Concurrent Sessions ~ Thursday, 14 July, 2:00-2:20 & 2:00-2:45 pm

SESSION FORMAT(S): L/HO = Lab/Hands-on; F=Field; C=Computer Workshop; D/L=Demonstration/Lecture; P/R= Panel/Round-Table Discussion; S=20-Minute Snapshot
AUDIENCE(S): K=Preschool/Kindergarten; E=Elementary;M=Middle School; H=High School; C=College; R=Research Scientists; I=Informal Educators; A=Aquarium, Zoo, Museum Educators; P=Agency Personnel/Policy Makers; G=General

Increasing Environmental Literacy: How NOAA's Educational Programs Help Teachers
Ms. Marlene Kaplan & Joyce Gross, NOAA Office of Education & Sustainable Development, Washington, DC
S ~ E,M,H,C,I,A ***2:00-2:20 pm; KaLama 104A***

This presentations will help teachers learn about the many ways that NOAA's educational efforts can be used in the classroom. Americans rely on NOAA for an incredible variety of products: providing local weather forecasts, keeping coastal waters safe and vibrant, maintaining a sustainable supply of quality seafood, ensuring the safe transport of waterborne cargo, as well as keeping a close eye on the ever changing impact of our sun on space weather. We all wish to live safely and responsibly within the natural systems of the Earth. NOAA education programs fulfill this need by providing a wide range of programs that can meet teachers's needs.

Tracking Albatross across the Pacific
Mrs. Carol Keiper, Oikonos Ecosystem Knowledge and Cordell Bank National Marine Sanctuary, Benicia, CA
Glen Schuster, Signals of Spring
S ~ M,H,R,A,P ***2:00-2:20 pm; KaLama 108***

Albatrosses are far ranging predators that cross the Pacific Ocean regularly for breeding and foraging. Come learn how scientists are tracking these seabirds during the non-breeding season using satellites and find out how you can use the tracking data in the classroom. Participants will receive activities to do with students, albatross natural history information, and ways to get involved in marine conservation.

Teaching Marine Science in High School: A Wedding of Marine Biology and Physical Oceanography
Mr. Thomas Greene, NYSMEA, Brooklyn, NY
D/L ~ H,I,A,P,G ***2:00-2:45 pm; Hale 217***

It is time that "Marine Science" take its rightful place as a course offering in the high schools nationwide. Since 1996, the State of New York has approved the teaching of marine science, an interdisciplinary course containing subject matter in marine biology and oceanography. Participants in this workshop will receive The New York State Education Department's approved syllabus, which includes curriculum, lesson plans, labs and Regents exams.

"Evaluating Summer Science Programs, Improving Methods and Tracking Results"
Ms. Lynn Whitley, University of Southern California Sea Grant Program, Los Angeles, CA
Dr. Tara Rose Ph.D., Evaluator USC, Phyllis Grifman
D/L ~ M,H,I,A,G ***2:00-2:45 pm; Hale 218***

Summer science programs are conducted throughout the United States, helping students to develop and maintain interests in science through programs outside formal school settings. Knowing how well a program is meeting its goals is vital to sustaining and improving these prograMs. University of Southern California (USC) Sea Grant Program has conducted summer science education programs for 6 years. Programs have been aimed at all middle and high school female students, with particular outreach to underserved minorities. This presentation examines evolution of program evaluation over the course of the programs. Recently, working with a professional evaluator has allowed us to assess and expand our evaluation methodology and program goals. In this presentation we discuss evaluation findings in the context of lessons we have learned about program evaluation. Participants will leave with new ideas about their own evaluations and how they might revise or add to their own methods.

Taking Teachers to Sea: the Sea Scholars Program
Mrs. Mendel Graeber & Beth Biegler Hines, Dauphin Island Sea Lab, Dauphin Island, AL
D/L ~ K,E,M,H,C,R,I,A,P,G ***2:00-2:45 pm; Ka'a'ike 105A***

Come hear about my ten-day voyage aboard the USNS Sumner, T-AGS 60 Class, oceanographic ship, and learn how you can join the next Sea Scholars trip. The Sea Scholars Program is designed to allow classroom teachers to gain real world knowledge of oceanographic science. For the voyage in which I participated, I and 13 other teachers sailed from Pearl Harbor, Hawaii, to Portland, Oregon. While on board, we participated in the survey operations conducted by the Naval Oceanographic Office, and we attended classes (acoustics, meteorology, oceanography, geology, bathymetry) lead by the survey crew and by COSEE (Centers for Ocean Sciences Education Excellence) scientists. We were also given class resources, samples, and much more. Come learn how you can take advantage of this wonderful opportunity.

Concurrent Sessions ~ Thursday, 14 July, 2:00-2:45 pm

Where Have All the Fish Gone?
Ms. Mary Pickett, Waikiki Aquarium, Honolulu, HI
D/L ~ M,H,C,I,A,P,G ***2:00-2:45 pm; Ka'a'ike 105B***

The work of a growing number of researchers, biologists, fishermen and conservationists has clearly established that Hawaii's reef fish populations have declined by 75 to 80% in the last 100 years. By creating a presentation for its high school, college and community visitors, the Waikiki Aquarium joins with other voices to elevate public awareness of this crisis and to advocate for increasing marine protected areas, banning lay nets, regulating the aquarium trade and returning to traditional Hawaiian management practices. This power point presentation is a synthesis of work and publications by many organizations including the Hawaii Division of Aquatic Resources, The Hawaii Audubon Society, Pacific Fisheries Coalition, The Hawaii Coral Reef Initiative, and the Marine Aquarium Council.

Pharmacy From the Sea
Ms. Tara Treiber, Oklahoma Aquarium, Jenks, OK
D/L ~ M,H,I,A,G ***2:00-2:45 pm; Ka'a'ike 105CD***

Medicines are important in our modern lives, from our daily vitamins to chemotherapy drugs. Most people are unaware of how many of these compounds come from marine organisms or are copied from chemicals derived from algae and animals. This program will look at the history of using the sea's bounty to cure man's ills, as well as the promise of new medicines the ocean holds. Presentation will also include some possible activities for educators to use at their institutions.

From Lecturer to Liaison – Empowering Youth to Take Action for Conservation
Ms. Tara Taylor & Ms. Lisa Tautz, Vancouver Aquarium Marine Science Centre, Vancouver , BC, Canada
P/R ~ M,H,I,A ***2:00-2:45 pm; Ka'a'ike 107***

Youth programs at the Vancouver Aquarium have traditionally involved top-down programs with adult "experts" and youth "helpers". We are implementing a new program to empower youth by offering our skills and resources as facilitators. A new model for youth action, the ACT (Aquatic Conservation Team) program, will run at the Vancouver Aquarium throughout the spring of 2005. ACT challenges youth to take ownership of their own conservation contributions; participants will choose a conservation issue, plan a course of action and evaluate their impact. This workshop will outline the evolution of youth activation programs at the Vancouver Aquarium, present the results and lessons learned from the ACT pilot and encourage discussion about implementing similar programs with youth in other settings..

Stop the Invasion
Dr. Maia McGuire, Florida Sea Grant, St. Augustine, FL
D/L ~ E,M,H,I,A,G ***2:00-2:45 pm; Ka'a'ike 108***

Learn how to implement an interactive, standards-based program for any grade level. "Stop the Invasion" is a 2:00-hour program geared towards 5th graders. The program addresses science standards (primarily Science as Inquiry) in an interactive format. Students learn about invasive species as they address experimental design, human interactions with the environment and observational skills. The program is designed so 4 or 5 classes rotate through 4 or 5 stations during a morning or afternoon session. Activities used at each station will be profiled and are easily adaptable for other grade levels or subject matter.

Oceans for Life Update and National Geographic's New Ocean Community
Ms. Francesca Cava, National Geographic Society, Santa Barbara, CA
D/L ~ K,E,M,H,C,I,A,G ***2:00-2:45 pm; Ka'a'ike 109***

The National Geographic Society continues to focus on the importance of the ocean in our lives and in our schools. Come listen to a virtual interview with Dr. Rita Colwell, former director of the National Science Foundation, get an update on Crittercam, Classroom Exploration of the Oceans 2005 and the new Geographic online Online Community. Participants will also receive new Oceans for Life lesson plans and other educational materials.

Sharks and People: Update and Perspectives
Mr. Randy Honebrink, Hawai'i Division of Aquatic Resources, Honolulu, HI
D/L ~ G ***2:00-2:45 pm; KaLama 103***

Sharks play important roles in balancing marine ecosystems, but in humans they evoke a spectrum of emotions unmatched by any other group of animals. Fewer than 10% of all known shark species have ever been known to hurt people. But on those rare occasions when shark bites occur, they generate attention that is out of proportion to the level of risk itself, and media coverage is often sensationalistic. This presentation will put the shark attack issue in perspective by covering the recent history of shark bite incidents in Hawaiian waters, the value of statistical information obtained from these incidents in reducing risk of injury, and a brief summary of current tiger shark research and its application to public safety.

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Marine Sanctuary Scenario Project Based Learning : Underwater Robotics in Hawai'i.
Mr. William Speed, Hawai'i Underwater Robot Challenge/MATE Hawai'i Regional, Kailua, HI
D/L,L/HO,C ~ M,H,C,I,G,voc ed ***2:00-2:45 pm; KaLama 104B***

Describe Hawai'i Underwater Robot Challenge mission scenario (a Pacific Marine Sanctuary)and scoring elements(written Mission Site Research Report, ROV Technical Report, Presentation Poster/Visual Aid, Oral Presentation, ROV Operations) development and their subsequent application across a variety of content standards for students preparing their ROV project for culminating activity: Challenge Day on Oahu or Hawai'i.

Channel Islands Marine Reserves - Linking Research and Education
Ms. Julie Bursek & Laura Francis, NOAA Channel Islands National Marine Sanctuary, Oxnard, CA
D/L ~ M,H,C,R,I,A,P,G ***2:00-2:45 pm; KaLama 107***

This session will highlight efforts to link research and monitoring of Channel Islands marine reserves with education and outreach. The Channel Islands National Marine Sanctuary partners with university and government researchers to monitor resources within the marine reserves in order to establish baseline data that will be used to monitor changes over time. ROV surveys, sidescan sonar mapping, SCUBA surveys, and benthic surveys are some of the monitoring techniques used. Educational programs are being developed to communicate science from these monitoring efforts to educators through Teacher at Sea programs, Ocean Explorers GIS project, LiMPETS, From Shore To Sea Lecture Series, student ROV projects, and website activities. Learn how you can access these resources and take home posters and educational materials.

Shipwrecks "LIVE" in the Classroom
Ms. Cathy Green, Thunder Bay National Marine Sanctuary and Underwater Preserve, Alpena, MI
Kate Thompson, National Marine Sanctuary Program
D/L ~ E,M,H,C,I,A,G ***2:00-2:45 pm; KaLama 109***

Travel beneath the waves with divers and archaeologists from NOAA's National Marine Sanctuary Program to visit the pristine shipwrecks of the Great Lakes, and to unlock the hidden secrets of the USS Alligator. With the advent of recent technological advances, live webcasts and on-demand video technology from archaeological expeditions allow students and teachers to participate in scientific missions from their classrooms. These distance-learning programs establish a link with our maritime past and connect our nation's students with an array of remote and unique cultural resources, inspiring their interest in the marine sciences. This presentation discusses the impact of these programs on classroom education, as well as explaining the advantages of this type of technology in teaching history, science, geography, and archaeology in an educational setting.

Tide Pool Tales: Ho'ike o Haleakala curriculum
Dr. Kathleen Ireland, Seabury Hall , Makawao, HI
L/HO ~ H ***2:00-2:45 pm; Laulima 107***

Teaching the interrelationships inherent in marine biology and oceanography can be daunting. Often we get sidetracked, teaching one organism, one phylum or one adaptation at a time, leading our students to view life in the oceans as separate entities rather than as an intricate, inter-related whole. Using the Ho'ike o Haleakala curriculum, Marine Module Unit three, tide pools are used to teach the process of looking not only at the organisms, but also at the conditions, the adaptations and the expected interactions among theses factors in each portion of the intertidal zone. In this workshop we will participate in the classroom portion of the curriculum, sharing helpful advice along the way to get the most from this wonderfully prepared curriculum.

FOSSIL BONES AND PETOSKEY STONES
Mr. Bruce Lampright, Spring Island Trust/LowCountry Institute, Okatie, SC
Carmelina Livingston, South Carolina Aquarium
L/HO ~ G ***2:00-2:45 pm; Laulima 225***

Marine fossils have long captured the imagination of countless students of the natural sciences. Join the presenters as they demonstrate how to polish a "Petoskey Stone", a fossilized colonial coral that is the state stone of Michigan. These Devonian Period specimens can be easily obtained and are a perfect earth science activity for students of all ages. Participants will also use a dichotomous key to identify various prehistoric shark teeth, some dating back almost 75 million years! Handouts will be available and a drawing will be held for several Petoskey Polishing Kits.

Concurrent Sessions ~ Thursday, 14 July, 2:00-2:45 pm

Projects: OceanAGE and OceanLiteray
Mrs. Andrea McCurdy, enterACTed, LLC, Woodstock, VA
C ~ M,H *2:00-2:45 pm; Laulima 227*

Join this session and learn of these two interactive online projects. OceanAGE stands for Ocean Careers to Inspire: Another Generation of Explorers. This NOAA Office of Ocean Exploration and NASA Oceanography project introduces students to ocean explorers through a series of online video, image and text profiles and web chats. OceanLiteracy is an interactive web site that invites visitors to give their opinions on what they think an ocean literate person should know about the oceans. Students and Teachers are invited to conduct a series of math and statistical exercises that utilize data gathered from the online opinion poll. Both projects are designed to be easy to use by classrooms with a wide variety of technical expertise.

The Oceans and Human Health, Get Involved with the Hollings Marine Laboratory
Susan Lovelace, Hollings Marine Laboratory, Charleston , SC
L/HO ~ M,H,C,R,I,P *2:00-2:45 pm; Science 10A*

OK, we know that it all flows down stream, stays in the ocean, or comes back in on the tide. Our activities often have an impact on coastal and ocean waters. How does that impact people? The Hollings Marine Lab, as a NOAA Center of Excellence for Oceans and Human Health, initiates research and establishes programs that link environmental conditions in the coastal zone to human health and socio-economic well being. These actions will bring the assessment cycle full circle, considering the impacts of the coastal environment on man and society. In this session you will learn about current research and play with activities and materials to make them more applicable to the human health part of the ecosystem.

Fish Ages;Teaching Fish Biology Through Otoliths.
Mr. Jeremy Lake, Florida Fish and Wildlife Conservation Commission, St. Petersburg, FL
L/HO ~ M,H,R,I,A,P,G *2:00-2:45 pm; Science 12A*

Discover how fish otoliths can be used as a hands-on teaching tool to demonstrate how biologists determine fish characteristics such as growth rate, maximum age, and age at sexual maturity. Through the study of otoliths—hard, calcium carbonate "ear stones" located behind the brain of bony fishes—biologists are able to age a fish by counting annual rings (similar to aging a tree). This information can then be combined with other life history data, enabling scientists to better manage fish stocks. Session participants will receive otolith samples and a curriculum kit illustrating otolith preparation, aging techniques, and how otoliths are used for life history and population analyses. Participants are encouraged to bring their own otoliths to trade with other attendees.

True experiments for upper elementary and middle schoolusing marine and aquatic concepts
Dr. Gail Tooker, S.U.N.Y. College at Cortland, Cortland, NY
L/HO ~ E,M *2:00-2:45 pm; Science 20A*

Not every hands-on activity is an experiment! This presentation will discuss the difference between true experiments and "other kinds of hands-on activities" and will engage the workshop participants in several true experiments that would engage upper elementary and middle school children in scientific inquiry about marine and aquatic concepts.

What About Water Quality? An Extended Classroom Investigation
Ms. Marjorie Bollinger, Eve Stelzer & Jennifer Sillitti, National Aquarium In Baltimore, Baltimore, MD
L/HO ~ E,M,H,I,A *2:00-2:45 pm; Science 21A*

The National Aquarium in Baltimore's AquaPartners Program has successfully implemented an extended learning experience that allows students to gain (and retain) a better understanding of the causes and effects of changing water quality conditions. While our program applies specifically to the Chesapeake Bay, our approach can be applied to any waterway. Join NAIB educators as they present a multi-disciplinary approach to teaching a unit on water quality using simple testing tools, an appropriate indicator species, and pre- and post-program activities to reinforce major concepts. Participate in this hands-on session and receive hand-outs and ideas that will assist you in teaching your students about water quality problems in your area and how your students can become a part of the solution

Tsunami Inquiry-Based Activities
Mrs. Joyce Stark, NOAA Office of Education and Sustainable Development, Washington, DC
L/HO ~ E,M,H,I,A,P *2:00-2:45 pm; Science 22A*

During the Indonesian Tsunami, a ten year old girl was credited for saving the lives of 100 fellow tourists when she noticed the tide was quickly retreating. Her family alerted others to clear the beach. She remembered this tsunami feature from a geography lesson about giant waves. Discover how sea floor topography affects "run-up" and land inundation during simulated tsunami events. Create a tsunameter to show differences between normal ocean currents and tidal waves. This presentation includes inquiry-based activities for elementary and secondary students.

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Malama I Ka 'Aina, Sustainability: How a Culturally Relevant Science Standard Supports Place-based Learning for Hawaii's Teachers, Students, and Community
Dr. Pauline W. U. Chinn, University of Hawaii at Manoa, Honolulu, HI
Johanna Kamaunau, Kupuna Program, Maui;
Michelle Kapana-Baird, Kaiser High School, Oahu;
Maverick Kawamoto, Konawaena High School, Hawai'i;
Matthew Kanemoto, Kahuku High School, Oahu
D/L ~ E,M,H,C,I,A ***2:00-3:45 pm; Agriculture 104***

The Hawaiian Islands, the most distant islands from continents support a highly endemic flora and fauna. Hawaiian stories, chants, dance, and convey detailed knowledge of place and values oriented to conserving resources. This traditional perspective is the foundation for standards-based curriculum development connecting culture, place, and science in personal, meaningful ways. Participants in Malama I Ka 'Aina will describe their place-based programs spanning mountain to sea.

Paddle-to-the-Sea: Lessons from the Great Lakes to teach about the salty seas!
Dr. Rosanne Fortner, Ohio State University /Ohio Sea Grant, Columbus, OH
Steve Steward, Michigan Sea Grant;
Helen Domske, New York Sea Grant
L/HO ~ E,M,I ***2:00-3:45 pm; Hale 216***

This hands-on session will present several activities based on the chapters of Holling Clancy Holling's award winning children's book, Paddle-to-the-Sea. Join us to learn about population densities of coastlines, watershed characteristics, and downstream flow of materials in the Great Lakes, and match your learning to what you know about your coastline. Within the context of progressing from inland to the sea, we'll look at turtle migrations, make "passports" for passage across boundaries, examine how locks work, and explore other interdisciplinary topics for science and geography.

Marine Mish-Mash and More!
Dr. Sharon Walker, Shelia A. Brown & Chris Snyder, The University of Southern Mississippi's Scott Aquarium, Biloxi, MS
L/HO ~ E,M,A ***2:00-3:45 pm; KaLama 204***

The workshop will provide hands-on activities, curricular materials, and information on teacher and student opportunities sponsored by Scott Aquarium's Project Marine Discovery (PMD) Programs, the COSEE:CGOM NSF grant, NOAA, and the Naval Oceanographic Office. We want to inspire educators at all levels to become excited about ocean sciences through trips to coastal Mississippi and travel aboard U.S. Navy Survey ships. Scott Aquarium provides a variety of programs for students (K-18), teachers, and Elderhostel groups from all over the country. PMD activities are inquiry-based and include classroom, laboratory, and field trip activities. The COSEE:CGOM activities include teacher/scientist and nonformal workshops. Navy activities include Sea Scholars for teachers and Oceans Alive! for middle and high school students. Come join the fun!

It Could Use A Little Salt…A New Approach to Teaching Food Webs
Mr. Eric Simms, Rutgers Marine and Coastal Sciences, New Brunswick, NJ
C ~ M,H,I ***2:00-3:45 pm; Kupa'a 203***

Tired of using the same bland methods to teach about food web dynamics? If so, consider spicing things up with a new marine science-based approach. A collection of online, interactive lessons have been developed at Rutgers Marine and Coastal Sciences to promote student understanding of the transfer of energy and matter between organisMs. Students are engaged in a top-down approach that starts with what is familiar and conceptually accessible – macroorganisms – and builds towards a greater understanding of the interdependence of life, including the more abstract concepts of microorganisms and primary production. Additional activities introduce the importance of microbes to all life on earth by promoting basic microbial biology and ecology concepts via an understanding of the marine microbial loop.

1.31 Miles Below Sea Floor – It Isn't Science Fiction: Science for Your Classroom from the Integrated Ocean Drilling Program
Matt Niemitz, Joint Oceanographic Institutions/Integrated Ocean Drilling Program, Washington, DC
L/HO ~ M,H,C ***2:00-3:45 pm; Kupa'a 204***

Join the scientists and crew of the JOIDES Resolution as they explore what really lies beneath the sea as we introduce the latest video, lab and classroom actvities. Designed primarily for high school marine science, biology and chemistry, this suite of activities can also be adapted for middle school earth science and introductory oceanography. Clear as mud? You might be pleasantly surprised!

Concurrent Sessions ~ Thursday, 14 July, 2:00-3:45 & 2:00-5:00 pm

Oceans and Human Health
Dr. Lisa Pitman, University of Miami - Rosenstiel School of Marine and Atmospheric Science, Miami , FL
Terry Pitman
L/HO ~ E,M,H,I,A,G ***2:00-3:45 pm; Laulima 101***

Microbial contamination of water can be an issue for both marine and freshwater sources. Session participants will participate in hands-on activities and will receive lesson plans which will include basic factual information about water quality necessary to knowledgeably lead class discussions and guide students' research efforts. These plans provide links to relevant current websites and articles. This primer also contains a glossary which contains definitions for scientific and conceptual terms used in the activities. Hands-0n Activities1) Create a MicrobeIn this investigation, participants will construct models of microorganisms recognizing size relationships - comparing the size of viruses with the sizes of bacterial cells.2) Classify the MicrobesIn this activity, participants will use a taxonomic key to identify microorganisms. Participants will classify bacteria, protists, and viruses using a classification key.

New Bedford Whalers in Hawaii.
Mr. Robert Rocha, New Bedford ECHO Project, New Bedford, MA
D/L ~ M,H,I ***2:00-3:45 pm; Laulima 102***

Ships from New Bedford, MA, traveled the globe in the 1800s and early 1900s in search of their quarry: bowhead, right, humpback, gray and sperm whales. Their multi-year trips into the Pacific brought them to island countries, including the Sandwich Islands (Hawaii) for supplies and new crew. This presentation, a condensed version of our middle school program, "Why Aren't There Whales in Buzzards Bay?" delves into the experiences of New Bedford whalers in the islands and the science of why Buzzards Bay doesn't attract whales.

The Whys and Hows of Building Research and Evaluation into Marine Science Exhibit and Program Design
Dr. Shawn Rowe, Oregon Sea Grant, Oregon State University, Newport, OR
Jessica Cardinal, Alicia Christensen
D/L ~ C,R,I,A,grad students ***2:00-3:45 pm; Laulima 226***

Have you ever wondered how to build effective evaluation or research on learning into your programming from day one? Have you ever wondered why you would even want to? Through its Free-choice Learning Initiative, Oregon Sea Grant is committed to building research and evaluation into all of our informal education opportunities. We will present three on-going research and evaluation programs we are invested in currently: an evaluation of our new exhibit The Invasion of the Habitat Snatchers, a project to work with local Native Americans to develop a traveling exhibit on Sea Otter, and research to develop tools for evaluating outdoor environmental educational activities. Time will be set aside for participant discussion and question and answer.

The Inquiry Connection: Building Science Knowledge and Comprehension Strategies using Inquiry-Based Marine Science and Non-fiction Books for K-8 students
Ms. Catherine Halversen, Lawrence Hall of Science, University of California Berkeley, Berkeley, CA
L/HO ~ K,E,M ***2:00-5:00 pm; Laulima 103***

Participate in this hands-on session and discover the remarkable connection between inquiry-based science and reading. Participants will experience hands-on inquiry-based science from the MARE (Marine Activities, Resources & Education) program from UC Berkeley's Lawrence Hall of Science as well as explore a brand new curriculum, Shoreline Science from the Seeds of Science• Roots of Reading project from GEMS (Great Explorations in Math and Science). Discover how you can combine marine science activities and informational texts to build students' comprehension strategies and science knowledge. Participants will receive copies of the activities used in the session and handouts directed at using expository or non-fiction readers in K-8 classrooms.

Hands-on, Ocean Data Visualizers for classrooms and museums from NASA satellites
Ms. M. Sara Tweedie, NASA Oceanography Program, Kensington, MD
Dr. H. David Snyder, Gallaudet University and NASA, Goddard
C,L/HO ~ H,C,I,A ***2:00-5:00, Laulima 212***

Research the latest, on-line data of Earth and discover water and wind forces that power weather and climate. Review in-depth classroom-ready investigations that help high school students practice science, mathematics and writing skills matched to national standards. Examine 24 years of Sea Surface Temperature data and find El Nino patterns. Hold onto your hat through 6 years of QuikSCAT satellite data in the Wind Visualizer and find your favorite hurricane or monsoon. Be among the first to experiment with the Ocean Basin Model and learn Henry Stommel's thoughts about Western Boundary Currents including the Gulf Stream. Try out the Ocean Surface Currents Visualizer and explore why Columbus landed in the Bahamas and not present-day New York City. Give us your opinion about the new Ocean Surface Currents CD/web-site.

Concurrent Sessions ~ Thursday, 14 July, 2:15-4:30 & 2:30-2:50 & 3:00-3:20 pm

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Fish Tagging to Foster Public/Private Partnerships for Science, Conservation, Management, and Future Generations.
Mr. Clayward Tam, Hawai'i Division of Aquatic Resources, Honolulu, HI
Mark Mitsuyasu, Western Pacific Fishery Management Council; Scott Furashima, Kewalo Keiki Fishing Conservancy
F ~ E,M,H,C,R,I,AP,G ***2:15-4:30 pm; Off campus***

The program is angler-based using volunteer fishermen to assist the State with the capture, tag and release of fish species known as ulua and papio, also commonly referred to as jacks. Ulua and papio are an important recreational fisheries, however, little information is available on the life history, biology, and habitat requirements for these species. Through partnering and sharing of data between fishermen, scientists, fishery managers and others, values that promote respect, stewardship and responsibility toward the marine environment and ocean resources are passed on. Meet in front of Ka'a'ike Lobby.

Two Years In: An Assessment of the NOAA Local Fisheries Knowledge Pilot Project's Impact
Dr. Susan Abbott-Jamieson, NOAA Fisheries, Silver Spring, MD
Jennifer Ise; Dr. Julie Bartsch, Rural School and Community Trust
S ~ H,C,A,P ***2:30-2:50 pm; KaLama 104A***

The Local Fisheries Knowledge (LFK) Pilot Project (2003:00-2005) just completed a two-year experiment in place-based learning in two Maine high schools focused on student exploration of their communities' social, economic, and natural connections to the marine environment. The students interviewed local people who are involved in fishing or the marine environment in some significant way, transcribed the interviews, and then archived them in a publicly accessible on-line database developed and maintained by National Oceanic and Atmospheric Administration-Fisheries (NOAA Fisheries) (http://www.st.nmfs.gov/lfkproject). Developed and funded by NOAA Fisheries, the Rural School and Community Trust, an education NGO, worked directly with teachers to develop and implement a place-based curriculum around the project framework. Presenters will discuss outcomes for students, teachers, and the local communities.

Santa Cruz Island Field Study: How You Can Get There Too!
Ms. Sherri Garcia & Ben Brandes, Seabury Hall, Makawao, HI
S ~ E,M,H ***2:30-2:50 pm; KaLama 108***

Come and join a 20 minute snapshot of the 2004 Santa Cruz Island National Marine Field Study. The four-day excursion was shared by teachers and students from around the country and filled with a variety of amazing activities. The study focused on catching the true essence of the Island through photography. You'll see a photo slide show created by the students and hear a Maui student's firsthand view of the experience. The partnership between the National Marine Sanctuarys and National Geographic lends itselt to some very exciting adventures! You'll want to be a part of it and you'll find out how in this session.

M.A.R.E. and Storytelling at Chabot Elementary
Ms. Nancy Kaminskas & Linda Lee, Chabot Elementary, Oakland, CA
S ~ E,M,I,A,G ***3:00-3:20 pm; Ka'a'ike 105B***

Six years ago Chabot Elementary became a MARE school. MARE is an interdisciplinary marine studies program based at the Lawrence Hall of Science in Berkeley, CA. Four years ago we added a storytelling component to our program. We would like to present how we have implemented and expanded our program.Every year in the Spring we set aside a couple of weeks as Ocean weeks. During this time the whole school participates in grade level studies of the ocean. Teachers become experts in specific interactive lessons. Once they have taught their class, they rotate to teach the other classes at their grade level. In addition during Ocean weeks we invite various performers and organizations to share their knowledge of the ocean with our students.

Weren't There More of Us?
Ms Cecilia Romero, Baldwin High School, Wailuku, HI
L/HO ~ M,H,C,I,A ***3:00-3:20 pm; Laulima 107***

Why are the populations declining for so many marine animals in the nearshore waters of Hawai'i? This interactive lesson, which is part of the Ho'ike o Haleakala curriculum project, explores some of the causes.

Concurrent Sessions ~ Thursday, 14 July, 3:00-3:20 & 3:00-3:45 pm

The Great Lakes and Human Health
Laura Florence, Center of Excellence for Great Lakes and Human Health, Ann Arbor, MI
S ~ K,E,M,H,C,R,I,A,P ***3:00-3:20 pm; Science 10A***

The Center of Excellence for Great Lakes and Human Health at the Great Lakes Environmental Research Laboratory (GLERL) is currently researching ways to provide accurate ecosystem forecasting of Great Lakes water conditions and quality. The outreach work is going to reach a variety of stakeholders- beach monitors, lifeguards, water resources managers, public health officers and the general public. Share your success stories and experience in water education and outreach in this interactive discussion section and influence the outreach activities of this exciting Center! A short presentation will focus on the activities of lab research related to water quality, harmful algal blooms and beach closures.

Marine Biotechnology and Bioinformatics for Teachers
Dr. Simona Bartl, Moss Landing Marine Laboratories, Moss Landing, CA
D/L ~ M,H ***3:00-3:45 pm; Ka'a'ike 105CD***

Our program of inquiry-based education in the marine sciences uses biotechnology and bioinformatics in summer workshops, develops curricula and provides classroom support for 7-12 teachers and students. Teachers learn how biotechnology is used to address scientific questions and how resultant data are analyzed. They develop project-based learning multimedia lesson plans during the academic year with the assistance of on-line support, classroom visits and periodic meetings. Teachers return for a second summer to present their learning activities and hone their project-based learning activities with a class of students. This program serves regional schools, the majority of which have over 80% of students identified as benefiting least from available information technology. We plan a next step expansion to other coastal areas.

Taking a Bite Out of Stereotypes: Sharks vs. Dolphins
Mr. Jim Wharton, Smithsonian Marine Station, Fort Pierce, FL
D/L ~ E,M,H,I,A,G ***3:00-3:45 pm; Ka'a'ike 107***

Shark populations are plummeting worldwide, and yet we can't seem to generate an appropriate level of outrage from the general public. Dolphins don't have the same trouble. Neither do whales. People are falling over themselves to save sea turtles. Why? It's all about stereotypes. It's about public perception and what people *think* they know about marine animals. This session is not about conquering stereotypes, but rather embracing them—using their inherent power as leverage. We'll discuss why we feel like we do about sharks, and how to use those ingrained cultural attitudes to metamorphose shark skeptics into elasmobranch advocates. Along the way, we'll also offer scientific proof that sharks really are cooler than dolphins.

Educating for Hawaii's Coastal Stewardship at Hanauma Bay Nature Preserve
Ms. Elizabeth Kumabe Maynard, University of Hawaii Sea Grant, Honolulu, HI
D/L ~ I,A,G ***3:00-3:45 pm; Ka'a'ike 108***

Hanauma Bay Nature Preserve is one of Hawaii's premier nature attractions that services over one million visitors each year who come to enjoy the accessible reef life and natural history of this urban marine preserve. The City and County of Honolulu's Education Center with interpretive exhibits and a mandatory natural history video are only part of the Education Program run by the University of Hawaii Sea Grant Extension Service. Management strategies develops resource stewardship of the living reef and offers a wonderful opportunity to learn and educate in this urban nature preserve. This session will offer a viewing of the exciting video and an introduction to the education programs and resources that were developed and are offered to Hawaii's community and visiting school groups.

How do we know what Albatrosses eat?
Ms. Jennifer Stock, Cordell Bank National Marine Sanctuary, Olema, CA
Carol Keiper, Oikonos Ecosystem Knowledge
L/HO ~ E,M,H,P ***3:00-3:45 pm; KaLama 109***

Albatrosses are far ranging predators that cross the Pacific Ocean regularly for breeding and foraging. Analyze the contents of a bolus (undigestable material), learn about albatross diets, and discover all the amazing things these seabirds collect from the open ocean. We will introduce an activity packet that uses experimentation and data analysis skills to learn about the prey selection of these mysterious wanderers.

The GLOBE Program: Uniting students and scientists in studying the environment
Mr. John McLaughlin, The GLOBE Program, Ft. Collins, CO
D/L ~ K,E,M,H,C,R,I,A,P ***3:00-3:45 pm; Laulima 225***

This presentation will give an overview of the GLOBE Program (www.globe.gov) and highlight and demostrate GLOBE offerings that may be of interest to the marine education community. GLOBE allows students, teachers, and the local community to work with scientists to perform environmental research. GLOBE students and volunteers have collected over 12 million measurements which are publicly-available from the GLOBE database.

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AUDIENCE(S): K=Preschool/Kindergarten; E=Elementary;M=Middle School; H=High School; C=College; R=Research Scientists; I=Informal Educators; A=Aquarium, Zoo, Museum Educators; P=Agency Personnel/Policy Makers; G=General

Unusual and interesting meteorological jobs within the National Weather Service
Mr. Joel Cline , National Weather Service, Honolulu, HI
D/L ~ H,C,R,I,A,P ***3:00-3:45 pm; Science 11A***

A recent ship grounding in O'ahu created a lot of public concern. I was assigned to be an on-site meteorologist to aid in getting the ship safely off the reef. Other unusal jobs required flying just after a typhoon to assess the services and damages, yet others led me to being one of 5 meteorologists to forecast with the NWS for the Salt Lake City Winter Olympics in 2002. Forecasting at the National Hurricane Center presented a great deal of interesting days - living through Hurricane Andrew and others.

Exploring Methods of Best Practice fors an Aquarium Environmental Education Centre
Mr. Russell Stevens, Two Oceans Aquarium, Cape Town, , South Africa
P/R ~ E,M,H,C,I ***3:00-3:45 pm; Science 12A***

Since the 1960s much effort has been made by operators at environmental education centres to find the most appropriate approaches for their work. In this paper the operations at the Two Oceans Aquarium's Education centre are described as a case study. This illustrates the variety of programmes offered to students from a diverse range of entry levels. Reflection on the education programmes shows that the tasks of developing activities that inspire the desired outcomes is intricate, requires constant evaluation and further development. In South Africa we need to evaluate the education programmes offered in such Centres which are integral components of public aquariuMs. A model currently being used to evaluate the Two Oceans Aquarium's programmes is described.

Advancing Education Through Environmental Literacy
Ms. Tina Held, Marine Academy of Technology and Environmental Science, Pt. Pleasant, NJ
D/L,L/HO ~ E,M,H,I,G ***3:00-3:45 pm; Science 20A***

In the current educational arena, assessments are designed to not only measure students' knowledge of facts but also their ability to write well, think critically, solve problems, and integrate content knowledge. This instructional approach is an example of using science and the local environment as an integrated context for learning and for assessment. Using science, environment, and the community as a focal point, educators can integrate subject-area knowledge and skill development. Teachers teach and students can learn individual state standards-based subject matter, build thinking and problem-solving skills, and develop basic life skills such as cooperation and interpersonal communication, as well as appreciation for the natural world.

Ocean Energy
Dr. Becky Cox, TEAMS - Tennessee Educators of Aquatic and Marine Sciences, Hollow Rock, TN
L/HO ~ E,M,I ***3:00-3:45 pm; Science 21A***

Learn about energy resources in, under, and over the ocean! The ocean environment has both renewable and nonrenewable energy sources. Ocean resources may be able to meet many of the nation's energy needs as new technologies are developed Participants will execute selected hands-on activities correlated with National Science Standards (Intermediate Level). Build models of stationary and floating oil rigs, and explore oil seeps. The activities are from materials created by the National Energy Education Development Program and the Mineral Management Service (US Dept. of Interior). Participants will receive information about how to obtain free or inexpensive materials.

Where Do We Grow from Here?: Lessons on Population and Carrying Capacity
Dr. Padgett Kelly, Middle Tennessee State University, Murfreesboro, TN
L/HO ~ E,M,H,I,A ***3:00-4:45 pm; Hale 218***

The latest U.N. projections show world population growing by 50 percent within the next 50 years. This continued growth in human numbers puts undue strain on our marine habitats and fisheries. In this hands-on workshop, participants will explore innovative ways to teach students about population growth trends, natural resource use and a concept vital to biology and environmental science - carrying capacity. Participants will engage in inquiry-based activities that build understanding of growth trends for humans and non-human species, including limiting factors and fertility trends. They will then explore the relationships between population growth, resource consumption and environmental health. Presented strategies include cooperative group problem solving, graphing and analysis, and role-playing simulations. Participants will receive activity instructions, data charts and background reading on a user-friendly CD-Rom.

Concurrent Sessions ~ Thursday, 14 July, 3:00-4:45 pm

Building Ocean Stewardship through Community Partnerships
Ms. Linda Chilton, Cabrillo Marine Aquarium, San Pedro, CA
D/L ~ E,M,H,I,A,G *3:00-4:45 pm; Ka'a'ike 109*

By embracing the larger community, Cabrillo Marine Aquarium provides opportunities for community groups and individuals to build a stronger sense of responsibility for the ocean. The program options begin with school workshops, weekend and after school programs, and progress to internships and formalized volunteer programs. Through partnering with other agencies and organizations, we have been able to provide opportunities for the public to become involved and to share a passion of caring for the ocean. These community partnerships allow students to Clete service learning obligations and develop a sense of stewardship for the coastal environment.

Florida BEST (Building Expert Science Teachers): Improving Science Education for Early-Career Teachers through Marine Science Field Studies
Mrs. Paula Nelson-Shokar, Miami-Dade County Public Schools, Homestead , FL
D/L ~ M,C,I *3:00-4:45 pm; Ka'a'ike 105A*

Concerns over high turnover rates and chronic attrition of early-career science teachers resulted in receiving the Mathematics and Science Partnership (MSP) grant. This unique collaboration, known as Florida BEST, includes Miami Dade College and the Miami Museum of Science. The program provides rigorous and extensive professional development, and on-going coaching and mentoring, to new science teachers from Title I schools. At local informal science institutes participants engage in inquiry-based science field studies. These opportunities take teachers beyond the textbook to learn about local marine issues, human impact, the creatures that inhabit our shores, mangroves, and coral reefs and the overall coastal environment. This in turn provided the tools and experiences they needed to engage their students in science field studies.

Tsunami Education: Learning from Hawaii's Tsunami Experience and Teaching Lessons that Save Lives
Dr. Walter Dudley, University of Hawaii at Hilo, Hilo, HI
L/HO ~ E,M.H.C.I.A.P.G *3:00-4:45 pm; KaLama 103*

ThIS workshop will include explanations of the science of tsunamis, real-life human stories from the tsunami events in Hawaii in 1946 through 1975, and the Indian Ocean tsunami of December 26, 2004. Samples of tsunami education materials will be shown and copies of materials distributed. This will be followed by an open discussion on what is still needed to best educate students and the general public about the tsunami hazard.

Ocean Literacy through Science Standards
Ms. Sarah Schoedinger, NOAA - Office of Education & Sustainable Development, Washington, DC
Francesca Cava, National Geographic Society;
Craig Strang, University of California at Berkeley, Lawrence Hall of Science;
Peter Tuddenham, College of Exploration
P/R ~ K,E,M,H,C,R,I,A,P *3:00-4:45 pm; KaLama 104A*

Ocean sciences were left out of the National Science Education Standards and most state standards, resulting in a decline in the public's attention to ocean issues. National Geographic Society, COSEE, NMEA, NOAA and the US Commission on Ocean Policy have all called for the inclusion of the ocean in science standards as a means to increase ocean literacy nationwide. There has never been consensus, however, about what ocean literacy is and what concepts should be included in standards to achieve it. Last October, an on-line workshop on "Ocean Literacy through Science Standards" attempted to develop this consensus. Come review, comment on and contribute to the resulting documents and discuss strategy for next steps in our efforts to turn the tide.

Voyage on the High Seas: A NASA/JPL Oceanic Adventure
Mrs. Annie Richardson, NASA/Jet Propulsion Laboratory, Pasadena, CA
L/HO ~ M,I,A *3:00-4:45 pm; KaLama 104B*

This workshop includes a short presentation on how NASA/JPL is using satellites to study global ocean phenomena including sea-level height, near-surface winds, and currents and provides an overview of several oceanography education products developed by the Education and Public Outreach team for JPL's Jason satellite altimeter mission. Participants then get to play the Jason board game (which doubles as an educational poster) and try to be the first to sail their research vessel from the Mediterranean Sea to Seattle while gaining the requisite discovery points. All participants receive a free game.

Concurrent Sessions ~ Thursday, 14 July, 3:00-4:45 & 3:30-3:50 pm

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Reef Rendezvous: A Comparison of Coral Reef Systems
Ms. Kelly Drinnen, Flower Garden Banks National Marine Sanctuary, Galveston, TX
Cathy Sakas, Gray's Reef National Marine Sanctuar;
Mary Tagliareni, Florida Keys National Marine Sanctuary
L/HO ~ E,M,H,I,A ***3:00-4:45 pm; KaLama 107***

Participants will learn how corals live and grow to produce reefs, then use this knowledge to deduce the habitat requirements for corals, identify how physical ocean currents can affect reef diversity, and consider how human actions can alter habitats, thereby impacting reef health. They will then compare and contrast reef systems located in three different National Marine Sanctuaries and discuss the roles these elements play in determining which species thrive best in each location. Two hands-on activities will involve participants in modeling coral reef structure and evaluating the impact of watersheds and ocean currents. Participants will receive a CD containing the workshop presentations, a coral reef curriculum, and still images and video clips from each of the sanctuaries.

National Marine Sanctuaries Live!
Michiko Martin, NOAA's National Marine Sanctuary Program, Silver Spring, MD
Claire Johnson
D/L,P/R ~ M,H,C,R,I,A,P,G ***3:00-4:45 pm; KaLama 108***

NOAA's National Marine Sanctuary Program enCasses more than 150,000 square miles of America's ocean and Great Lakes waters and works cooperatively with the public and partners to protect and manage sanctuaries and enhance public understanding of the ocean. In partnership with the JASON Foundation and Institute for Exploration, we have established an educational and technological framework to bring the nation's underwater ecosystems to students through "Telepresence." This initiative features an internet-based Ocean Science Education Portal that integrates live video with diverse environmental data streaMs. This presentation will describe the Portal, preview its prototype, review a taped "live dive" event, and provide audience members the opportunity to provide feedback that will influence future development of the Ocean Science Education Portal.

Protected Marine Species for Teachers and Students
Ms. Molly Harrison, NOAA, Silver Spring, MD
C ~ K,E,M,I,A ***3:00-3:45 pm; Laulima 227***

Realizing that education is the key to changing attitudes about the marine environment, the NOAA Fisheries' Office of Protected Resources has developed and gone live with a website for teachers and students. The site offers information on marine species, lesson plans linked to national standards, backyard science activities, teacher and student literature lists, and connections to other marine education websites. The session will navigate the website and introduce educators to materials available online to help them understand protected marine species issues, as well as identify resources for use in the classroom. There will be hard copies and CDs of various materials available at the session and at the Protected Resources table in the exhibition room.

Bringing The Floor to the Table: Ocean Floor Features in a Carton
Mrs. Linda Livolsi, Hamden Middle School, Hamden, CT
L/HO ~ E,M,A ***3:00-4:45 pm; Science 22A***

I will use milk or juice cartons, clay, styrofoam and labels to create 10 ocean floor features in a mock "mini" ocean. Participants will also receive instructions for follow-up/enrichment activities. Some of these include ways to contaminate their "mini" oceans and opportunities for their students to clean them up. Also, students can use lead lines to measure and map the ocean depths with fish line and sinkers. Later, they can create contour maps with their d

Exploring Pollution Effects in an Urbanized Estuary Using a Hands-on Undergraduate Laboratory Experiment
Dr. Jeffrey Ashley, Philadelphia University, Philadelphia, PA
S ~ H,C,R,P ***3:30-3:50 pm; Ka'a'ike 105B***

Using a multi-week, hands-on format, undergraduate science majors from Philadelphia University assessed the extent of chemical contamination and potential for toxicity of sediments collected from the John Heinz National Wildlife Refuge (Philadelphia, PA), which encompasses Pennsylvania's largest remaining tidal marsh. Students used the "sediment quality triad" approach which 1) evaluates the levels of pollutants in the sediments, 2) assesses the biodiversity of organisms in those sediments, and 3) quantifies the "toxic potential" by performing a 10-day toxicity test using benthic organisMs. By partnering with an agency, students had a heightened sense of ownership and enthusiasm for the project, knowing that others may use their data to address environmental concerns within the refuge. Educators may use all or some of the components of the triad and the partnership experience as a novel and highly applied means to educate students about the effects of chemical pollution in urbanized wetlands and estuaries.

Concurrent Sessions ~ Thursday, 14 July, 3:30-3:50 & 4::00-4:20 & 4:00-4:45 pm

Learning Ocean Science through Ocean Exploration: Connecting Classrooms to Ocean Frontiers
Mr. Timothy Birdsong, National Oceanic and Atmospheric Administration, Office of Ocean Exploration, Silver Spring, MD
S ~ E,M,H,C,R,I,A,P ***3:30-3:50 pm; Laulima 107***

Learning Ocean Science through Ocean Exploration is an ocean science curriculum developed by NOAA's Office of Ocean Exploration. The curriculum consists of lesson plans developed for NOAA Voyages of Discovery and the Ocean Explorer Website (http://oceanexplorer.noaa.gov). Lessons provide hands-on, inquiry-based activities that include background information for teachers, links to interesting Internet sites, topical essays, and compelling imagery and video. This presentation will highlight lessons and materials developed specifically for NOAA exploration and research voyages conducted in the vicinity of the northwestern Hawaiian Islands. Teachers will be shown how to incorporate the Ocean Explorer Website into each grade-level specific lesson, providing students with a direct connection to scientists and the exciting new discoveries of NOAA Ocean Exploration.

Marine Education Discoveries in South Australia
Tim Hoile, Marine Discovery Centre, Henley Beach, South Australia
D/L ~ K,E,M,I,A ***3:30-3:50 pm; Science 10A***

The Marine Discovery Centre has developed a number of outstanding teaching resources that would be a valuable aid for any classroom. The just released Marine Storybooks include many ventures that have emanated from the Centre itself. This is an opportuniy to discover different ideas for your own teaching. The Marine Discovery Centre has a new vision enabling it to provide for more visitors. The Centre is currently booked out two years ahead and is unable to keep up with the current demand. The new vision includes many exciting interactive ideas involving environmental sustainable concepts.

Academic achievement project in Oregon.
Mrs. Vicki Osis, Oregon State University, Seal Rock, OR
S ~ G ***4:00-4:20 pm; Hale 217***

The comparison of US and European high school students achievements in science and math is the root of many education reform efforts. This presentation compares math and science achievement, societal expectations, and focuses on the huge gap in number of hours of instruction between US and European schools. The presentation will also compare requirements and expectations of students upon graduation and efforts to introduce some of those requirements in Oregon.

Marine Biology Computer Simulations & Visualizations
Dr. Thomas Speitel, Curriculum Research & Development Group, University of Hawai'i, Honolulu, HI
Thanh Truc Nguyen
S,C ~ G ***4:00-4:20 pm; KaLama 204***

Computer simulations and visualizations let students experience aspects of key science concepts and processes. The short computer programs and movies that will be presented were designed to augment already outstanding high school courses in Calculus, Science Research Seminar, and Marine Biology offered by Department of Defense Education Activity instructors around the world. Topics cover aspects of population and ecosystem dynamics, sampling techniques, statistical tests for difference, anatomy, and evolution. Titles include "Food Chain," "Food Web," "Logarithmic Growth," "Observation Grid," "Dunaliella Sampling," "ANOVA," "Chi-Squared," "T-Test," "Tilapia Anatomy," and "Whale Morph."

'Aliomanu Limu Restoration Project
Kalei Arinaga, Pikoi - Kaua'i Learning Center, Kealia, HI
David Boynton
D/L ~ G ***4:00-4:45 pm; Agriculture 104***

'Aliomanu Limu Restoration Project is a unique Place-Based Learning Project designed by students and teacher, Kalei Arinaga of EXCEL School at Kapa'a Elementary School on Kaua'i. 'Aliomanu Bay on Kaua'i provides a context for environmental learning focusing on the restoration of Manauea Limu. This project focuses on the concept of "Malama I Ke Kai" and engages all students in problems they can relate to in the communities, provide Celling content for investigation and inquiry, and give students opportunities to formulate their own points of view. Students' work focuses on community interests as kupuna serve as mentors and together have discovered that local focus has the power to engage students academically, pairing real-world relevance with intellectual rigor, while promoting genuine citizenship.

Engaging Parents in Their Children's Science Learning : The Family Science Program
Mr. Bill Hastie, Foundation for Family Science, Portland, OR
L/HO ~ K,E,M,I,A ***4:00-4:45 pm; Hale 216***

Family Science is a promising informal science education program for elementary and middle schools that gives parents and children an opportunity to work and learn together. Explore Family Science goals, strategies, and materials, as well as the basics for holding a Family Science event at your school or site, in this active, hands-on presentation. Family Science materials are available in both Spanish and English.

Concurrent Sessions ~ Thursday, 14 July, 4:00-4:45 pm

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Promoting Best Practices for Educators in the Collection of Marine and Freshwater Organisms
Mr. George Shipp, Florida Fish and Wildlife Commission, Cedar Key, FL
D/L ~ E,M,H,I ***4:00-4:45 pm; Ka'a'ike 105B***

The presentation will explain the issues and concerns that arise when educators go into the aquatic ecosystems to collect organisms for classroom aquaria. The attendee will learn how the state approaches the issue and the measures taken to insure that educators comply with all regulatory contraints. Additional information will be given about tools and resources available to educators to help them use the resources in a responsible manner.

Biotechology Curricula for High Schools
Ms. Laura Duffy, Kamehameha Schools, Honolulu, HI
Dr. Jo-Ann C. Leong, Director, Hawai'i Institute of Marine Biology;
Vicki Osis, Oregon State University
D/L ~ H ***4:00-4:45 pm; Ka'a'ike 105CD***

This presentation will review new biotechnology curricula developed through a joint Hawaii and Oregon Sea Grant project. Teachers from both Oregon and Hawaii shared in the preparation of the curricula. Geared for high school students this curricula is unique in that it offers different levels of activities on a given subject from introductory level to biotechnology laboratories

Aboriginal Knowledge and Science Education Research Project
Dr. Gloria Snively, University of Victoria, Victoria, BC, Canada
L/D,P/R ~ E,M,H,C,G,science ed ***4:00-4:45 pm; Ka'a'ike 107***

Currently there is an extremely low participation rate of Aboriginal students enrolled in academic science courses in the BC school system. This creates barriers and limits choices in career opportunities. This presentation will discuss how Aboriginal researchers are proposing to find ways to significantly improve Aboriginal student involvement in science classes leading to post-secondary education and science related occupations. The research projects will draw on the wisdom, knowledge and experience of First Nations elders and community members to identify both science content elements of Aboriginal knowledge, as well as culturally appropriate and effective ways of teaching and learning science.The intent of these research projects is to strengthen the connection of Aboriginal children to their land through the elders as a means of improving their science knowledge.

Using DNA to bring Elakha (sea otter) back to Oregon; a story, a plan and a classroom activity.
Mr. Larry Hurst, Catlin Gabel School, Portland, OR
D/L ~ M,H,I,A ***4:00-4:45 pm; Ka'a'ike 108***

In their day, large beds of kelp provided a diverse abundance and protection for Oregon's coastal environment. The sea otter Elakha was the only predator of the near shore herbivores. When we lost Elakha, uncontrolled urchin populations decimated our kelp beds and wrecked the balance of the near shore ecosystem. In this presentation we will briefly connect and describe Elakha ecology, Lewis and Clark's secret mission and current DNA analysis of Oregon midden bones. I will present a new hands-on activity using beaded jewelry to demonstrate how the Carison of sea otter DNA sequences may help resource managers determine the appropriate subspecies of Elakha for successful reintroduction to Oregon's coast.

Shark Science for your Class
Ms. Carol Preston & Christy Walker, Gulf of the Farallones, San Francisco, CA
L/HO ~ E ***4:00-4:45 pm; KaLama 109***

Today's workshop will focus on hand's-on shark activities designed for your classroom. Your students will become shark scientists by studying video footage of sharks feeding and then recording their observations to learn more about white shark behavior. A cooperative shark classification activity will further heighten your students' observation skills. You will receive an assortment of handouts and information to help you incorporate these activities into your science curriculum. The GFNMS program successfully piloted its new outreach program, the Sharkmobile, this fall. The Sharkmobile is a classroom-based, hands-on program for fourth, fifth and sixth graders designed to teach them about sharks and shark conservation.

Concurrent Sessions ~ Thursday, 14 July, 4:00-4:45 pm

Marine Careers: How do you answer your students when they ask…
Ms. Deidre Sullivan, Marine Advanced Technology Education Center, Monterey, CA
Tami Lunsford, Jill Zande
C ~ E,M,H,C,R,I,A,P,G ***4:00-4:45 pm, Kupa'a 203***

How do you answer your students when they ask… What are all the ocean-related career options? How much money will I make? What knowledge and skills do I need to enter these careers? Where can I go to find the education I need? Who will hire me? Learn everything you ever wanted to know AND MORE about how to prepare your students for success in ocean-related occupations. OceanCareers.com is a project of COSEE California and is funded by the National Science Foundation. This website is the most extensive of its kind accessing large data-bases on careers, higher educational institutions, professional societies, ocean-related employers and extensive knowledge and skill sets. This hands-on workshop will demonstrate how to use the site to incorporate career information into classroom activities.

Dive and Explore with ROPOS
William Hanshumaker, Hatfield Marine Science Center/Oregon State Univ., Newport, OR
D/L ~ M,H,C,I,A ***4:00-4:45 pm; Kupa'a 204***

ROPOS (Remotely Operated Platform for Ocean Science) is designed to capture specimens and video down to a depth of 5000 meters. You will see stunning underwater videos captured during February, '04 off the Marianas, showing for the first time interactions between photosynthetic and chemotrophic ecosystems.You will also experience an interactive simulator that incorporates Cuter-generated graphics with authentic deep-sea video captured at Axial Mount, located three hundred miles off the coast of Oregon and Washington. Participants will receive a CD with interactive educational curriculum from the NOAA/VENTS program.

Creative Multifaceted Approaches to Engaging Students, Teachers, and Volunteers in Easy, But Effective Science Activities
Sara Peck, University of Hawai'i Sea Grant College Program Extension Service, Kailua-Kona, HI
D/L ~ M,H,H,C,R,I,A,P,G ***4:00-4:45 pm; Laulima 101***

The ocean users on the Big Island of Hawai'i are not willing to see their coral reefs destroyed. What has developed is and outstanding example of coral reef ecosystem conservation though community involvement. This effort resulted in landmark legislation leading to a regional fisheries management area and subsequent marine resource management changes. Some of the cross-generational activities include ReefTalk, ReefWatch, ReefTeach, and Aloha Ka

Animal Tribe- online curriculum for kids 8-12
Ms. Ariadne Green, Animal Tribe, Lahaina, HI
C,D/L ~ E,M,IE ***4:00-4:45 pm; Laulima 102***

A multimedia presentation of AnimalTribe.com, interactive curriculum all about animal totems for kids 7-12. The pages are full of fascinating reading aimed at helping children understand their connection to the animal kingdom. Several marine animals are featured including turtle, shark, whale, and seal. Lesson plan for how to construct a totem pole.

The Lost City Expedition: Exploring the Ocean through Telepresence Science
Ms. Paula Keener-Chavis, NOAA Office of Ocean Exploration, Charleston, SC
D/L ~ K,E,M,H,C,R,I,A,P,G ***4:00-4:45 pm; Laulima 107***

Join Drs. Bob Ballard and Deborah Kelley this summer, Ballard from aboard the NOAA Ship Ronald H. Brown and Kelley from her command center at the University of Washington in Seattle, as Ballard's dream of "telepresence" science is realized 700 meters below the surface of the ocean at the Lost City hydrothermal vent site on the Mid-Atlantic Ridge. In a scientific first, video and other live data streams will be transmitted from this unique vent site, discovered by Dr. Kelley and her colleagues in 2000, to "inner space centers" at the University of Rhode Island and the University of Washington, where teams of scientists will study and interpret the data. This presentation focuses on the science, technology, and NOAA's Office of Ocean Exploration and The JASON Foundation's education and outreach offerings supporting the mission.

University of Hawaii Marine Option Program- Experiencing Marine Education
Mr. Jeffrey Kuwabara, Marine Option Program, University of Hawai'i at Manoa, Honolulu, HI
D/L ~ C,R,I,A,P,G ***4:00-4:45 pm; Laulima 225***

The University of Hawai'i Marine Option Program (MOP) is an innovative experience-based interdisciplinary ocean education program that has a 34 year track recork of success. A combination of academics and "getting wet" is the key to moving students upward and onward. To earn a MOP certificate, students must complete 12 credits of marine-related coursework and a 3 credit internship or research project. MOP organizes marine-related field trips and activities to introduce it's students to a range of opportunities Hawaii's ocean community has to offer. Its summer coral reef monitoring class "Quantitative Underwater Surveying Techniques" (QUEST) has been training reef surveyors for over a decade and is a prime example of MOP's role as a productive estuary for Hawaii's marine professionals. This presentation gives a broad overview of a cutting edge program whose alumni permeate Hawaii's ocean fabric.

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More Than Meets the Eye: Vision in Large Hawaiian Pelagic Fishes A Bridge Data Activity
Ms. Lisa Lawrence, Virginia Sea Grant Marine Advisory Program, Gloucester Point, VA
Susanna Musick; Susan Haynes, Consortium for Oceanographic Research & Education
L/HO ~ H,C,R,I ***4:00-4:45 pm; Laulima 226***

When it comes to ability to see their prey, there's more than meets the eye for some large pelagic fishes. Some of these fish hunt near the surface, while others dive to great depths to find prey. At depth, low light conditions, little to no color distinction and cold temperatures can all affect a fish's ability to see. Scientists working off Hawai'i have discovered that the physiology of the eye in several species is adapted to these varying environmental conditions. With this Bridge data activity, we'll look at the physiology and life history of four pelagic fish species to find out just what and how they see.

Blue Water Task Force: Maui students testing for *Enterococcus* bacteria in near shore waters. Part 1
Ms. Jan Roberson, Surfrider Foundation, Maui Chapter, Haiku, HI
L/HO ~ H,C,I,A,P,G ***4:00-4:45 pm; Science 20A***

The Blue Water Task Force begins with a 20-minute PowerPoint Presentation that covers the sampling and testing process to determine the presence of a bacteria common to the intestines of all mammals, *Enterococcus*. The presentation is followed by hands on performance of the tests, discussion, and question-answer period. Surfrider will bring near shore water samples from a variety of beaches, lab equipment and testing supplies. An incubator regulated to 41 degrees celsius and test results are read 24 hours later, which would take 20 minutes for participants to read, record, and discuss findings.

Caught in the Drift: Sea Beans and Currents
Ms. JoAnne Powell, North Carolina Maritime Museum, Beaufort, NC
Terri Kirby Hathaway, North Carolina Sea Grant;
Kent K. Hathaway, US Army Corps of Engineers
L/HO ~ M,H,I,A,G ***4:00-4:45 pm; Science 10A***

Discover the magic of sea beans during this hands-on session. Sea beans and drift seeds float on currents around the world's ocean, landing on beaches near and far. Some drifters end up far away from their native soil and lucky beachcombers claim them as treasure! How did they end up where they did? Where did their trip begin? During this activity, learn about different species of sea beans, their origins, their final destination, and the currents that they used for transportation. Incorporate oceanography, botany, geography, math, and more into this fun, multidisciplinary exercise that you can duplicate in your classroom.

Be A Sea Star - Opportunities for Youth at the National Aquarium in Baltimore
Ms. Kathy Siegfried, National Aquarium in Baltimore, Baltimore, MD
D/L ~ I,A ***4:00-4:45 pm; Science 11A***

Through a wide variety of formal and informal programs, the National Aquarium in Baltimore is training the next caretakers of the environment – students! What can students do at the National Aquarium in Baltimore? Plenty! Try on a career. Earn community service hours. Teach elementary schoolchildren. Learn about marine life. And that's just for starters. Learn about these programs and how they can be incorporated at your organization.

Vote with your Fork! And Other Ways to Bring Sustainable Fisheries & Aquaculture into the Classroom
Habitat Media, San Rafael, CA
Film ~ M,H,I,A ***4:00-4:45 pm; Science 12A***

Captivating video, fresh activities, and discussion questions fuel Habitat Media's Sustainable Fisheries and Aquaculture Resource Pack, a downloadable companion guide to our PBS documentaries, "Empty Oceans, Empty Nets" & "Farming The Seas". Videos include breath-taking visuals and compelling interviews with some of the world's top marine scientists, conservationists, industry leaders, and commercial fishermen. Rivkah Beth Medow, Co-Producer with Habitat Media, coordinated the creation and development of a companion Sustainable Fisheries and Aquaculture Resource Pack for Habitat Media's PBS Marine Fisheries Series. Designed for use in 7-12th grade classrooms where time is typically limited, the SFA Resource Pack engages students with topics such as bycatch, fishing gear, ecosystem interdependence, antibiotics in our food supply, invasive species, and the concept of sustainability. And even if they're not 18, your students can learn how vote…with their forks!

Concurrent Sessions ~ Thursday, 14 July, 4:00-4:45 & 4:30-4:50 pm

The Fluid Earth and The Living Ocean
Ms. Mary Gray & Erin Baumgartner, Curriculum Research & Development Group, Honolulu, HI
L/HO ~ H,I ***4:00-4:45 pm; Science 21A***

The Fluid Earth and The Living Ocean (FE/LO) were developed by the Curriculum Research & Development Group (CRDG) of the University of Hawai'i as part of the Hawai'i Marine Science Studies (HMSS) Project. The program consists of multiple teaching and learning components, which, together, form a substantive program for marine science education at the high-school level. The project has developed over twenty instructional units, which include student laboratory and field investigations, teacher guides and supplementary reference materials. The program addresses the full spectrum of students' abilities and interest levels while maintaining academic integrity. The FE/LO also meets national and state content, teaching, assessment and professional development standards. Come learn about this program and new developments that enhance instruction for high-school students in marine science.

The Role of Communication and Education in Meeting Marine Protected Area Objectives
Ms. Katie Blayney & Geoff Wescott, Deakin University, Anglesea, VIC, Australia
S ~ C,R,I,A,P ***4:30-4:50 pm; Hale 217***

An integral part of managing Marine Protected Areas (MPAs) is communicating to its users and the broader community the existence of the protected area and its regulations. Education and communication are the main ways that management agencies inform the broader community about the protected areas and the regulations governing their management. Communicating to the broader community the existence of an MPA is achieved through signs, brochures, self guided or ranger walks. These are developed by education experts within management agencies. Yet little is known of the public's level of knowledge about MPAs or the marine environment. This presentation will discuss the importance of this knowledge for creating effective communication strategies.

The School Web of Instructional Media, Future Directions
Ms. ThanhTruc Nguyen &Tom Speitel, Curriculum Research & Development Group, University of Hawai'i, Honolulu, HI
S,L/HO,C ~ G ***4:30-4:50 pm; KaLama 204***

The World Wide Web is a great resource, but wading through the tides of information can be daunting and time consuming. The School Web of Instructional Media (SWIM) is a Web-based searchable database that allows for easy access by students and teachers to different instructional media. The purpose of the session is to introduce marine educators to SWIM, share its quick textbook-media connections, and communicate future directions. Currently, media referenced in SWIM are linked to specific pages in The Fluid Earth and The Living Ocean, part of the Hawaii Marine Science Studies Project (HMSS), an award-winning multidisciplinary science course set in a marine context for grades 9 -14. Media in SWIM include images, pictures, video, and interactive animations and simulations.