HI
- May 2009 “Window to the Northwestern Hawaiian Islands through Place-Based Learning and Marine Sciences”, Paper Presentation, 5th World Environmental Education Congress, Montreal, Canada

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SELECTED CONFERENCE PRESENTATIONS (Continued)

- Jul 2008 “Changing Tides Education & Outreach Campaign: Developing Tools & Strategies to Reduce Threats to Hawaii’s Reefs”, Poster Presentation
Hawai‘i Conservation Conference, Honolulu HI
- Jan 2007 “Imi I Na Ano O Ka Moana: Learning the Ways of the Ocean” Paper
Presentation, International Pacific Marine Educators Conference,
Honolulu, HI
- Oct 2006 “Imi I Na Ano O Ka Moana: Learning the Ways of the Ocean” Paper
Presentation Canadian Network for Environmental Communication and
Education Conference, Nova Scotia, Canada
- Oct 2006 “Imi I Na Ano O Ka Moana: Learning the Ways of the Ocean” Paper
Presentation North American Association for Environmental Education
35th Conference, St Paul, MN
- Jul 2006 “Imi I Na Ano O Ka Moana: Learning the Ways of the Ocean” Paper
Presentation Hawai‘i Conservation Conference, Honolulu HI (poster)
- Jul 2006 “Whales Breaching for a Cause: The Deconstruction of Marine Tourism
Advertising” Paper Presentation, Hawai‘i Conservation Conference,
Honolulu HI
- May 2006 “Education and Outreach through the Merging of Marine Protected Areas
and Whale Watching” Paper Presentation, Environmental Studies
Association of Canada Congress Conference, Toronto Canada

SELECTED OTHER PRESENTATIONS

- Mar 2011 “Hawai‘i Institute of Marine Biology Northwestern Hawaiian Islands
Research Partnership” Guest Lecturer, Protected Area Management, York
University, Toronto, ON
- Jan 2011 “Predator Prey Relationships: The Case of the Tiger Shark and Hawaiian
Monk Seal” Guest Lecturer, Human Animal Relationships, York
University, Toronto, ON
- Nov 2010 “Marine Protected Areas and Marine Science Education: Examples and
Investigations” Faculty of Environmental Studies Research Fair, Toronto,
Canada
- Aug 2010 “Science Management Integration: An Overview of the Study”
Northwestern Hawaiian Islands Semi Annual Meeting, Honolulu, HI

Carlie Sandra Wiener, B.A., M.E.S., A.B.D.

SELECTED OTHER PRESENTATIONS (Continued)

- Jan 2010 “Science Management Integration” Northwestern Hawaiian Islands Symposium, Honolulu, HI
- Jan 2010 “Outreach and Education in the Northwestern Hawaiian Islands” Northwestern Hawaiian Islands Symposium, Honolulu, HI
- Nov 2009 “Hawai’i Institute of Marine Biology Northwestern Hawaiian Islands Research Partnership” Guest Lecturer, Recreation and Tourism, York University, Toronto, ON
- May 2009 “Hawaii Institute of Marine Biology Northwestern Hawaiian Islands Research Partnership” Presentation to Parks Canada, Vancouver, BC
- May 2009 “Outreach and Education in the Northwestern Hawaiian Islands” Northwestern Hawaiian Islands Semi Annual Meeting, Honolulu, HI
- Mar 2009 “Getting to Know Your Kaneohe Neighbor: The Hawaii Institute of Marine Biology” Hanauma Bay Nature Preserve, Honolulu, HI
- Nov 2008 “Outreach and Education in the Northwestern Hawaiian Islands” Northwestern Hawaiian Islands Semi Annual Meeting, Honolulu, HI
- Sept 2008 ”Science and Policy - The Role of the Scientists in Conservation and Resource Management Decision-Making” Hawaii Institute of Marine Biology, Kaneohe, HI
- May 2008 “Outreach and Education in the Northwestern Hawaiian Islands” Northwestern Hawaiian Islands Semi Annual Meeting, Honolulu, HI
- Feb 2008 “Recreation Impacts to Reefs and Changing Tides Conservation Program” Guest Lecturer, Geography of Global Tourism, University of Hawai’i, Honolulu, HI
- Nov 2007 “Outreach and Education in the Northwestern Hawaiian Islands” Northwestern Hawaiian Islands Semi Annual Meeting, Honolulu, HI
- Mar 2007 “Recreation Impacts to Reefs Local Action Strategy” Hanauma Bay Nature Preserve, Honolulu, HI

WORKSHOP & SYMPOSIUM LEADERSHIP

- July 2011 Locales of Knowledge in a Globalizing Research Condition Workshop 11th Invitational Seminar on Research Development in Environmental Education, Monash University, Australia

Carlie Sandra Wiener, B.A., M.E.S., A.B.D.

WORKSHOP & SYMPOSIUM LEADERSHIP (Continued)

- Feb 2011 4th Annual Northwestern Hawaiian Islands Research Partnership Symposium (Oahu) East West Center, Hawaii
Developed, organized and facilitated symposium for over 200 scientists.
- Dec 2010 3rd Annual Northwestern Hawaiian Islands Research Partnership Symposium (Oahu) East West Center, Hawaii. Developed, organized and facilitated symposium for over 200 scientists.
- Nov 2009 Making A Difference: Marine Conservation in Hawaii Workshop (Oahu) Office of National Marine Sanctuaries, Hawaii
Developed, organized, and facilitated workshop for over 100 people.
- Aug 2009 Making A Difference: Marine Conservation in Hawaii Workshop (Maui) Hawaiian Islands Humpback Whale National Marine Sanctuary, Hawaii
Developed, organized, and facilitated workshop for over 50 teachers and marine tourism operators.
- Sept 2008 Climate Change: Merging Science & Traditional Knowledge Workshop
Developed components of five day workshop, and organized, facilitated and coordinated workshop logistics.
- Aug 2008 Recreation Impacts to Reefs: Green Marketing & Education Workshop
U.S. Coral Reef Task Force, State of Hawai‘i
Developed, organized, and facilitated workshop for over 100 participants.
- Jun 2008 Navigating Change Curriculum Development & Workshop
Hawai‘i Institute of Marine Biology, University of Hawai‘i
- Jan 2007 UNESCO “Our Sea of Islands” Regional Forum for Oceania on Marine Managed Areas & World Heritage Coordinator
Northwestern Hawaiian Islands Marine National Monument,
Honolulu Hawai‘i
- Oct 2006 Simulation Benefits Assessment Workshop Facilitator, Hamilton Harbor Remediation Project, DSS Management Consultants Inc

VOLUNTEER ACTIVITIES, COMMITTEES & ASSOCIATIONS

- 2011-2012 Hawaii High School Senior Mentorship Program
2010 – 2011 York University Alumni Career Mentorship Program
2010 – Present Hawaii Environmental Educators Association
2008 U.S. Coral Reef Task Force Planning Committee
2007 – Present OCEANIA Pacific Marine Educators Network
2007 - Present Fish Friendly Business Alliance Volunteer Coordinator
2007 – 2010 Hawai‘i Conservation Conference Planning Committee

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VOLUNTEER ACTIVITIES, COMMITTEES & ASSOCIATIONS (Continued)

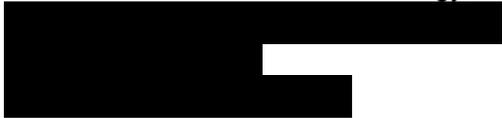
2007 – 2009	Malama Maunalua Makai Watch Program
2007-2008	Hawai‘i Ocean Safety Team (HOST)
2007-2008	International Year of the Reef Planning Committee Member
2006 – Present	Recreation Impacts to Reefs Local Strategy Steering Committee
2006 - 2008	Coral Reef Outreach Network (CRON)
2006 – 2008	Living Reef Awards Planning Committee Member
2006-2008	The Coral Reef Alliance Voluntary Standards Steering Committee
2004	Marine Mammal Stranding Program, Trained Rescuer

RESEARCH INTERESTS

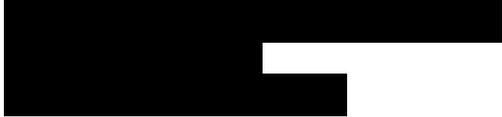
- Science management integration and science communication
- Marine tourism and recreation, recreational impacts to coastal ecosystems
- Environmental education and community based environmental strategies
- Marine policy and environmental management
- Marine science education and ocean literacy
- Cetacean ecology and behavior

REFERENCES

Dr. Robert Toonen
Associate Researcher
Hawai‘i Institute of Marine Biology, University of Hawaii



Dr. Malia Rivera
Education Specialist
Hawai‘i Institute of Marine Biology, University of Hawaii



Dr. Jo-Ann Leong
Director of Hawai‘i Institute of Marine Biology, University of Hawaii

