

current

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special issue featuring

HO'OHANOHANO I NĀ KŪPUNA PUWALU AND
INTERNATIONAL PACIFIC MARINE EDUCATORS CONFERENCE

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Front Cover: Courtesy of ©Western Pacific Regional Fishery Management Council. The poster for the Ho'ohanohano I Nā Kūpuna Puwalu (Honor Our Ancestors Conference) was created by Oliver Kinney, a gifted Native Hawaiian artist and illustrator. It captures the kaona (concealed meaning) of Ho'ohanohano I Nā Kūpuna and depicts the knowledge handed down through generations of lawai'a (Hawaiian cultural experts and practitioners of traditional ocean and fishing methods).



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current

THE JOURNAL OF MARINE EDUCATION

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CURRENT LOG This issue of Current features two landmark conferences hosted by the Western Pacific Regional Fishery Management Council. Under the Magnuson-Stevens Fishery Conservation and Management Act, the Council manages fisheries in offshore waters surrounding the State of Hawaii, the Commonwealth of the Northern Mariana Islands, the Territories of American Samoa and Guam, and eight U.S. remote island possessions—nearly half of the U.S. exclusive economic zone. The Council has developed fishery ecosystem plans and supports holistic approaches to fisheries management that embrace both scientific and traditional knowledge and encourages community involvement, as well as international cooperation in resource management decisions.

The Ho'ohanohano I Nā Kūpuna Puwalu (Honor Our Ancestors Conference series) gathered kūpuna (elders), cultural practitioners, educators, policymakers, and community-based activists from every district in Hawai'i. The unprecedented event advanced the quest for long-term protection, restoration and sustainability of Hawai'i's land and sea resources, and advocated for Hawaiian culture, traditional knowledge, and generational practices throughout the archipelago.

The International Pacific Marine Educators Conference brought together marine educators from 18 countries to share resources and promote the health of the Pacific Ocean and the communities who depend upon it. The conference featured nearly 60 on-site and real-time, web-delivered presentations from areas spanning the East Coast of the United States to Papua New Guinea. The conference resulted in the creation of the International Pacific Marine Educators Network (IPMEN), which aims to facilitate real action in marine education and highlight the need for ocean stewardship across the Pacific.

KITTY M. SIMONDS has served more than 20 years as the executive director of the Western Pacific Regional Fishery Management Council. She joined the Council following a 13-year career as an aide to U.S. Senator Hiram L. Fong. Under her watch, the Council has set the pace for innovative marine resource management with its pioneer regulations on controversial gear, observer programs, vessel monitoring systems, and the nation's first ecosystem-based management plan.

SYLVIA SPALDING has spent 25 years using journalism and education to promote fisheries and marine conservation. She is currently the Council's communications officer; the chair of the OCEANIA chapter of the National Marine Educators Association (NMEA), which serves the Pacific Islands; and co-chair of the NMEA Traditional Knowledge Committee. She chaired the International Pacific Marine Educators Conference.

CHARLES KA'AI'AI has been the Indigenous Coordinator for the Council since 2000, working with indigenous communities in Hawaii, Guam, the Commonwealth of Northern Mariana Islands, and American Samoa. Prior to the Council, he worked with Hawaiian Homestead communities on community-based economic development and subdivision planning and with Hui Na'auao, a sovereignty education project.

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HO'OHANOHANO I NĀ KŪPUNA PUWALU

BY CHARLES KA'AI'AI AND SYLVIA SPALDING



THE WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT Council hosted the *Ho'ohanoHano I Nā Kūpuna (Honor Our Ancestors) Puwalu (conference) series* to engage Native Hawaiian communities in the development of the *Fishery Ecosystem Plan for the Hawai'i Archipelago*. To facilitate the identification of traditional practitioners and practices and the organization of the conference series, the Council contracted Leimana DaMate, who had been involved with the Office of Hawaiian Affairs (OHA) workshops with Native Hawaiian communities to promote the concept of *ahupua'a* management (natural resource management based on traditional geographic divisions that typically ran from reef to ridge).



Puwalu participants included the Keale 'ohana (family) of Ni'ihau. On this privately owned island, traditional lawai'a and mahi'ai (fishing and farming) are practiced by kūpuna (elder), makua (adult), and keiki (children) alike.

During meetings with Native Hawaiian communities, cultural practitioners who continue traditional natural resources practices and maintain traditional lifestyles and relationships with the natural environment requested that traditional resource management be incorporated into contemporary resource management and that education play a major role in this effort. The often heard mana'o (thought), "We want to teach our keiki (children) a practice, not a memory" became a motivation for the Puwalu. Kumu hula (hula teachers), cultural practitioners, and cultural consultants John Kaimikaua, Keli'i Tau'a, Kimokeo Kapulehua, and Frank Kawaikapuokalani Hewitt provided additional advice to the Council in the development of the Puwalu project. The goal of the series became to increase participation of the Hawaiian community in the conservation and management of Hawai'i's resources through the creation of a community and cultural consultation process within the contemporary educational and governance structures.

The Puwalu series was implemented by the Council in partnership with the Association of Hawaiian Civic Clubs (under the presidency of Antoinette Lee) and received support from the OHA, Kamehameha Schools/Bishop Estate, the State of Hawai'i through its various departments, the Hawaii Tourism Authority, and numerous community organizations and community projects throughout Hawai'i. The Puwalu were professionally facilitated by Annelle Amaral, Pat Brandt, Kuumealoha Gomes, and Miki Lee with assistance from Liko Hoe and Kaio Kaimikaua.



The island of O'ahu has six moku (traditional land districts), each consisting of several ahupua'a (land divisions extending from the reefs to the uplands).

Puwalu 'Ekahi (First Conference): No Na Laeula (Experts), August 15-17, 2006, in Honolulu, brought together more than 100 ahupua'a practitioners from all of Hawai'i's populated islands as well as Kaho'olawe. The participants discussed and proposed the development of 'aha moku (district councils) that would manage natural resources for the Native Hawaiian tenants

and the community through the implementation of site-specific cultural conservation and utilization practices. A resolution “to unite Native Hawaiians to move forward, to live, to grow, to gather together, to stand firm, and to restore and perpetuate the Hawaiian way of life” was passed and established a framework for the Puwalu series.



Resolution to unite Native Hawaiians to move forward, to live, to grow, to gather together, to stand firm, and to restore and perpetuate the Hawaiian way of life.

WHEREAS, more than 100 elders, parents, and youth—who are traditionalists, practitioners, and experts as well as lineal descendants of the original inhabitants of the islands Kure Atoll, Midway Atoll, Pearl and Hermes Atoll, Lisianski Island, Laysan Island, Mono Reef, Gardner Pinnacles, French Frigate Shoals, Hecker Island, Nihoa, Nihoa, Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii—met to honor our ancestors in the first of a series of these conferences;

WHEREAS, this first conference provided distinguished elders, practitioners, and experts a forum to discuss and share the cultural practices of the fishermen and the farmers from the ahupuaʻa of 45 traditional land districts of the Hawaii Archipelago;

WHEREAS, the participants acknowledged that the spiritual and physical well-being of indigenous people of Hawaii are intrinsically tied to the land and the sea;

WHEREAS, the participants recognized that the knowledge they share and hold reflects thousands of years of experience sustaining the resources of the land and the sea;

WHEREAS, the participants identified examples of impacts negatively affecting their access to, and the abundance and availability of, the natural resources;

WHEREAS, the participants reaffirmed to move forward together with one voice as lineal descendants and urge the Hawaiian people and supporters of Hawaiian culture to rise up to ensure the community's health, safety, and welfare;

NOW, THEREFORE, BE IT RESOLVED that those attending this conference call on Hawaiian people to begin the process to uphold and continue traditional Hawaiian land and ocean practices in the governance and education of the Hawaii Archipelago;

NOW, THEREFORE, BE IT FURTHER RESOLVED that the conference participants call for perpetuation and preservation of the knowledge of practitioners and the restoration of healthy ecosystems through furtherance of the ahupuaʻa management system, konohiki management, kapa, hoʻāloalo rights, and the reestablishment of pihā moku.

Finished is the stealing of the land, finished is the stealing of the sea, finished is the stealing of the life of the land. ... The people of the land shall rise up.

— Māhina prophecy

The resolution passed by the traditional practitioners and experts participating in Puwalu 'Ekahi (the first conference).

Puwalu 'Elua (Second Conference): Ke Kumu 'Ike (Educators), November 8-9, 2006, in Waikīkī, brought together cultural practitioners and educators from around Hawai'i to identify practical means for integrating Native Hawaiian science and traditional sustainability practices into the standard school curriculum statewide. The educators included Hawaiian language immersion specialists, charter school delegates, educators working in private school settings, and representatives from the Hawai'i Department of Education (DOE). To stimulate dialogue and provide guidelines for development of Hawaiian science curriculum, Kamehameha Schools developed for the Puwalu a lesson plan template and identified appropriate Science Content Area criteria (topics, benchmarks, and sample performance assessments) that meet the Hawaii DOE standards for grades K-7.

The cultural practitioners related their traditional values, fishing practices, and knowledge of site-specific resource management. They stressed the importance of sharing the knowledge they have acquired from their kūpuna (elders) with the keiki. The involvement of teachers in the school system was seen as essential to support 'ohana (family) efforts and to assist children who do not have kūpuna with this knowledge.

The educators believed that formally reestablishing an ahupua'a-based system of natural resource management would be challenging, but agreed that the goal could be attained and that education was a key to success. They discussed how to channel traditional knowledge into a sample curriculum for the schools. They suggested utilization of hands-on, experiential learning and lessons that are moku-specific. They felt that a program to train non-Hawaiian teachers how to teach cultural practices would be essential as well as guidance from moku-based resource groups. They suggested that converting vast amounts of traditional knowledge into lesson plans and teaching traditional knowledge and practices in the classroom would be challenging.

Challenges Teaching Traditional Knowledge and Practices in the Classroom

- How to categorize and manage an inventory of many and diverse cultural practices.
- How to decide what is the most essential to teach, and then how to teach it in a way that is age appropriate.
- How to standardize the terms used to communicate the curriculum.
- How to include the leadership at the top since the curriculum cannot all come from the ground level.
- How to devise a holistic approach to teaching that incorporates the needs of parents, neighbors, and the larger community.
- How to include this curriculum into a system that emphasizes Euro-American subjects.
- How to measure educational attainment of this type of knowledge.

The educators also identified difficulties in the existing educational policies that may hinder progress. These included gaining permission to bring unaccredited or non-certified teachers (kūpuna) into the classroom as instructors; obtaining permission from administrators for off-campus field trips (essential for hands-on, experiential learning); administrative concerns regarding liability; and administrative concerns about teachers meeting existing mandates for required subjects.

To mitigate obstacles, educators suggested that a policy statement from the DOE or the legislature be obtained to affirm the importance of teaching Native Hawaiian culture in the schools. The educators hoped that the DOE recognition of the practitioners' hands-on experience would resolve certification issues.



Puwalu 'Elua (the second conference) brought together traditional practitioners and experts with Hawaiian language immersion specialists, charter school delegates, and private and public school educators.

Educators stressed the importance of allowing students to gain credit for taking Hawaiian study classes if Hawaiian culture is not part of the core curriculum.

The second Puwalu concluded with a statement of affirmation from both educators and cultural practitioners. The educators agreed to develop lesson plans based on what they learned at the conference and to use them in the classroom; to continue individual research of their communities; to network and establish rapport with resource people in their communities; and to create a list serve for sharing resources, books, curriculum ideas, and lesson plans. The cultural practitioners, building on the Resolution of the first Puwalu, which called upon nā kānaka maoli (Native Hawaiians) to begin the process to uphold and continue traditional land and ocean practices in the governance and education of the Hawaii Archipelago, agreed to assist the teachers in establishing educational partnerships with cultural practitioners in their moku. As a first step, the practitioners defined nā hāna kūpono (the proper procedures) for seeking, receiving, and sharing knowledge.

NĀ HĀNA KŪPONO

Kekipa ana e kahui ana (visiting and meeting procedures)

1. Ho'omakaukau ana (preparing for the call and interview)
2. Ke kahea (proper introduction or call to the informant)
3. Ka ho'okupu (appropriate gift presented to the informant)
4. Ke kukakuka ana e kahuiana (discussion and negotiation)
5. kapanina e ho'okupu (closure)

Ka 'ike (sharing knowledge and understanding procedures)

1. Ka ho'omakaukau ana (preparation for sharing)
2. Ke ao mai ana (sharing knowledge)

3. Ka malama ana (agreement on how the knowledge will be used and protected)
4. Ke ao aku ana (instruction to the guest and sharing of knowledge)

Puwalu 'Ekolu (Third Conference): Lawena Aupuni (Policy-makers), December 19-20, 2006, in Honolulu, brought practitioners and educators together with government agencies and policymakers to discuss the development of an 'aha moku council system as a means to implement a consultation process to increase participation of the native community. Existing programs, their successes and challenges, and how an 'aha moku system can enhance community capacity building and improve statutes and ordinances were discussed. The participants agreed that more formalized communication and consultation between lawmakers and the Native Hawaiian community was needed at the county, state, and federal levels.



Timmy Bailey, mahi'ai from Kahikinui, Maui



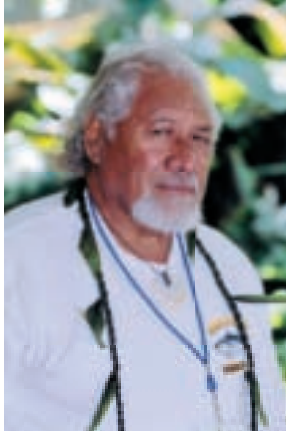
Winnie Basques, lawai'a from Lāna'i



Leslie Kuloloio, lawai'a from Kaho'olawe



Keeaumoku Kapu, lawai'a from Kaanapali, Maui



Kelilipoo Mawae, lawai'a from Kaluakoi, Moloka'i



Kaniāla Akaka, lawai'a from Kohala, Hawai'i



Gilbert Kahele, lawai'a from Hilo, Hawai'i, and Walter Paulo, lawai'a from Milolii, Hawai'i



Sol Kaopuiki, lawai'a from Koolau, Lāna'i



Tommy Hashimoto, lawai'a from Kilauea, Kaua'i



Kitty Simonds, executive director, Western Pacific Regional Fishery Management Council, and Leimana DaMate, from Ka'u, Hawai'i



Selaina Vaitautolo, an observer from American Samoa



Ka'oi Kaimikaua, lawai'a from Makakilo, O'ahu

Puwalu 'Eha (Fourth Conference): Kukula Ka 'Upena (Constructing the Net), April 10-11, 2007, in Honolulu, reassembled the practitioners to create a structure for an 'aha moku council system. The 'upena (fish net), a tool by which the Hawaiian people and culture flourish and prosper, was selected to symbolize this gathering. The participants began by identifying traditional ahupua'a boundaries and the families who historically and currently maintain those specific areas within a moku, as well as the critical issues facing individual moku on all islands.

To maintain their special unity and strengthen their focus, the practitioners adopted a mission statement: "To incorporate appropriate Native Hawaiian knowledge and protocols for the preservation, cultivation, and management of all Native Hawaiian natural and cultural resources for future generations." Penned by Timmy Bailey, a mahi'ai (cultural practitioner of farming) from



The creation of an 'upena (fish net) symbolized Puwalu 'Eha (fourth conference), which reconvened traditional practitioners to structure an 'aha moku council system.

Kahikinui, Maui, the statement served as the foundation for the work on the 'aha moku council system.

The participants agreed to move forward with one voice to establish an 'aha moku council system across the islands through the adoption of policy by lawmakers written specifically for that purpose. They discussed the establishment of 'aha moku based on information that was provided by Kumu John Kaimikaua. The system could conceivably have nā 'āha (councils) at the ahupua'a, moku, mokupuni (island), and state levels. Each council would be made up of community members of those areas and would have the kuleana (responsibility) to ensure that culturally appropriate management measures are implemented to conserve and utilize the resources within them. The 'upena took shape as the Native Hawaiian lawai'a (cultural practitioners of fishing) and mahi'ai solidified a community consultation process that would advise and make recommendations for the management of natural resources.

Through the Puwalu conference series the cultural community consultation process has started. The Hawaiian community is empowered with purpose. Native practitioners are networking. Policymakers are interested in having traditional practices contribute to natural resource management in Hawai'i. Lawmakers responded with legislation, Act 212 Relating to Native Hawaiians, signed by Governor Linda Lingle in June 2007 that created an 'Aha Kiole Advisory Committee to report to the legislature on best practices for traditional management of natural resources and community consensus on an 'aha moku council system. The Western Pacific Regional Fishery Management Council has information on traditional knowledge and practices to consider in development of the Hawaii Archipelago Fishery Ecosystem Plan, and a process to facilitate future consultation between the Native Hawaiian community and all levels of government is emerging.



Aha Kiole Advisory Committee includes (l-r) Jean Ilei Beniamina (Ni'ihau), Vanda Hanakahi, chair (Moloka'i), Winnie Basques (Lāna'i), Charles Kapua (O'ahu), Les Kuloloio (Kaho'olawe), Timmy Bailey (Maui), Sharon Pomroy (Kaua'i), and Hugh Lovell (Hawai'i).

MORE RESOURCES:

Act 212 Relating to Native Hawaiians:

http://www.capitol.hawaii.gov/session2007/bills/gm983_.pdf

Ho'ohanohano I Nā Kūpuna Puwalu Proceedings. Edited by Ed Glazier, PhD (in progress):

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PHOTO CREDITS

Page 2 (right): O'ahu moku and ahupua'a map courtesy of Kamehameha Schools

All photos courtesy of the Western Pacific Regional Fishery Management Council

OLI KA LAWAI‘A (A FISHERMAN’S CHANT) PUWALU ‘EKAHI (FIRST CONFERENCE): WRITTEN TESTIMONY

BY LESLIE AIPAENA KULOLOIO

Ke ike a ka lawai‘a he na ka upena
(The knowledge of the fisherman is absorbed by the net)

Slowly our voices of the ocean and cultural traditions will slip
between the crevices—hard to reach.

My Maui Hawaiian family has lived on Maui for many years. We
have been gathering and fishing six ahupua‘a for 10 genera-
tions or more.

We believe in keeping our lifestyles as simple as possible. We
love to plant and fish using our natural resources and food
resources within our ahupua‘a boundaries.

We struggle and strive like everyone else to ha‘a (chant), ma‘a
(practice, experience), pa‘a (adhere to) the living memories,
and place names—so our mo‘opuna (relatives two generations
later, whether blood or adopted) can go back to—if and when
they need to.

My children and I believe in keeping the spirit, pule (prayer),
and knowledge alive within the piko (navel) of our family. It is
not easy!

Everything about knowledge, subsistence, survival, and culture
begins and is taught at home—not the school.



Kamakahema Awa and son William P. M. Akau repairing a fishnet
(1918). Photograph by Tai Sing Lau.

We have a family imu (underground oven) in our yard and
continue to slaughter our pua‘a (pig) and kālúa (bake in the
imu) at least three times a year.

We have a family boat—26 feet—to holoholo (travel to)
our family ko‘a (fish aggregation areas) and buoys around
our moku pae ‘āina au kai (land and ocean)—including
Kaho‘olawe.



Throw net fishing. (ca. 1934-37). Photograph by N. R. Farbman.

We use our ‘upena (nets) when the time is right.

Choosing the lifestyle of a farmer or fisherman is not that easy.
I myself have chosen to find work in career advancement to
make ends meet. Now retired, somewhat.

It is hard to culture or to teach our children and mo‘opuna—
keeping things traditional and ‘ohana kakou (the family
together).



Honolulu Harbor (ca. 1885).



Hukilau (traditional seine fishing) at Hamoa, Hana, Maui (1936). Photograph by Harold Stearns.

The system we live under is foreign and continuing—impacting our Hawaiian ways of life.

The world is a bigger place than Hawai'i itself. The ahupua'a of yesterday is no more and gone.

Unfortunately, Hawai'i's way of life will continue to flow into foreign currents. Somewhere along the ocean edge—we didn't pay attention.

Hawai'i is now in a new era and time. It's all about economics, supply and demand—and immediate cultural convenience.

The word ahupua'a is a haole (foreign) and non-spiritual term by definition.

Greed and impatience has begun to hai (kill) the gills of our fishing families.

Our land and ocean are subdivisions breaking at every knot.

Now currents separate us from each other.

The eyes of our nets no longer have a purpose ...
The au (movement) and leo (voice) of our ocean have no piko (center).
We continue to slip between the crevices—hard to reach.

LESLIE AIPALENA KULOLOIO, a treasured kupuna, sits on the 'Aha Kiole Advisory Committee as the Kaho'olawe representative. Les has ancestral and cultural connections through both of his parents' genealogy to Kaho'olawe, which was used by U.S. military as a bomb and munitions testing site from 1941-1990. Les has been involved with the Kaho'olawe Conveyance Commission, Kaho'olawe Island Reserve Commission, Protect Kaho'olawe 'Ohana, Cultural Resource Management Plans and Land Use Committee, NOAA and the Protect Kaho'olawe 'Ohana Fishery Studies, and the Maui-Lāna'i Island Burial Council.

PHOTO CREDIT

All photos courtesy of Bishop Museum

BUILDING BRIDGES THROUGH EDUCATION

PUWALU 'ELUA (SECOND CONFERENCE): KEYNOTE ADDRESS (DAY 1)

BY COLIN KIPPEN

I WANT TO MAKE A CONFESSION. *I am not a traditional practitioner. I do not survive through subsistence practice. That is not my background, but I am Native Hawaiian and I have spent a good deal of my life fighting to preserve and protect Native Hawaiian practices. In fact, not only Native Hawaiian practices, but Native American practices.*

We're here for two reasons. Number one, I want to talk just a little bit about this whole idea of rights, because that's what we always end up talking about. It's why we're here. It's why we've come. It's about exercising our native rights. The other thing I want to talk to you about is education, because education is absolutely a key. It's a bridge. It's a common ground.

The first thing is Native Hawaiian rights. We're trying to protect the right to practice traditional and customary ways of gathering and living off this 'āina (land), off these waters, off these streams. It is also about our being able to continue our relationship with this land and with these waters and with all of the creatures that live there. It's about us being able to maintain our relationship to these places, not only to the resources that are there, but the places that are there.

When you talk about what a right is in Western law, it always gets down to an interest that the law says must be protected. If you're Native Hawaiian, you have certain rights, and it's like a bubble. It's a bubble that surrounds you. And when you bump into somebody else and their bubble, and they impact upon your bubble, they've invaded something that you have a right to. It's something that protects you. It's something that exists as though it's an appendage to your body. That's my idea of what a right is, and we do have Native Hawaiian rights. It means you have a right and the ability to act in a specific way to a given resource, to a given place, because of who you are.

Over the years, I've learned a lot of things about native rights. I haven't only learned them here, because although I was born and raised here, I ended up going away to school. When it was time for me to come back here, I came back looking for work. I had a stack of rejections. I could not find work in this town. I ended up living on the mainland. I ended up living there for a number of years. I ended up working with Indian tribes in the Pacific Northwest. I became a judge for some Indian tribes. A lot of what we were doing there is exactly what we're trying to do here. It's just that in some ways I think they're a little bit further along because there's an acknowledgment of their status, their status as a self-governing entity within federal law. I've had some experience about seeing it there.

Then I came home. We are confronting, basically, the same kinds of issues. Here are some things that I learned along the way:

If there is a resource, there is a practice associated with that resource. If you want to know if there's a practice, identify the resource. And, if we have done a good job of capturing the history and the mana'o (knowledge, thinking) behind that resource, capturing the stories and the verbal history of it, we will find what that practice is.



Henry Chang-Wo, lawai'a and Puwalu participant from Ewa, O'ahu, is co-founder of a community project to replant limu (seaweed) that hold subsistence and cultural value to Native Hawaiians.

Second thing I learned, different Native Hawaiian practices exist in different places. One size does not fit all. I wanted to talk about this later, but I want to make this brief and I want to make sure I get it in. So I want to tell you this, we have our practice and it may not be the same in one part of the island versus another part of the island.

You often hear the current regulators of that resource, the government entities, say: "You know, we're really trying to work with you folks, but you've got one way of doing this over here and another way over there, and we're really trying hard."

My response is: "I'm really glad you're trying hard. Try harder." Because that's what this is about. It's about our connection to the resource, and it's time for us to step up. This is that part of the big step that has happened now.

The third thing I learned, government regulation is pervasive over our resources and the things we depend upon to live. There is a divide. There is an issue that separates us from ourselves. One of the big issues is that many Native Hawaiians do not understand what the practice is. So what ends up happening? Things are said like—and I am paraphrasing a discussion that just happened at our Association of Hawaiian Civic Clubs, where there was a great debate that raged on for about three days. It finally culminated with everybody coming together, being of one mind, finding common ground, building a bridge with each other. Let me tell you how the debate went.

One civic club said we ought to approve the DLNR's (State of Hawaii, Department of Land and Natural Resources) ban on gill netting. Another group said we need to protect the practices of Native Hawaiians. So there we are, two groups, all Hawaiians, arguing amongst themselves. I looked at that. What I realized was going on there was this, for those people who said, we need to adopt this—we need to endorse what the DLNR is doing, in their mind they didn't see anybody else. They looked around and they didn't see anybody else that could do it. We were sitting in a room full of Hawaiians, and I'm thinking, look in the mirror. But, that's their view. Because from their perspective, we need to protect the resource right now, and we don't see any other group out there that has the capacity, has the ability, to do it. On the other side, you have the Hawaiians who are saying, this is a bad idea, this particular regulation is a bad idea. Why? It substantially impacts Native Hawaiian people. Why does it impact it? Because you aren't even aware of the things that you are affecting how we live, how we exist, how we fish. What they were saying, which was different from what the first group was saying, protect the Native Hawaiians' ability to exercise kuleana (responsibility) and you will protect the resource. The other group was not going to the kuleana place first. They were going to just protect the resource. We'll let you do it DLNR. We believe in you.

I am a skeptic. There's a difference between a skeptic and a cynic. A skeptic looks at something and says: You know, okay, prove it. A cynic just says, no matter what you do, I'm never going to believe you. You know, I was born under a dark cloud, and I don't believe anything anybody tells me. I'm not a cynic. I'm a skeptic. But I am very skeptical of regulation, government regulation. Somehow natives always get tangled up in it. We always get tangled up in it, and we end up in a position where we have to defend our right to even access that resource and protect and practice our traditional ways.

The last thing—and this is probably the most important—and maybe if there was one thing I would hope you would remember about what I said today is this: It's about maintaining

our connection to this resource. That's one of the things that I've learned. It's always about maintaining our relationship to that natural resource, whether it be your family, an individual, your community, your ahupua'a, your moku, it's always about us being able to maintain that relationship to our resource. Because once you sever that relationship, you will basically have people who don't know, don't understand, don't care, and we will lose something in our hearts and we all know that.

So, the big thing here, as we go through this, the thing that we've learned, is that we need to come together to establish what are these best practices. It's important that we establish what these practices are. That is what this Puwalu (conference) as well as the Puwalu before and the Puwalu in the future will be about. Best practices will be the common denominator. It's what will unite all of us. We have to be able to figure out what those best practices are. You're sharing that. We have to understand that these best practices are really part of the way of expressing our kuleana. We express our kuleana through this best practice.

Let me tell you again, I'm not a traditional practitioner. But when I think about people who are traditional practitioners, it makes my heart full, because if there weren't traditional practitioners out there, I would lose something. I would lose something that I can't even begin to put in words, and you all know exactly what I'm talking about.

This group, you are the practitioners. But there is a much larger population out there, and it is the people who feel just the way I do, it's my brothers, it's my cousins, and it's even my parents. Because my parents, although they're both Hawaiian, they never practiced traditionally. They may have gotten food from relatives at times. They may have gone limu (edible seaweed) picking. They may have fished. But in terms of full-on subsistence, they never did that. There are a lot of us like this, and there are a lot of people who don't have the koko (blood, native genealogy) who understand this as well. It is important to this place, these people, and who we are. So that's something I think is important.



At Heeia on the island of O'ahu, a Native Hawaiian community group works to restore an ancient fishpond to produce fish for consumption and to educate children and the community.

What I'm really talking about here is the need for us to figure out how to educate these other people, all of these other people, including ourselves. If we had done a better job of education at the Hawaiian Civic Clubs, you wouldn't have had this dispute; one saying yes, yes, we ought to support this ban on gill netting; and this other group saying, wait a minute, it makes no sense, it makes no sense, because we are caught up in that regulation. You are going to make criminals out of us practicing our traditional ways. But if we had done a better job of education, even within the 'ohana (family), we wouldn't have this issue. So, that's the challenge.

That's why you are being called upon today. The people that are being brought into this discussion are educators, and that's important. If we don't teach others, this relationship to the resource will be weakened. If we don't teach others, you are going to see Hawaiians continually moved out of the decision-making process. You're not going to be part of the equation. You're not going to be part of those people who get to say, and this is what is important, that this is the law and we expect you to live up to it. What it will do is cut us adrift from this place we call Hawai'i and what it means to us. So what do we have to do? What's the solution?

The first thing is we need to come together. You folks have come together. Because pulling together an event like this on such a short notice is not an easy task. It's difficult. It's confounded by the fact that all of you probably have jobs, all of you have families, you're coming from all over the state to participate in this, and it's not just one day, it's two days. It's important that it happen. We have got to get together, and we've got to establish our best practices. We have to establish what stewardship really means. When you think about what this whole idea of native rights is—Hawaiians don't know native rights, but Hawaiians know kuleana. A native right, if you have a native right, you have kuleana. If you have kuleana, that means you have a practice. If you have a practice, then you have traditions and customs that will live on. So, you talk about native rights in the Western sense, but really it's all about kuleana, about establishing your kuleana, about educating people about your kuleana, and about claiming your kuleana.

You've got to establish that practice that shows your relationship to that resource, to that place, to those waters, to those reefs, to those deep sea areas. I've heard talk by at least one agency that says Hawaiians don't have a deep sea practice. Maybe that's true. Maybe that's not. I'd like to hear a little more about that because it makes absolutely no sense to me.

There's this issue about documentation. Some of you should be a little nervous. In fact, everybody should always be a little bit nervous when we talk about documentation. Why? Because if you put up a list, you say my rights in this area, my practice is to do 1, 2, and 3; what will the regulators say to you when you say my right is 1, 2, and 3, my practice is 1, 2, and 3? If we

didn't put 4 on the list, if you didn't put 5 on that list, what about that one?

What we need to understand is that practice evolves. Practice does not stay the same today as it was one thousand years ago. Why? Things are not the same today as they were one thousand years ago. If you think that it is only about saying what the practice is and making the definitive statement about what my bubble is, my bubble of my native rights. Somebody comes and bumps into my bubble, right, that bubble is there to protect me. They're invading my space now. I have a right. You cannot bump into my bubble. It's my protection. That's the reality of what a right is. It protects you. I'm saying be aware of this idea of documentation, because it's not necessarily all of the details. It is the relationship that you are trying to establish, the relationship to the resource. So that as times change and circumstances change and conditions change, what happens to our practices? It's going to change, because if it doesn't change, we're stuck back in history.

We didn't create global warming. We didn't create all of this pollution and runoff. We didn't create these invasive species that have been introduced into our waters by, maybe, well-intended but negligent people. Look at what they're doing to our reefs. We didn't create all of that. But we should have the ability to respond to those changes, and that's why it's about your relationship. It's about the practice, the practice which establishes the relationship.

So as you discuss, and as you talk to the legislators in the future and as you talk to the community members, it's the relationship to the resource. That's the basis. Because if you go down the other trail, talk about the specific thing, the specific practice, it's in a book that we did 1, 2, and 3. What if you can't do 1, 2, and 3 anymore because the resource has changed? You go to the regulator and you say, "Wait a minute, we need to be able to do this." They'll say, "You never did that before. You never fished in that way before. You never fished with that kind of equipment before." Does this make sense? Do you understand where that discussion is going?

That's the power of this discussion. It's a perfect discussion. Your ears are open; hearts are open; everything is ready to roll. That's what this is about. This is going to go to the next level. This is a wave that is starting to build, and you are in it and you are the energy behind it.

That's the whole thing about documentation and the risks. But you folks already appreciate that. I was at the last Puwalu conference, and right at the end there was talk about the video, discussion about the video. People said, oh, wait a minute, I don't think so. Full-on waiver to use the video, I don't think so. We want to talk, we want to share, but I don't think so.

Today, at one of the later sessions, you're going to be talking about those things that may be confidential. You have to

put some thought into how you want to express the relationship, because the relationship is what you protect and those special practices. You've got to have a way to screen those, to protect them.

Now, let's talk about understanding. You've got to do three things here. You've got to document these things, people have to be understood and you've got to have enforcement. What about the understanding? How much understanding do we want to create here? What we really want is others to understand our kuleana, that we have a relationship here that needs to be maintained. It's a relationship to the place, a relationship to the culture, a relationship to the resource. It will be what sustains us.

The last one, it needs to be enforceable. The government needs to honor it. The government and the regulators need to be able to create rules that allow our practice to continue. The government needs to adopt a methodology or management regime that basically allows us to have a hand in managing the resource. Federal and state and city jurisdiction exists. The issue is going to be, how we create a moku-based, an ahupua'a-based system of management. That is a very heavy political agenda to lift. It is going to be difficult. It is not impossible. It is not impossible if education happens. Go back to the civic clubs discussion and you'll see exactly what happened. Our own Hawaiians didn't understand or appreciate that we have the ability to manage these resources. We have to be organized. It really is a movement. It is a progression. It is an evolution forward.

I'm not in education. I work for the Native Hawaiian Education Council. For most of my life, I have worked as an advocate for native people. That's been my thing. That's what I have wanted to do, and I've been really fortunate to have been able to do that. What I'm doing now is education. When you are advocating for a group, it's important work, but usually it's one client at a time, one issue at a time. When you educate, you just change the whole world. It happens because education opens hearts, opens minds, if it's done in the right way. It can change the world. What it does is fund things like Hawaiian language

immersion, cultural curriculum, early education, scholarships to college and to graduate schools, and vocational training. If you really want change, it begins with knowledge and education. If they knew the talent that's here in this room, if they all were exposed to this, how could people not say that our traditional ways are the right way? We have thousands of years of experience doing this. We know things that scientists will never learn. The thing of it is that there has to be a bridge, and the bridge is education. This is a huge task that is going to be very difficult for us to have this conversation.

We have approximately 60,000 Native Hawaiian students in the Department of Education, and many educators feel we can do a much better job of reaching and teaching those Native Hawaiian students. This is about building a bridge, capturing those best practices, those better ways of reaching and teaching our Hawaiians kids, and then giving that information back to those schools, those classrooms that want to know a better way of reaching and teaching Hawaiian kids. You're the people with the knowledge. You need to build the bridge with the educators. You need to build a bridge with the government decision-makers. You need to build a bridge with the general public. You need to build a bridge with us, Hawaiians. The last thing we need to do is build a bridge through education with our elected politicians.

COLIN KIPPEN is the executive director of the Native Hawaiian Education Council and holds an appointment from the U.S. Secretary of the Interior as a member of the Review Committee of the Native American Graves Protection and Repatriation Act. He is an advocate for Native Hawaiians and native people in general. Previously, he was senior counsel to the Senate Select Committee on Indian Affairs, deputy director of the Office of Hawaiian Affairs, judge for various Northwest Indian tribes, and a trial lawyer and prosecutor in Washington State.

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CALL FOR PAPERS

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CALL FOR A COMMUNITY AND CULTURAL CONSULTATION PROCESS PUWALU 'EKOLU (THIRD CONFERENCE): WELCOMING REMARKS

BY KITTY M. SIMONDS

IN 1962, THOMAS KUHN WROTE *THE STRUCTURE OF SCIENTIFIC REVOLUTION* and popularized the concept of a “paradigm shift.” Kuhn argued that scientific advancement is not evolutionary, but rather a “series of peaceful interludes punctuated by intellectually violent revolutions,” and in those revolutions “one conceptual worldview is replaced by another.” In other words, a paradigm shift is a change from one way of thinking to another. It’s a transformation that does not happen, but rather is driven by agents of change.

I welcome you today as those agents of change in Hawai‘i, ready to shift and advance the way we view and manage our natural resources. This change is being promoted by many of us because we are not blind to the signs that foretell destruction of our natural resources and our native culture unless something is done now. Our shift into the future is a step back to retrieve and revive the native culture of Hawai‘i that was supplanted by Western culture. It is a long overdue step to recognize the value of the culture that existed for millennia in these islands and which is embodied in the cultural practitioners who are gathered with us today. This valuable inheritance is available for all of us if we are willing to accept it.

Many of us have been working within the confines of our individual organizations to materialize this needed change from business as usual, which we all know has not and is not working. The Association of Hawaiian Civic Clubs and the Office of Hawaiian Affairs have spent the past five years working on the implementation of traditional and cultural practices into government policy. They have held approximately 40 community meetings statewide in this effort.

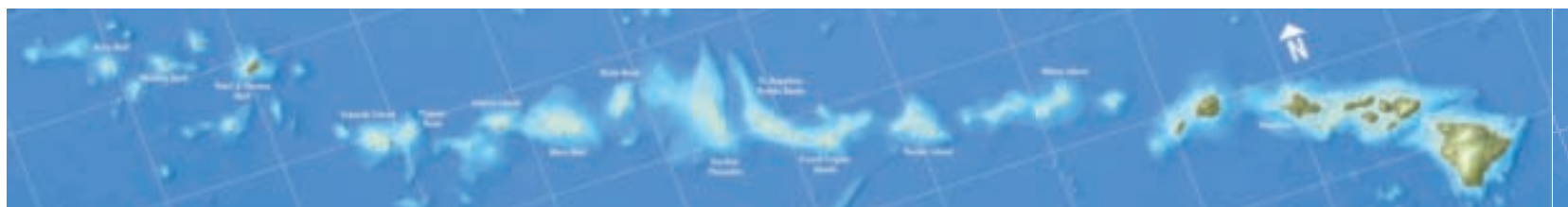
The Office of Planning has prepared a draft Ocean Resources Management Plan (ORMP) that calls for the establishment of moku councils that will provide for the wise use of Hawai‘i’s resources in a coordinated, efficient, and economical manner, and ensure comprehensive planning and coordination that will enhance the quality of life for Hawai‘i’s people.

The Hawai‘i 2050 Sustainability Task Force, chaired by Senator Russell Kokubun, was established in 2005 to address and guide Hawai‘i’s long-term sustainable future. The process seeks input

from businesses, government, and private citizens—from our keiki to our kūpuna. The Hawai‘i State Legislature, through Act 8 created this Task Force to review the Hawai‘i State Plan and its planning process. Its members are appointed by the Governor, and include the Senate President, the Speaker of the House, the Mayors of Hawai‘i, and the President of the University of Hawai‘i. In the statewide community meetings held in 2006, the public was asked to list and rate their most prevalent concerns in regard to sustainability. Integration of the ahupua‘a concept and ecosystem stability was rated as one of the highest.

Along those lines, the Western Pacific Regional Fishery Management Council, whose responsibility is to conserve and manage marine resources of the United States in the central and Western Pacific, has been working on an ecosystem approach to manage these resources. To accomplish this, the Council established the Hawai‘i Archipelago Fishery Ecosystem Plan (FEP), which includes a framework under which ecosystem-based management strategies can be implemented in the future. The U.S. Congress also mandates the Council to work closely with communities to develop appropriate policies that conserve marine resources, yet provide for continued use of those resources. In the reauthorized Magnuson-Stevens Fisheries Conservation and Management Act, recently adopted by Congress, the Council was also directed to “develop means by which local and traditional knowledge can enhance science-based management of fishery resources of the region.”

It is clear that a critical mass has been reached to initiate a paradigm shift in the way Hawaii views, relates to, and manages its natural resources. The time is here, today, now, to establish





a community and cultural consultation process that will allow communities to develop sustainable plans for their kuleana (properties/responsibilities within an ahupua'a).

The Council is hosting the Ho'ohanohano I Nā Kūpuna Puwalu to provide the Hawaiian people a forum to discuss their traditional ahupua'a practices and to facilitate the incorporation of this information into today's educational systems and framework for resource conservation and management in Hawai'i.

It is a great honor that Native Hawaiian cultural practitioners are willing to share the truths conveyed to them from their ancestors. This knowledge, these truths, cannot be lost. They must flourish and be adhered to so that future generations of Hawaiians can benefit. Together, we can find the way to protect Hawai'i's cultural legacy and to sustain our people and our island ways for the benefit of all of Hawai'i.

KITTY M. SIMONDS has served more than 20 years as the executive director of the Western Pacific Regional Fishery Management Council.

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USE OF TRADITIONAL PRACTICES IN PRESENT-DAY LAW PUWALU 'EKOLU (THIRD CONFERENCE): OPENING REMARKS (DAY 1)

BY WILLIAM S. RICHARDSON

THIS PUWALU (CONFERENCE) BRINGS TOGETHER THOSE WHO WERE INVOLVED *in the first two Puwalu gatherings—cultural practitioners and teachers—with policymakers from the state and county level. The goal of this Third Puwalu is to find ways to incorporate traditional cultural practices—practices that often come from and are most closely associated with moku and ahupua`a—into natural and cultural resource management laws and policies throughout our islands. This is certainly a worthy goal—and a daunting task!*

In considering what I could add to this discussion, I thought that I could draw upon my experience as a judge in attempting to ensure that Hawaiian cultural practices and traditions were reflected in the Hawai'i Supreme Court's decisions and, thus, in the law of our state. As you know, our courts have recognized that Hawai'i's laws relating to land and natural resources are unique in that they are based, in part, upon Hawaiian tradition, custom, and usage. This means that in many cases, we can look to the practices of our ancestors as guidance in establishing present-day law. Thus, it might be useful today to review with you some of the decisions that established these principles.



Hawaiian woman catching opae (shrimp) with a dip net at Napoopoo in Hawai'i.



Hawaiian people using a dip net to fish in tide pools in Hawai'i (1890-1905).

One of the first was the 1968 case of *In re Ashford*—dealing with a shoreline boundary. Many original grants from the Mahele described shoreline boundaries in general terms, using phrases such as “ma ke kai,” “along the sea, shoreline, or seacoast.” The exact meaning of these phrases was not established until the *Ashford* case. In that case, the court determined that according to ancient Hawaiian tradition, custom, and usage, seaward boundaries described as “ma ke kai” are located along the upper reaches of the wash of waves, as evidenced by the edge of vegetation or by the line of debris left by the wash of waves.

This decision was followed in 1973 by *County of Hawai'i v. Sotomura* (1973), in which, we examined property that had been registered in Land Court with a description of the property using azimuth and distance measurements. We determined that even with property that had been so registered and described, the “upper reaches of the wash of the waves” standard should be used to determine the shoreline boundary. The *Sotomura* case also established that where a seaward boundary is evidenced by both a debris line and a vegetation line lying further mauka (inland), the boundary is presumed to be the vegetation line. This meant that more of the beach would be available for public use.



A Hawaiian canoe and fish baskets (ca. 1890). Photographed by Charles Furneaux.

In a subsequent decision, *In re Sanborn* (1977), we reaffirmed our earlier decisions and determined that the seaward boundary of a parcel registered by the Land Court lay at the more mauka vegetation and debris line. Moreover, we held that in construing Land Court decrees, natural monuments such as "along the high water mark" are controlling over azimuth and distance measurements.

Following this series of cases, our State Legislature then enacted laws on shoreline boundaries to reflect the court's decisions, and the State Department of Land and Natural Resources enacted rules and regulations to implement the laws. I was delighted to see that recently, in interpreting these rules and regulations, our Hawai'i Supreme Court looked to the *Ashford* and *Sotomura* decisions to provide guidance on where the shoreline should be located (*Diamond v. State*, October 2006). In that case, the Supreme Court reconfirmed public policy in *Sotomura*.

I believe that the shoreline boundary situation presents a good example of how traditional and customary practice and knowledge has been judicially recognized and then incorporated into state statutory law and eventually adopted as management policy.

In other areas of law, the Supreme Court has also looked to Hawaiian custom and practice:

In *Palama v. Sheehan* (1968), we found a right of access to a kuleana parcel based, in part, on language in early Hawai'i deeds reserving the rights of native tenants and on the 1850 Kuleana Act reserving the "right of way" on all lands granted in fee simple.

In *McBryde Sugar Co. v. Robinson* (1973), we examined early Hawaiian water practices and determined that private ownership of such a precious resource was at odds with traditional Hawaiian practices. With this background, we looked at the intent of the

mid-eighteenth century laws surrounding the Mahele and transforming the communal land system into a private fee simple system. We found that the King intended to reserve the right to use water to himself *in trust* for the common good of all. Thus, we recognized that the public trust doctrine was consistent with Hawaiian practice and thought and adopted into our laws at the time of the Mahele itself.

In the 1978 case *In re Kamakana*, the court looked to Hawaiian practice and custom to determine that the grant of an ahupua'a would naturally include the fishpond attached to the ahupua'a—since Hawaiians viewed fishponds in the same way they viewed 'āina.

In *Kalipi v. Hawaiian Trust Co., Ltd.* (1982), we determined that gathering rights are protected by three sources in Hawai'i law:

- first, the Kuleana Act, now codified as HRS § 7-1;
- second, an 1892 law, HRS § 1-1, recognizing Hawaiian usage as an important exception to the common law; and
- finally, in Article XII, section 7, of the State Constitution protecting the traditional and customary rights of ahupua'a tenants.

The court held that lawful residents of an ahupua'a may, for the purpose of practicing Native Hawaiian customs and traditions, enter undeveloped lands within the ahupua'a to gather firewood, house-timber, aho cord, thatch, or kī leaf, all items enumerated in the Kuleana Act. The court also stated that pursuant to Article XII, § 7, of the Constitution, courts are obligated "to preserve and enforce such traditional rights."

We further stated that HRS § 1-1 ensures the continuation of Native Hawaiian customs and traditions not specifically enumerated in HRS § 7-1 that may have been practiced in certain ahupua'a "for so long as no actual harm is done thereby." We noted that the "retention of a Hawaiian tradition should in each case be determined by balancing the respective interests and harm."

Thus, with regard to shoreline boundaries, kuleana access, water resources, ownership of fishponds, and gathering rights, the court consistently looked to traditional and customary Native Hawaiian practice and use. These cases have also formed the basis for legislation, rules and regulations, and further judicial decisions.

One of the difficult questions courts have had to face in these kinds of cases is determining exactly what the Hawaiian practice or custom was and how it is expressed today. Long ago, our courts recognized that in ancient times certain people were taught the names and boundaries of each land division and that these people were repositories for this special kind of knowledge. So, the courts have allowed these kama'āina witnesses to testify in land and boundary cases.



Spear fisherman near Hana, Maui (ca. 1890).

In modern times, and in the cases I just discussed, we have allowed kama'āina witnesses to testify to the location of shoreline boundaries according to ancient Hawaiian tradition, custom, and usage; to the location of trails used by kūpuna; and more recently to gathering practices in specific areas such as Wao Kele O Puna on the Islands of Hawai'i. The courts have looked to "experts" in Hawaiian language—to mānaleo—to help determine the true meaning of certain phrases in Land Commission Awards and early deeds.

As all of you realize, traditional and customary practices can only be recognized by the courts and by policymakers if the practices remain vibrant and healthy and relevant to the lives of our people. We can only call upon mānaleo to interpret the Hawaiian language in old deeds and laws if our language continues to live; we can only find someone to testify as to the path used by hula folk who gather lehua and palapalai fern if hula continues to live, and the lehua and palapalai thrive; we will only know the right way to pick limu without killing off this resource if those who know teach those who are willing to learn.

This is why I was so encouraged to learn of the declarations and commitments made in the first two Puwalu held earlier this year. This first Puwalu of traditional practitioners called on the Hawaiian people "to begin the process to uphold and continue



Torch fishing with a dip net (1919). Photograph by Tai Sing Loo.

Hawaiian traditional land and ocean practices into the governance and education of the Hawaiian Archipelago." The second Puwalu, which included both practitioners and educators, met to "deliberate on how to incorporate traditional Hawaiian practices and knowledge into the daily education of Hawai'i's children." This third Puwalu tackles the difficult issues of how to incorporate traditional and customary practices into decisions and policies at the county and state levels.

For policymakers, I believe that you have the burden of balancing many different and apparently competing interests. You must balance the past and the future; the rights of the collective and individual; public interests and private interests; use of a resource with the risk that the use may deplete the resource; and Hawaiian customs and traditions with Western law.

You must make difficult decisions, but if you make those decisions with the counsel and advice from traditional practitioners and those who are most closely affected by and connected to a particular resource or area, your decisions will be sound. If you make your decisions based on traditional concepts of ahupua'a resource management, while being cognizant of the effects of your management decisions on the larger moku and on the entire archipelago, your decisions will result in a healthy and thriving resource and community. The



Weloka fishpond at Pearl Harbor, O'ahu (ca. 1910). Photograph by Stokes.



Hawaiian people cutting up a captured turtle, Hilo, Hawai'i (ca. 1890-1905).

best possible outcome for the resource, the Hawaiian people and all the people of Hawai'i.

As all of you continue your deliberations, I know that you will remember that whatever our individual interests and goals, we are linked together and to this land. Each of us struggles, in their own way, to retain within us the learning and wisdom of our ancestors. We walk that delicate balance between two worlds—the modern and sometimes impersonal society that surrounds us, and the highly personal and ancient culture we carry within us. The times ahead present great challenges and possibilities for Hawaiians. I believe that we can meet these challenges, if we maintain our link with the past and our hope for the future.

WILLIAM S. RICHARDSON served as Chief Justice of the Hawai'i State Supreme Court from 1966-1982, and subsequently, as a trustee of what is now Kamehameha Schools/Bishop Estate. Prior to these services, he was Hawai'i's Lieutenant Governor under John A. Burns; in the private practice of law; an advocate for statehood; and chairman of the Hawai'i Democratic Party (1956-1962). He is currently "in residence" at and involved with the continuing development of the state's only law school, the William S. Richardson School of Law at the University of Hawai'i, named in his honor.

PHOTO CREDIT

All photos courtesy of Bishop Museum

TAKING A SEAT AT THE TABLE

PUWALU 'EKOLU (THIRD CONFERENCE): OPENING REMARKS (DAY 2)

BY WALTER M. HEEN

LET ME COMMEND THOSE PERSONS WHO PUT THIS PUWALU TOGETHER. *I have attended many conferences and also arranged a symposium on sovereignty over 10 years ago. I know the work and stress that goes into producing this kind of assembly, and this is by far one of the best conceived and arranged that I have witnessed. The format of presenting the issues in three separate sessions was outstanding. It allowed for a logical progression from presentation of the mana'o (thoughts) of practitioners, to discussions with educators, and then this third Puwalu, a discussion with the policymakers.*

I was very impressed with the format used for the discussion yesterday and stimulated by Chief Justice Richardson's recapitulation of the history of Hawaiian rights in Hawaii's judicial system. I will touch on those matters later, but for now I would like to give you my mana'o (thoughts) on what I understand to be the underlying theme of the proceedings, what I see as its goals, what I think may be a rather serious shortcoming, and what I think you can do to overcome that weakness.

Even before going there, however, I need to file a "disclaimer." First of all, I wondered why I was invited to speak. Most of you know that I am not a practitioner. Neither am I learned in our history and culture. You see, I am what all refer to, some disdainfully, as an assimilated Hawaiian. What I know of the history and culture I have learned from books and discussions with persons who are less than "practitioners."



In old Hawai'i, there was a belief in the connection between the land and the sea and in 'ouli (signs and omens) related to fishing. When the 'ulu (breadfruit tree) had fruit, it foretold good fishing for squid.

So, let me explain how I got to this position as an assimilated Hawaiian. My father was born in 1895, two years after the overthrow, and three years before annexation. My mother was born in 1900. I was born in 1928, just 30 years after annexation. The effort of nearly all Hawaiian families was to learn the ways of the haole (foreigner) in order to fit into the world that they had

thrust upon us. I was born and spent a good part of my life in Ka'imuki, which was not a place where one witnessed much in the way of cultural practices. My grandparents had passed on. In fact, my Pākē (Chinese) grandfather had gone back to China to spend his remaining days. We had very little contact with my paternal grandmother's family, Meheula, in Lāhainā, and with my maternal grandfather's family, Hanapi, in Kamalo. So, in my generation we did not have the benefit of the knowledge of our kūpuna (elders). My mother spoke Hawaiian fluently, but never taught us. You know how the story goes.

So, what happened to me? Well, one day my father sat me down and said to me, "Son, you live in a white man's world, and you must play the white man's game, by the white man's rules. But if you do so, and make yourself as good as him, you can win that game. However," my father admonished me, "never forget that you are Hawaiian." And so, I did make myself as good as him, and I have won. And it feels good. But, nevertheless, I am Hawaiian—and proud of it.

With that background, I now turn to the mana'o on these proceedings, and what I anticipate can be done to further our cause.

I think the goal of establishing a base of cultural and historical knowledge of our heritage as the indigenous people of our islands—the kanaka maoli—is of extreme importance. I note from some presentations at the first Puwalu (conference) several admonitions that it is necessary to keep much of the knowledge and practices within the family, because it could be used to hurt the family. That caveat is undoubtedly important to our people. The other side of that coin, however, is that so much of this essential knowledge of our culture, and how it may differ from place to place has been lost and is in danger of becoming even rarer. Let me give you an example.

In 1993, I was the lead counsel for the Office of Hawaiian Affairs in the Waiahole Water contested case hearing. The thrust of our case was to establish the cultural importance of our streams. We needed to show not only the general history of instream uses by our ancestors but the unique history of particular streams,

Waiahole, in particular. We could find not one person who lived or had lived in Waiahole Valley and was familiar with the ancient cultural activities connected with the streams. We could find no one who could even remember gathering hīhīwai [endemic snail (*Neritina granosa*)] in the stream. We encountered that lack of knowledge in other places and on other matters. We need to preserve whatever knowledge we can.



'Auwai (irrigation systems) to water kalo (taro) patches in Manoa valley on the island of O'ahu are centuries old.

Yesterday, one participant asked why it was so necessary for us to promote the knowledge of our culture. The why is because it is extremely important if we are going to preserve what we have. We need to remember that, unfortunately, ours is not the only culture that is extant here. In fact, we are competing with the other cultures every day. We are not alone here. We Hawaiians need to find a means for placing our culture into the forefront and keeping it there. We have been less than vigilant in this regard.

I need to tell another story that you might also find illustrative. In 1939, before WWII, we lived in Aiea Heights. My father rented a cottage on our property to a young Navy couple stationed at Pearl Harbor, which was just down the hill. They lived as part of our family, and my mother, in true Hawaiian fashion, treated the wife like a daughter. They eventually moved away, but about 20 years ago they began coming back to spend Christmas and New Years with my family. Just the other day, the wife remarked to me, "I suppose that there are a lot of people who want to make Hawai'i just like the mainland?" I replied, "Yes. If they had their way we would just be another suburb of Los Angeles." She thought that was awful. I remarked to her that she was fortunate to have known the earlier, more beautiful, Hawai'i.

My point really is that we cannot go back, but we can influence what happens from now on. You are seeking empowerment of 'aha ahupua'a to influence activities within each ahupua'a. I suggest you go beyond that and make the entire archipelago an ahupua'a. We should prevail upon the legislature and other policymakers to establish a statewide policy that, before any

government permits are issued for development or exploitation of our resources, the developer should consult with the Native Hawaiian community in the area proposed for "improvement." This goes beyond the cultural impact statement.

I think my next point is very important. You need to have a seat at the table—every table that affects Hawaiian culture, heritage, customs, and traditions. Let me give you the perfect example of what I am talking about. I called Senator [Colleen] Hanabusa in response to a complaint she voiced in a newspaper interview about the lack of cultural awareness on the Water Commission and told her that the problem with the Commission's decisions was that the individual commissioners were required by law to have experience as large water users. That, of course, meant they came from plantations and other such industrial users. She added a cultural expert to the commission and the decisions improved.

I think the best example of what can be done with a seat at the table was evident in Chief Justice Richardson's historical discussion of the odyssey of Hawaiian rights, traditions, customs, and usages in the Hawaiian courts. Why the modern day awareness and protection of those rights? Simple answer: Hawaiians had a seat at the table—the Supreme Court bench. Not until the Chief Justice became a justice did those rights begin to flower. Before him the alien powers controlled the courts, and thus, controlled the outcome of such cases as *Oni v. Meek*. The Pash decision on gathering rights was penned by Justice Klein, a part Hawaiian. We need to get more Hawaiians on the bench. Here is how you can help.

I am president of Na 'A'ahuhiwa, an organization of retired state judges. We have undertaken to encourage our Hawaiian lawyers to apply for judicial appointment. Again, we need to be at the table. If you know Hawaiian lawyers or law students, encourage them to seek judicial appointment. It can only help.

Let me conclude by saying that I am a politician. I was probably a politician from conception. Don't overlook that endeavor. We need to elect more Hawaiians to office.

WALTER MEHEULA HEEN currently serves as a Trustee for the Office of Hawaiian Affairs and as president of Na 'A'ahuhiwa (Association of Retired Hawaiian Judges) following an illustrious career that includes judicial offices in the State District Court (Honolulu), State First Circuit Court, United States District Court, and State Intermediate Court of Appeals. He has also served in private law practice and as Honolulu Deputy County Attorney, United States Attorney, Territorial and State Representative, State Senator, and Chair of the Honolulu City Council. He is past president of the Honolulu Hawaiian Civic Club and a founding Board of Directors member of Big Brothers of Hawaii.

PHOTO CREDIT

All photos courtesy of Western Pacific Regional Fishery Management Council

LESSONS: FISHING IN OLD HAWAI‘I

BACKGROUND

The lessons below were informed by the Ho‘ohanohano I Nā Kūpuna Puwalu. They and other Fishing in Old Hawai‘i lessons are available as video at www.wpcouncil.org/education. These segments originally aired in Hawai‘i on *Let’s Go Fishing* and are sponsored by the Western Pacific Regional Fishery Management Council.

HARMONY

In old Hawai‘i, the Hawaiians focused their entire life on the ‘āina (land), ke kai moana nui (ocean), and akua (god). They learned to live in harmony with those three entities. They respected the land, and the land fed them. They respected the ocean, and the ocean fed them. They respected ke akua mana (knowledge of god), and ke akua fed them. They prayed with each movement they made. The people were educated to have the proper respect when they went into the water. They were taught to not make shi-shi (urinate) in the kahakai (shoreline) or on the papa (reef). Human waste dissolves the wana (sea urchin). It dissolves the limu (seaweed). It is a poison. When you go holoholo (on an outing) to gather, mālama (care for) the ‘āina, mālama the kahakai, and mālama ke akua.



The honu (Hawaiian green sea turtle) was important to Hawaiians for subsistence purposes and for its spiritual and cultural association with the Hawaiian god Kanaloa.

LEARNING

One of the first things that children were taught was a strict code of conduct. How did they learn the code of conduct for fishing? They were disciplined to hāmau (keep silent). When they accompanied their parents at the kahakai (shore), they stayed in one place quietly and paid attention. They were not to ask questions. So their eyes and their ears were very important. If they didn’t pay attention, they didn’t learn. Children were also

taught to not move the stones inside the water. When the rocks are moved, the he‘e (octopus) and fish have no house to come back to. After observing for a while, when the makua (adult) or kupuna (elder) decided that they were ready, the children would be invited to demonstrate their skills. They would begin their experience as a fisherman by being a bag boy or girl.



Henry Chang-Wo teaches children about limu (seaweed). Traditionally, children in Hawai‘i were taught to learn with their eyes and their ears and not to ask questions.

MOKU

In old Hawai‘i, the islands were divided into districts known as moku. Each moku had its own policymakers. They became experts in understanding the fishing management needs of that specific area of that specific island. Their decisions included an awareness of the clouds, the forest, the streams, the fishponds, the ocean, and consideration of its own residents. Preserving moku management today is challenging. But it is worth the reward. Our resource for seafood will be protected.

AHUPUA‘A

In old Hawai‘i, fish harvesting seasons differed from one part of the island to the next. What worked for one area did not necessarily work for another. “One size” of policymaking did not fit all. Each micro-climate, or each ahupua‘a, relied on generations of local ocean experience and knowledge. To protect their food that came from the sea, Hawaiians of old took no chances. We have much to learn from these traditional practices. But it is worth the reward. Our resource for seafood will be protected.

MELE AND OLI

Each island, each moku, each ahupua‘a, each family had its own practices and protocol to go fishing. They also had their own

pule (prayers), oli (chants), and mele (songs) that referenced these practices and were taught to the children. We can still do that today within our own families. We can still continue to haku (compose) those mele. They don't have to be traditional mele that were passed down. If someone in your 'ohana (family) has the ability to perpetuate knowledge through mele and oli, write it down, teach it to the family. Teach it to the next generation.



Kelilipoo Mawae is a lawai'a (traditional Hawaiian fisherman) and musician from Kaluakoi, Moloka'i.

KAHAKAI

In old Hawai'i, ocean and shoreline management was the kuleana (responsibility) of those people who lived in the immediate area. The ko'a (places where fish gathered) were monitored and kept clean under the supervision of the resident konohiki (manager). Today our ocean areas are the property of the public and the responsibility of the government. The ko'a have become degraded. Perhaps there is a better way to malama (care for) our ocean resources. Perhaps the old ways were the wisest.

PO'OLO'ULO'U

Po'olo'ulo'u is a word from Moloka'i. You will not find that word in any dictionary or newspaper. It is a word that means turbulent, and it references Moloka'i's wealth. When the Makali'i (constellation Pleiades) would come up, the fish would move from the west end towards central Moloka'i and on to the east. The ocean would be turbulent near shore, but outside it would be mālie (calm) like glass. Po'olo'ulo'u, this turbulence, is a term that references Moloka'i's wealth because those moving fish restocked the fishponds. If you have kūpuna who fish, listen to them. They have words and mana'o (thoughts) found only within the family, which you may never hear again.

HONU

In old Hawai'i, honu (green sea turtles) meant more than just food to the Native Hawaiians. The honu was important to traditional Hawaiian practices not only for its subsistence purposes, but also for its spiritual and cultural association with the Hawaiian god Kanaloa. Many kūpuna today believe it is time to reintegrate and sustain the importance of the turtle within the Hawaiian culture.

MORE RESOURCES:

Fishing in Old Hawai'i:

<http://www.wpcouncil.org/education>

Let's Go Fishing:

<http://www.benwongtv.com>

Traditional Lunar Calendars:

<http://www.wpcouncil.org/education>

PHOTO CREDIT

All Photos Courtesy of the Western Pacific Regional Fishery Management Council

OCEANIA



**Look to the source,
Look to the sea.**

NMEA members in the Pacific Islands may join OCEANIA simply by completing the registration form at www.hawaii.edu/mcc/oceania/. Others may join by completing the form and submitting a small fee.

OCEANIA is a dynamic organization bringing together those interested in the study and stewardship of the world of water—both salt and fresh.

OCEANIA is the Marine Science Section of the Hawai'i Science Teachers Association and the Pacific Islands regional chapter of the National Marine Educators Association (NMEA)

OCEANIA provides a valuable focus for marine and aquatic studies and includes professionals in science, business, government, museums, aquariums, marine research, and education.

INTERNATIONAL PACIFIC MARINE EDUCATORS CONFERENCE

BY SYLVIA SPALDING

PRESSURES FROM A RAPIDLY GROWING WORLD POPULATION *are changing oceans at an unprecedented rate. From CO₂ concentrations that accelerate global climate change to depletion of fishery stocks, the problems are unprecedented and will require innovative solutions. A worldwide network of educators to focus on these efforts is essential. The International Pacific Marine Educators Conference (IPMEC) was a landmark meeting that culminated in the emergence of such a network of marine educators focused on the Pacific Ocean and the communities who depend on it.*



Approximately 100 participants from 18 countries and territories participated in the International Pacific Marine Educators Conference in person or by web conference.

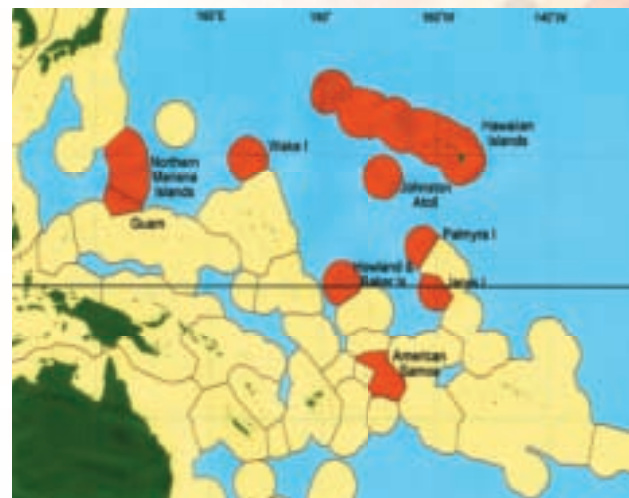
From an historical perspective, one could trace the beginnings of IPMEC to 1990 when John Tomkin, president of the Marine Education Society of Australasia (MESA), led a group of 23 Australian marine educators on a four-week tour of marine education facilities on the West Coast of the United States. The tour resulted in a number of long-time associations between members of MESA and the National Marine Educators Association (NMEA) in North America. Many subsequent cross-cultural visits exposed the challenges in both knowledge and resource sharing on the international scene.

During one such visit, a small group of MESA and NMEA members meeting at the NMEA 2000 conference in Long Beach, California, formed a plan to hold an international meeting of marine educators in conjunction with the scheduled NMEA 2005 conference in Hawaii. Thanks to the contributions of Mike Spranger, Vicki Osis, and Frannie Coopersmith in the USA and Jody Plecas, Mark Rodrigue, and Harry Breidahl in Australia, this first international meeting, the One Ocean Marine Forum (OOMF), brought together 27 marine educators from seven

nations (USA, Australia, New Zealand, Japan, Canada, England, and South Africa) for two days at the Maui Community College in July 2005.

With Lisa Heft as facilitator, OOMF formed six action groups. One of these groups, proposed by Kitty Simonds and chaired by Sylvia Spalding of the Western Pacific Regional Fishery Management Council, was dedicated to planning and facilitating an international meeting of marine educators focused on the Pacific Ocean and the communities who depend on it. IPMEC, as it came to be known, was seen as a logical step in the process of uniting marine educators globally. It was envisioned that the conference would result in the creation of a Pacific network of marine educators that could serve as a model for the creation of other regional networks of marine educators and that eventually these various networks might link together to form a global network.

Joining Kitty and Sylvia on the IPMEC organizing committee were Harry and Jody in Australia; Vicki Osis, Mellie Lewis, Richard Murphy, Sarah Schoedinger, and Peter Tuddenham in



The U.S. exclusive economic zone (EEZ) in the Pacific islands (in red) comprises about one-half of the U.S. EEZ.

the continental USA; Barb Klemm, Mellie Lewis, Barbara Mayer, and Sherwood Maynard in Hawaii; and Hugh Govan and Joeli Veitayaki in Fiji. Sponsorship was provided by the Western Pacific Regional Fishery Management Council (platinum), the NOAA Office of Ocean Exploration and National Marine Sanctuary Foundation (gold), and The Ocean Foundation and the National Marine Educators Association (silver).

The conference was initially scheduled to be co-hosted by the Western Pacific Regional Fishery Management Council and the University of the South Pacific and to be held January 15-19, 2007, in Fiji. More than 100 participants from 20 countries submitted abstracts and registrations for the conference. Then in 2006, political unrest in Fiji began to mount. The organizing committee remained hopeful that the political situation would settle, but on December 4, 2006, it agreed that the conference should be relocated. The next day, a political coup in Fiji confirmed that the committee had made the right decision.

Thanks to the hard work and dedication of the staff of the Western Pacific Regional Fishery Management Council, the conference venue, hotel, and field trips were shifted to Honolulu in record time. The conference start date remained January 15, 2007, but logistics required that the conference end a day early, on January 18th. Therefore, anticipated activities to involve communities and sharing resources with them were canceled. The U.S. Department of State helped to expedite visas for foreign travelers. While some participants had to drop out due to the change in venue, other participants joined in. The conference size remained stable at approximately 100 individuals participating in person and by web-conference, but the representation of countries and territories dropped slightly to 18.

Through the technical expertise of the College of Exploration, six of the conference's 70 oral presentations were delivered in real-time via the web from areas spanning the East Coast of the United States to Papua New Guinea, including the U.S. Midwest,



Breakout sessions featured K-12 initiatives, higher education initiatives, community programs, traditional knowledge, sea turtles, tourism, and web conferencing.



Six oral presentations were delivered via the web from locations spanning the U.S. East Coast to Papua New Guinea.

Mexico, the island of Kauai, and Australia. Moreover, groups from Australia, Hawaii, Mexico, New Caledonia, Papua New Guinea, and the continental United States were able to participate in the conference via the web. They had the option of viewing presentations and engaging in the question-and-answer periods real-time or at their leisure. After the close of IPMEC, the College of Exploration generously made the entire conference available online to anyone at www.coexploration.org/ipmec.

The goals of IPMEC built upon the aims of OOMF as follows:

- Through education, to contribute to a cultural shift towards sustainable use of ocean resources across the Pacific Basin.
- To change our behaviors as educators so we can share our resources and build up the capacity of those educators who don't have those resources both within our own countries and within those countries that lack resources.
- To facilitate the development of Pacific Basin regional marine education leadership networks that will share information, ideas and resources, and reduce duplication.
- To initiate the development of a Pacific Basin marine education networking strategy.
- Focus geographically on the Pacific as a model for other regions to follow and eventually to link up globally.



Facilitated workshops led to the establishment of the International Pacific Marine Educators Network (IPMEN).

By all accounts, the conference was a success. A committee was formed to establish the International Pacific Marine Educators Network (IPMEN) with Ben Mikaere Namakin (Federated States of Micronesia) as chair. Other members include Leimana DaMate, Jarad Makaiau, and Jennifer Metz (Hawaii); Jasmine Mason (Canada); Luis Pinto (Chile); Craig Strang and Peter Tuddenham (continental USA); Teny Topalian (Northern Mariana Islands); Nacaniele "Nat" Tuivavalaqi (Marshall Islands); Andrew Vance (Australia); and Ron Vave and Semisi Meo (Fiji). Sylvia Spalding and Harry Breidahl serve as ex officio members.

The IPMEC participants agreed to hold biannual conferences. The 2008 conference is scheduled to be held in Townsville, Australia, October 16-21, in conjunction with the second International Youth Coastal Conference (IYCC). The development of the first IYCC in Queenscliff, Australia, in 2006, was the focus of another OOMF action group, which was led by Andrew Vance who chairs the IPMEN 2008 conference. The 2010 IPMEN conference is scheduled to be hosted by the University of the South Pacific in Fiji, while Chile is looking to host the 2012 conference on Easter Island.

At the 2008 IPMEN conference, the network envisions furthering other goals identified at IPMEC:

- Create a website to include a database inventory of resources, events calendar, etc.
- Develop points of contact for each country and territory in the Pacific.
- Create a list serve of marine educators in the Pacific.
- Train tour operators in the Pacific.
- Develop ocean literacy "principles" for the Pacific.
- Connect IPMEN to other existing networks in the Pacific.
- Build capacity and infrastructure of marine educators in the Pacific.



During the 2006 National Marine Educators Association annual conference, next steps to advance IPMEN were discussed.

To learn about IPMEN and to join this network of educators with a passion for the Pacific Ocean and the communities who depend upon it, please visit www.ipmen.net.

MORE RESOURCES:

College of Exploration:

<http://www.coexploration.org/ipmec>

International Pacific Marine Educators Network:

<http://www.ipmen.net>

One Ocean Marine Forum:

<http://www.mesa.edu.au/inter/oomf01.asp>

SYLVIA SPALDING is the communications officer for the Western Pacific Regional Fishery Council and was the chair of the International Pacific Marine Educators Conference.

PHOTO CREDITS

Page 25 (right): Courtesy of Harry Breidahl

All other photos courtesy of the Western Pacific Regional Fishery Management Council

OCEANREVOLUTION.ORG: EVOLVING THE OCEAN CONSERVATION MOVEMENT IPMEC: KEYNOTE ADDRESS (DAY 1)

BY WALLACE J. NICHOLS

THERE HAVE BEEN MANY KINDS OF REVOLUTIONS throughout our history. What we need now is an ocean revolution. We need to change our relationship to the ocean—not a little incremental change, not small adjustments here and there around the edges, but some fundamental rethinking about what it is that we're doing to the ocean, and how it is that we benefit and live from the ocean. We need a positive, peaceful, nonviolent revolution, so when our children grow up they will be able to eat healthy, abundant seafood and have the choices that we have or that we've had in the past.

We are on, arguably, Planet Ocean, rather than Planet Earth. The majority of our planet is covered by the ocean. The majority of the biodiversity of the planet is in the ocean. The majority of habitat is beneath the ocean. Yet, we do not know as much as we should about the ocean and we certainly don't treat it as well as we could. So we really need to be thinking about creating an ocean revolution.

With that in mind, we started Ocean Revolution. It is a movement with a website focused on getting the word out to young people, networking to get them together and helping them become stewards of the ocean in their own way. We're also trying to reach kids who may have science phobia or math phobia, but still love the ocean and still want to figure out how to plug into the ocean conservation movement.



TOO MUCH OUT, TOO MUCH IN, DESTROYING THE EDGE

It's pretty clear that the ocean is in trouble. Over the past few years, two multi-hundred page reports have come out piled with facts and recommendations about the ocean. These facts won't make sense unless we have some kind of framework, some sort of basic understanding or worldview that will allow them to stick.

The framing of this ocean crisis can be boiled down to three essential things:

- We've taken too much out of the ocean.
- We've put too much into the ocean.
- And we're destroying the edge—the coastal wilderness at the edge of the ocean, the coastal waters, convergence zones, and other edgy places out in the open ocean where life accumulates and the animals that we like to eat and think about hang out.

So the call to action, based on those three essential points, which all ocean issues fit into, is:

- We need to put *less in* the ocean.
- We need to take *less out* of the ocean (and what we do take out needs to be taken out in a smarter way).
- And we need to *protect the edge*.

The take home message is "less in, less out, protect the edge."

LESS IN

The first part is we've put too much into the ocean. There's industrial ocean pollution, the point source runoff, and the domestic stuff that runs off of our streets and down our waterways during rainstorms. We know very well that this pollution in the ocean kills animals and is also bad for our health.

There's an increasing awareness of the non-point problem thanks to the popularity of stenciled messages. Surfrider and other organizations stencil these messages next to the drains so that people will not throw their garbage or throw their waste into drains. The message reminds the public that what goes into the drain goes downstream and eventually ends up in the ocean.

There are other simple solutions. For example, after a storm event, an inflatable boom can be used to contain floating plastic that comes down the waterway. The plastic can then be removed and recycled or taken to the landfill. We know that there's an awful lot of plastic out there floating around in the ocean and it's not going away. It may photo-degrade, it may break down, but even when it breaks down, small little pieces remain in the water, and they're finding their way back to us up the food chain.



Simple solutions exist. After a storm event, an inflatable boom can be used to contain floating plastic that comes down the waterway.

Animals like sea turtles interact with this garbage. They evolved in a world without plastic. When they see plastic in the ocean, they think food. They think jellyfish. They think algae. They eat it, and some of them die of that. Animals, including humans, are ingesting this plastic that goes into the ocean. It's such a huge issue, we really need to tackle it, and the solutions are not completely clear. The ratio in some parts of the Pacific Ocean of plankton to small pieces of plastic is 1-to-5, meaning filter feeders are getting more plastic than plankton as "food" out of the water, and that stuff does come back up the food chain.

For those of you who like to be in the ocean to dive, to swim, to kayak, to surf, or to snorkel, the idea of not being able to go into the ocean is like torture. It is really depressing to travel to the edge of the ocean only to find a sign between you and the water telling you not to swim. It should be our basic right to have an ocean that is clean enough that we can wade or swim or surf in it without getting an infection. But increasingly, along our coast, we find beach closures and no swimming advisories.

The health of the ocean, the health of the animals in it, and our health are all intimately connected. What happens to the ocean is going to affect us. Contamination, toxins in the water, will come back to us.

We've launched a project in Mexico that basically is an attempt to connect human health, ocean wildlife health, and ocean

health. This was spawned through a study we were undertaking on the health of sea turtles in Baja. We found that the turtles had levels of heavy metals, cadmium in particular. Consumption of those turtles may be harmful to the health of people, particularly children and pregnant women. We decided to pursue the opportunity to get this message out through a project that addresses the connection between human, ocean, and wildlife health.

Two other big components with regard to the "too much in" point are heat and sound. We're warming the globe, and we're warming the oceans. This is leading to increases in the sea level. But a sea level rise of a few centimeters is a problem. Warming the ocean also changes its chemistry, its currents, and the movement and the distribution of animals in the ocean. It changes the food chain, and it changes the volume of the ocean.

Sound in the ocean is also a problem. We're creating a lot of noise in the ocean, and the effects of that noise on the animals that live in the ocean are understudied.

LESS OUT

Regarding the second part—"too much out" of the ocean—the two main components are overfishing and bycatch. This applies not only to big industrial fleets that do not touch ground over the course of the year, but also to medium-size vessels and small artisanal vessels or skiffs. Most of the world's fishermen are small-scale, artisanal fishermen. These small-scale fishers access places along the coast where large animals and megavertebrates hang out. This is an important point to bring up. We're not just talking about industrial fishing, large-scale commercial fishing. We're talking about all of the fishers of the world.

The first component, overfishing, is related to over-consumption of animals. Poaching and use of sea turtle eggs and their meat have led many populations of sea turtles to the edge of extinction. This was also the case with whales before sea turtles, and we're seeing it increasingly with sharks around the world, both



Most of the world's fishermen are small-scale, artisanal fishermen. Up to 35,000 sea turtles are killed annually in northwestern Mexico.



Turtle egg sale in Mexico. ©T. Garland

for their meat and for their skin. Many of these large, attractive animals or charismatic mega-fauna are declining because we're taking too many of them out. As Elliot Norse says, "People are eating these animals into oblivion."

The second component of the too much out is that we catch some animals en route to the ones that we want to catch to eat. This is called bycatch or bykill, the animals that get in the way as we're trying to fish—animals like albatross, marine mammals, sea lions, whales, dolphins, and sea turtles. Fishermen are not trying to catch sea turtles. They're not trying to catch marine mammals. But in the practice of fishing, whether it's using nets or hooks, turtles and whales and birds get caught.

For example, some small-scale fishermen based in coastal communities in Baja California have a very high impact on animals like loggerhead sea turtles, which have their hot spots along this coast. The impact of these small-scale fishermen, even though there aren't many of them and they don't have many nets, is surprising. Because they fish for halibut in this loggerhead hot spot, the scale of their impact rivals the impact of the entire longline fleet in the North Pacific. This is an interesting, but important point as far as our looking at bycatch.

Some animals are able to survive interactions with fishing gear. Some sea turtles are able to exist fine with hooks in them and are still able to beach to lay eggs. Other animals are not so lucky. They may be released with the hooks in their throats and then die a slow death.

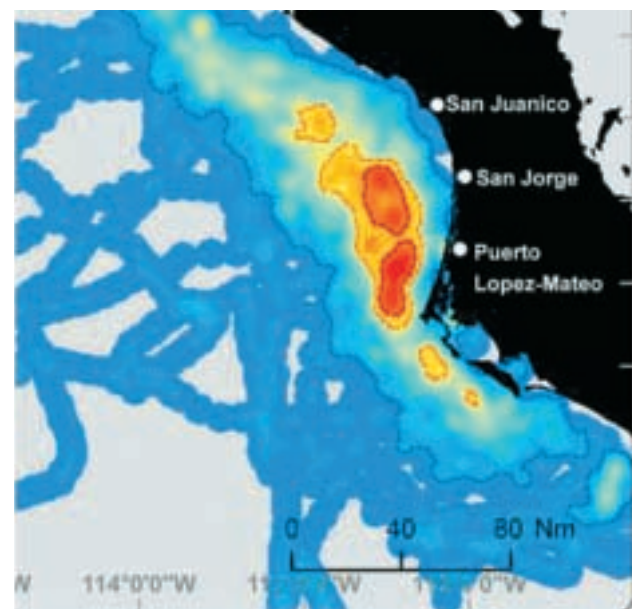
There are solutions to some of these problems. But the best practices of some fishermen, such as those implemented by some longline fleets, need to be shared and be implemented all over the world.

The same is true with shrimp trawling. Turtles and other animals get caught up in shrimp trawls and are basically just wasted and thrown over the side. Yet, we have technology available to reduce the amount of bycatch in shrimp trawls. They are called turtle excluder devices or trawl efficiency devices.

PROTECT THE EDGE

The third part of the call to action is that we're destroying the edge. We love to live near the ocean. We build our towns, our cities, our homes, and our roads along the ocean. Sixty percent of the world's population is within 100 kilometers of the ocean and are considered coastal.

There are very few places left where the coast is truly wild. Coastal wilderness where animals are on their own terms, or where we enter the wilderness and we're on their terms, is becoming increasingly rare. However, some wildlife—like bears and other large mammals—need space. They need to be away from us in order to survive. Some animals need to be able to go from the land to the coastal waters. Whether it's a deer licking



Because artisanal fishermen in Baja California operate in a loggerhead hot spot, their impact on the species rivals that of the entire longline fleet in the North Pacific.

the salt off of algae or bears foraging on fish that are washing up on the beach, the connection between the land and sea is really important. But the connection between the land and the sea is being shattered. Coastal highways, which get us to the places we love to go and are beautifully scenic, go through lots of open space. Large terrestrial mammals that want to go to the beach can't. For example, in the Santa Cruz Mountains, grizzly bears used to predate elephant seals. That hasn't happen for 100 years.

Then there are our wetlands and coastal estuaries. They are extremely important in terms of productivity, diversity, and nursery habitat for the animals that live in the rest of the ocean. They are incredibly important areas with regard to maintaining healthy fisheries.

Other important areas that occur on the edges of land are coral reefs and upwelling. Everybody is familiar with the upwelling that occurs on continental margins and on the edge of the land. However, some upwelling also occurs at convergence areas in the middle of the Pacific Ocean that are extremely important for fishing and for animals like tuna. We need to protect those areas to make sure they're healthy and productive so that the biological processes in these places remain intact, and we can continue to extract the protein that we need to live on.

People want to live near the ocean. The demand for coastal real estate is partly driving the development of the coast, and that's now spilling over into places like Baja California, where real estate is less expensive, but becoming very expensive.

NETWORKS, KNOWLEDGE, AND COMMUNICATION FOR OCEAN CONSERVATION

So what do we do to address this bad news? Where do we find the hope to address the ocean crisis that has occurred as a result of our having taken too much out, put too much in, and having wrecked the edge? The call to action is that we need to take less out, put less in, and protect the edge. We need a paradigm shift.

We're entering into a very interesting, problem-solving phase with regard to our relationship with the ocean. This is how it breaks down in three parts.

First, we've got new *knowledge* and some of that is due to technological innovation and inter-disciplinary research. People are working cross-disciplines now in a way that they weren't doing quite as well or quite as often in the past.

Second, we now have collaborative *networks*. A jellyfish expert in one part of the world can work with a jellyfish expert on the other side of the world on a daily basis from the comfort of his or her office.

And, third, we've come to understand social marketing, neural biology, sociology, and psychology in ways that are revolutionizing

communication, the way that we explain things, the way we educate, and the way we try to create social change.

These three things combined, used together, can create the kind of change that we're talking about. These three components—new knowledge, building networks, and communicating—are leading us to practical solutions, new markets and policies, and social change so we have a healthier relationship with the ocean and a more well-developed sea ethic. We can connect people to the ocean through specific things that get them excited, like sea turtles, their waterfront, marine pollution, or maybe marine mammals, whales, and dolphins. Then we use that connection to build a broader sea ethic and then a broader environmental ethic. So there's an entry point oftentimes—which can be a species or a particular issue—that can then be broadened out to a wider environmental ethic.

We need to get involved. That's the network part. We need to solve. We need to build the knowledge and find solutions. Then we need to evolve, and that's the communication and social change, social marketing part. So this is basically a simple framing of the ocean revolution.

To get people involved, we want to build the networks. Networks are decentralized. They're resilient, and they are diverse. That's why networks are important. The Internet is probably the analogy or the metaphor that people are most familiar with. If the Internet goes out here in one geographical location, the Internet, itself, still stands. It's diverse and it's resilient. Essentially what we're talking about is collaboration and the relationships between people. The important thing about a network is that it reminds us that we're not alone, that we're part of something bigger than ourselves, bigger than our organizations.

We want to get new people involved. We want to get volunteers hooked into the ocean conservation movement. Sometimes that's through day-long events, afternoon events, sometimes long, two-week vacations where they can participate.

With Ocean Revolution, we do youth retreats. We find young people who are young ocean leaders. We get them together. We visit an exciting place, like Baja California, the Northern California Coast, Mozambique or the Caribbean, and we help them to find their voice, find the solutions, and communicate those.

We encourage young people to get involved by doing three things. First, they join Ocean Revolution. They just create a little profile to connect up with each other. Then they join a local ocean group, as well as a national or international ocean group.

The second part of this conservation mosaic is the solve part, the solution, and the new knowledge. We've got a lot of new ocean knowledge. Technology is exploding. Thousands of animals have transmitters on them and data is constantly streaming in real-time. We're able to use powerful computing tools that didn't use to be available to us and overlay that information with oceanographic information, fishing effort, and human demographics.

A very simple effort is to look at longlining and sea turtle abundance and then help longline fishermen avoid the places where sea turtles spend the most time.

To serve humanity, this technology needs to be informed by social sciences. It needs to be decentralized, and that's happening. That's what Wikinomics and Wikipedia are all about. That's what the web is allowing us to do. With YouTube, you can share your home videos or anything you happen to have in video with the world through the Internet. So decentralizing these technologies in these two tools is really important.

Finding the solutions, solutions like cleaning up garbage, cleaning up the coast, recycling and using less plastic, consuming sustainable seafood, and making seafood choices that are smart. Solutions like using circle hooks rather than J-hooks, and experimenting on new kinds of hooks. Solutions like eating seafood that's certified by groups like the Marine Stewardship Council.

Another solution, protect the remaining coastal wilderness. There's very little left, and we have the need to create some marine protected areas where fish are spawning, where the high biodiversity spots are, and create protected areas where the wilderness is still intact.

The third part is sharing, the communicating component. It's social marketing. The goal is to get individuals to change their behavior and to create public change, to create policy change. So we get the governments to change and move in the right direction, we get individuals to act in the right way. Film-making technology is now available to everyone. You can produce your own film on your own laptop in the field, come back from the field, and share it with the community that you work with. Some people paint themselves blue to express their interest in ocean conservation. Some people wear an ocean revolution wristband that allows them to communicate their interest in ocean conservation. For example, kids who are involved in Ocean Revolution have spoken to the U.S. National Press Club, giving them opportunities to voice their opinions publicly and to share with adults how they feel about the ocean. Girl Scouts on the East Coast have earned their Ocean Revolution patches by doing something in the involved category, something in the solve category, something in the evolve category, and they're proudly wearing their patches at their jamboree.

We're really in the midst of a fundamental shift, a paradigm shift, with regard to the ocean and how we relate to it. The ocean crisis is a social dilemma. We know social change is possible. There

are some revolutions that humanity accomplishes without quite knowing how because it's everybody who takes them in hand. That's where we need to go. The ocean conservation movement in the past has felt like a lot of people doing good work, kind of going in different directions, but doing good things in different places. Now, we're starting to pull together, coalesce, network with each other, and share what we're accomplishing and share the tools. That is coming together in meetings like this International Pacific Marine Educators Conference where we can collaborate, we can learn, and we can go back and do what we do well.

Remember: less IN, less OUT, protect the EDGE. Get involved, find the solutions, share those solutions, and evolve yourself



Wallace J. Nichols (author) with a turtle.

and your community. Viva la Ocean Revolution.

WALLACE J. NICHOLS, Ph.D., is co-founder of Grupo Tortuguero and WiLDCOAST; conservation science director at Pro Peninsula; research associate at the California Academy of Sciences; founder of Ocean Revolution; and co-author of *Chelonia: Return of the Sea Turtle*.

PHOTO CREDIT

All photos courtesy of Wallace J. Nichols

CLIMATE CHANGE EFFECTS ON OUR NATURAL RESOURCES AND RIGHTS IN THE PACIFIC IPMEC: KEYNOTE ADDRESS (DAY 1)

BY BEN NAMAKIN

THOUSANDS OF PEOPLE IN THE PACIFIC ISLANDS *live in remote areas and don't work in the office. We exist on this planet because of our natural resources. We contribute less than one percent of the world's greenhouse gas emissions. We are not the cause of climate change. But we are the most vulnerable to its effects. It is destroying our natural resources and denying us our human rights. That's why it's very important for us to speak up and make other countries aware of the price that we are paying for their environmental risk-taking.*

Today we commonly see flooding and droughts because of the change of weather patterns. Saltwater intrusion is affecting the quality of our drinking water, as well as the water of our taro patches and our agricultural products. Our very beautiful, unique terrestrial and marine species that make us proud every day are under threat because of coral bleaching and other effects of climate change. These effects are happening more frequently and intensely these days, which is evidence that global warming is really happening. The effect is worse in the atolls. In Kiribati, the people are confused by the changes they are seeing with the environment because they've never experienced these things in the past.

This is not just an environmental problem. It's a human rights issue as well. The Universal Declaration of Human Rights speaks to economic, social, and cultural rights. If we look at the economic rights, that means we have the right to make money. But global warming is destroying the ecotourism, agriculture, and fisheries that dominate our Pacific economies. If we look at

social rights, many of our social affairs that take place on beautiful areas like beaches; how can we continue to do these things if our beaches are eroded? As far as cultural rights, consider the people in Kiribati who use rocks in the sea as landmarks to navigate their way out into the ocean to fish. Now these rocks are completely underwater, and so some parts of their culture have been destroyed also. The pandanus trees mean a lot to the people of Kiribati, as it is used for making houses, traditional dancing clothes, thatches, local medicine, and more, many of the pandanus trees are being destroyed by saltwater intrusion. The same situation is also being experienced in other parts of the Pacific Island nations.

Our small island nations will be covered one day if nothing is done to deal with sea level rise. Where will we all go? If we're going to be offered a place somewhere else to move, who is going to pay for the costs and how will we carry on our cultural identities? How can we carry those fish that we love to eat in the Pacific Islands with us, how can we carry the plants



Saltwater intrusion in Kiribati (2003).



Coral bleaching in Pohnpei, Federated States of Micronesia.

that provide us with local medicine? This is going to be impossible. Our civil rights, our right to live is being taken from us by global warming.

We're doing our best to protect our resources and our limited land space because we depend on them for our living. But we've got limited financial and human resources. We really cannot afford to fight global warming. Therefore, we must not be afraid to speak up on this.

It's important for us to teach our students in the classroom about their local environmental issues, so that they can step out and do something about the environment and raise awareness in their communities. But it's also very important to extend the learning to the outside world—to write letters and send them off to other parts in the world. To push students to push the local leaders to keep lobbying the most industrialized nations. Students cannot travel much. But our leaders travel on our behalf to international meetings. So it's very important that our students do something to convince local leaders to push the most industrialized nations to do something about this issue.

We also need to push for serious environmental issues to be prioritized in the educational curriculum. In Pohnpei, the Department of Education is offering good science programs. But most of the textbooks come from the outside world; and today, the Education Department is very concerned about environmental issues and working closely with the Conservation Society of Pohnpei to develop an environmental resource and activity book for the kids to learn in the classroom how to become more responsible for their surroundings. Throughout the world people have been focusing on serious issues like HIV. They have to be prioritized in the curriculum so that the students can learn about them and know how to deal with them. That is what has to be done about the very serious environmental issues in the Pacific Islands today. Kids should be pushed to start learning from first grade about environmental conservation issues, global warming, and more, and then continue being taught about these issues while they're growing. Then when they go to high school and college, they already know what to do, and they can continue to go out and raise awareness in their communities as well.

Also, we have to be role models. If our Pacific Island leaders are shouting at the most industrialized nations during international meetings on climate change, it's very important for us to show the world that we're doing something about it like energy conservation, curriculum developed on climate change, and more. Many of these have been done in the Pacific, but we need to always build on what we have to keep improving our education programs. We need to get our leaders to pass clean energy bills and policies and otherwise support environmental conservation locally, so when we ask for help from the people out there, they will realize that we, Pacific Islanders, are really concerned about the problem and we're trying to do something about it as well.

Climate change is a global issue, so it needs a global solution. It is not enough to raise awareness in the Pacific Islands. We need to tell others that we need their help. For example, the work we are doing on marine protected areas, watersheds, forest reserves, and other conservation areas will be weakened if the other side of the world continues to put greenhouse gas emissions and carbon dioxide in the atmosphere. That's why it's very important to extend our awareness.

When I started writing letters and doing research on climate change impacts in the Pacific, I found myself to be the only Pacific Islander among the 30 international youths who were brought together to represent the voice of the world's youth at the Eleventh Conference of the Parties and First Meeting of the Parties to the Kyoto Protocol (COP11/MOP1), United Nations Framework Convention on Climate Change (UNFCCC) meeting in Montreal, Canada, in 2005. The others were from Asia, North and South America, Europe, and Africa. It was frustrating being the only person from the Pacific Islands, and it was very tough for me to speak on behalf of the Pacific when we were trying to put in our concern in the declaration that we were forming. But finally, I did and they accepted what I was trying to say about the impacts of global warming in our Pacific Island nations. I was also selected to address the 10,000 delegates on behalf of the World's Youth and the future generation of this planet.

While in Canada, we tried to lobby different governments on the issue. One of my targets was Australia, because it is a proud member of the Pacific Islands Forum, but it has not ratified the Kyoto Protocol. I met up with Australia's Minister of Environment, Honorable Senator Ian Campbell and asked him what Australia could do to help us out on this issue.

Then in 2006, a group in the United States brought me there to work as a team with them to find a way for the United States and the Pacific Islands to work together to solve the climate change problem. I was challenged with a speaking tour across that country. I spoke about what is happening to our environment, what the community members in the villages are experiencing, and how our human rights are being abused. I was trying to influence U.S. citizens to vote for leaders of their respective states and country who would help us in the Pacific Islands by ratifying the Kyoto Protocol.

While in the United States, I also tried to chase down Congressional and Presidential candidates, especially the ones who received most of the oil contributions, to encourage them to ratify the Kyoto Protocol, if they happen to become the leaders of the country.

Then I tried to get a number of students to help do something to slow down the heat. A number of students signed up to help. Most importantly, lots of students came to realize that there are actually islands in the Pacific Ocean and that we are facing problems because of global warming.



Pacific Island Monthly, April-May 1989 issue.



Impacts of sea level rise are forcing indigenous communities from small island nations to relocate.

There are a number of students involved in the movements going on in the United States to fight global warming, but they are waiting for the national government to create a serious policy on clean energy. The students are very concerned not only for the Pacific Island people but also for future generations in the United States because they too will be severely impacted by climate change. For example, almost all of the scientists agree that the intensity of hurricane Katrina was caused by climate change.

It was not easy to get up and speak. I put myself at risk. But I tried to be brave, because I know that I have the right to speak up. I must not be afraid to get up and speak in front of these big nations, because I don't want to lose my islands. I don't want to lose my Pacific.

In 1989, when I was in the third grade, the April-May cover of the *Pacific Islands Monthly* magazine read: "The greenhouse effects, say goodbye to Kiribati, the Marshall Islands, Tokelau, Tuvalu, the Great Barrier Reef." The word goodbye was said to my homeland in Kiribati and to other low-lying Pacific Islands. At that time, I did not know anything about this, but it makes me realize that this has been discussed for so many years, but the impacts are getting worse. What has been done? Why are these things getting worse?

Some of our fellow Pacific Islanders have already relocated. For example, many people moved from Tuvalu to New Zealand because of sea level rising. Where would the rest of us go? Have you really thought of how serious this issue is to us?

If we care so much for the future generation, let's speak up. We're going to lose our natural heritage unless we keep pushing the most industrialized nations to come up with a solution, to come up with an option for us. If the leaders in our community and our government are not acting on this or they're not worried too much about it, then will cut them out. We're not going to wait. We can be the leaders today.

BEN NAMAKIN is an environmental educator with the Conservation Society of Pohnpei (CSP), Federated States of Micronesia.

PHOTO CREDIT

All photos courtesy of Ben Namakin

WHAT MARINE EDUCATION DOES THE SOUTH PACIFIC REALLY NEED? IPMEC: KEYNOTE ADDRESS (DAY 2)

BY HUGH GOVAN ET AL.

"WHAT MARINE EDUCATION DOES THE SOUTH PACIFIC REALLY NEED?" may be a controversial title for someone who could be considered an "outsider." However, national coordinators and I have attempted to provide depth to this topic by taking experiences from two regional programs that have operated for more than five years in the South Pacific. The Foundation of the South Pacific International (FSPI) Community and Coast Program is a network of non-government organizations (NGOs) in Vanuatu, Tuvalu, Kiribati, Fiji, and the Solomon Islands. The Locally Managed Marine Area (LMMA) Network is an Asia Pacific network that operates in Fiji and has members in Papua New Guinea, Palau, Pohnpei, Indonesia, Philippines, and Solomon Islands; network beginnings in Vanuatu; and interest from Samoa, Marshall Islands, and so on. These two networks have focused most of their resources on capacity building for resource management and conservation.

When looking at marine education needs in the South Pacific, it is vital to first reflect upon the general context that managers of marine resources face in the region.

- In the order of 80 percent of the populations live in rural areas and remote islands and villages. They're far away from markets and from services that governments usually supply. They have relatively weak "voices" that are not heard at the national or international level. They're not involved in consultation processes. Self-reliance is often the mode of existence.
- The populations rely heavily on fish. Many of the countries consume more than 50 kilograms of fish per capita per year. Some eat hundreds of kilos per capita per year (Figure 1). The formal economies are also often quite heavily dependent on fishery resources, such as tuna (Figure 2).
- Resources are severely pressured and decreasing. It is an accepted fact that most fishermen tend to say catches are worse now than before; it would be useful to examine the data, but subsistence fishing is rarely well documented. Existing figures grossly underestimate and don't reflect catch trends. An exception is American Samoa where a study has reconstructed subsistence catches over the last 50 years or so. It shows that catches are much higher than official estimates and, more worrying, an alarming downward trend indicating that subsistence fisheries are collapsing or at least are no longer a main protein source in American Samoa.
- Population is increasing. Some countries have some of the highest population increase rates in the world, for example, 3.5 percent in Solomon Islands.

- Traditional governance systems co-exist with modern governance that has often been imposed or assumed, and that is shown more and more to be ill fitted to island situations. Corruption is infamous and possibly increasing. Mismanagement, whether due to lack of skills or corruption, may be linked to the centralized systems that reduce the connection to the local people, and therefore, reduce accountability.

There's an urgent need to address marine resource management as a fundamental issue in the South Pacific Islands. Communities are worried about shoreline erosion, pollution, and other issues, but two principal concerns that are raised time and again are lack of income and lack of fish (or more difficulty in getting fish). Even isolated communities now have a cash



Eighty percent of the population in the South Pacific lives in small rural areas and remote islands and villages.

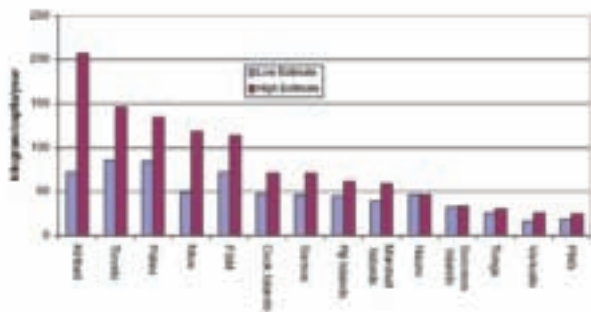


Figure 1. Ranges in Annual Per Capita Fisheries Consumption of Pacific Island Countries in the 1990s (Gillett & Lightfoot 2002)

economy and need money for certain goods and services. Both governments and communities have identified a need for the fish to be back and the marine resources to be strong again. How can we solve these problems?

In terms of income generation, the experiences in the South Pacific are bleak. Many government and NGO income-generation projects have been tried. We've collected a list of mistakes that should be avoided in the future, the need for more careful approaches and cost-benefit analysis, and so on, but we have seen few success stories, no guiding lights, and no remarkable instances of outsiders coming in and solving the income-generation problem. We need a more systematic approach to address this very high priority for the communities, but for the moment, the way forward is far from clear in this regard. More achievable perhaps could be increased fish catches, which might affect income and can certainly provide more security.

What can we do to get the fish back? Worldwide we've seen many examples of how to manage fisheries (although more on how not to!). Some are traditional, some promoted from outside, and some exist in both cultures. There are fishing reserves, gear restrictions, quotas, command and control, patrol boats, and so on. But what would be appropriate in the South Pacific?

A major hurdle in the South Pacific is money. If overall government expenditures can be considered an indicator of funds available for resource management, you see a very marked difference between the money that governments in the United States, Australia, and New Zealand can spend per capita or per kilometer coastline on resource management as compared to Solomon Islands, Papua New Guinea, and Vanuatu (Figure 3). A log graph of coastline against the total government expenditure per capita reveals three clear groupings of countries: Rich, developed Western countries with many tens of thousands of dollars per capita; middle-income countries—Cook Islands, French Polynesia, New Caledonia—which have either heavy subsidies from outside or major sources of income, such as phosphates; and the poorer countries, which have only hundreds of dollars per capita of gross government expenditure available and probably only a minute fraction of that going into resource

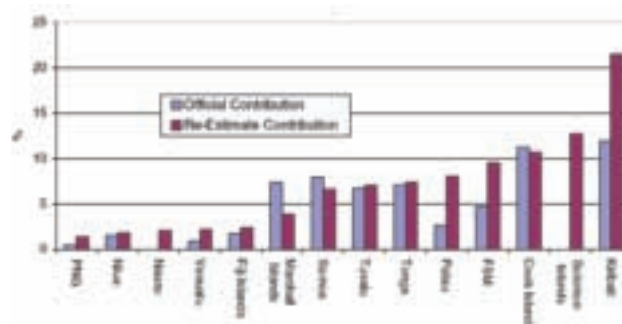


Figure 2. Official and New Estimates of Fishing Contribution to the GDP of Pacific Island Countries, 1999 (Gillett & Lightfoot 2002)

management. We're working mainly in those latter countries where the bulk of the population and natural resources lie, but to be managed through a "cash-free management" approach. That's the downside.

On the upside, we have some rarely realized assets that don't usually receive a dollar value. These are the local and traditional assets—social capital if you like.

Examples of local social capital include traditional taxonomy (e.g., the devil clam, *Tridacna tevoroa*); village elders (walking libraries with a hundred years of personal experience and hundreds of generations of traditional knowledge); less destructive traditional fishing techniques (e.g., Fijian fish traps); and traditional resource management tools such as taboos widely used in the Pacific (e.g., a taboo marked by *namele* leaf in Vanuatu).

One of the fundamental ingredients of co-management approaches touted as the latest thing in the West is resource rights. And yet most of the islands have systems of resource rights, sometimes clearly mapped out such as the traditional

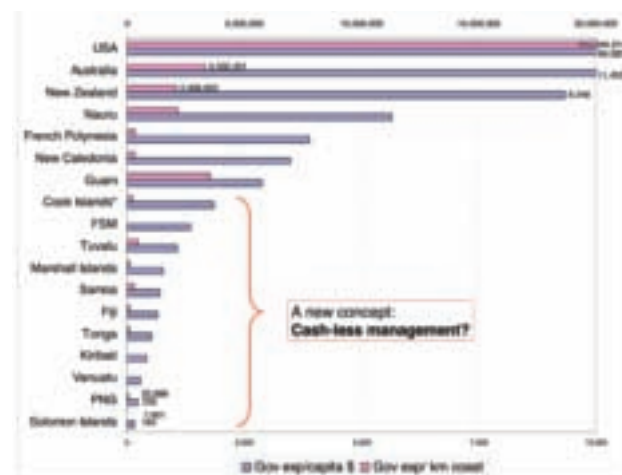


Figure 3. Government expenditures per capita and per kilometer coastline on resource management.



Some huge assets are tradition and social capital.



Communities are emerging as a fundamental building block for coastal resource management throughout the South Pacific.

fishing grounds of Fiji, the *qoliqoli*. We still have time to invest in this social capital.

So “bringing the fish” back apparently needs techniques and processes that don’t rely much on external inputs, and a lot of the skills, curricula, and approaches developed or acquired from outside so far may not match local needs. Instead, we need to rely and build on existing strengths in traditional and local knowledge and governance, and have them linked to and supported by national and regional authorities and other agencies.

The new resource governance paradigm we are looking at in the South Pacific involves different roles for local, national, and

regional actors compared to those usually assigned in Europe, Australia, or the Americas (Figure 4). Local or community-based management will bear the burden in the inshore areas, benthic, and near-shore resources; national agencies will take on management in the seas beyond village control; and national and perhaps international management for mobile, offshore, and highly valuable resources, like tuna. Of course, these levels of management are not independent. There are no clear boundaries between the levels of governance, and successful national management will depend on how well the various levels can interface and mesh together.

Over the last 10 years or so, hundreds of communities have actively managed coastal resources in Fiji, Samoa, Solomon Islands, Vanuatu, and Papua New Guinea, proving that community-driven management is not only feasible but the only feasible approach to date. Probably most of the South Pacific countries can show at least two or three community-run sites by now. Some project sites are over 10 years old and have functioned sustainably, unlike the externally imposed marine protected areas (MPAs), which have either proven very costly or have failed or both.

One of the common features of the community-managed sites is they’re driven by sustainable livelihood approaches. These sites are not usually aiming specifically to conserve biodiversity. The population didn’t say, “Let’s save the turtle.” They said, “Let’s get some more food on the table,” amongst maybe other interests. Conservation is a spin-off. Once communities have set up closed areas, have improved their fish catches, we can measure improvements in other biodiversity factors.

Another common factor in these successful approaches is that the roles played by government and other outsiders have shifted from top-down to supportive and facilitating roles. It works

MARINE RESOURCE GOVERNANCE FRAMEWORK IN SOUTH PACIFIC ISLANDS



Figure 4. Levels of governance

where skills and tools used are locally appropriate. They may in some cases have been inspired from outside, but they've been adopted and developed to fit the local situations.

The institutions that will be looking after local governance are quite often traditional institutions, but sometimes institutions are modified or transformed to adapt to management in the modern context. These "hybrid" institutions may be a traditional institution like a church group or the village council, but may develop new roles in resource management or in connecting to fisheries departments or other services. We need to be open to the ideas coming from communities and local offices of what sort of institutional support may be needed.

We need to be sure what sort of a governance system is going to be in place before we can be clear that we're building the capacity to implement it. We should ensure that we're building on existing strengths. If we don't, we often find that we're actually eroding them.

So what kind of marine education is needed to support the models or the model of resource governance we're going to be seeing in the South Pacific? It will need to meet the current and future livelihood aspirations of the South Pacific communities. It will have to be holistic and integrated and allow for community input. So we should be looking at systems of education that are inclusive and involve feedback loops, so that we can see that educated people are providing the communities with the services they want to help them identify problems, examine options, and plan actions.

At the local level, some of the needs are site-specific knowledge of ecology, user impacts, and decision-making roles and processes. It's not enough to know the grouper's life cycle. It's important to know groupers in the specific local context, what kind of groupers the community has and where they are spawning in their communities, and so on. But this can be



Local governance needs site-specific knowledge of ecology, user impacts, and decision-making roles and processes.

achieved through the input of local knowledge and not outside academic research necessarily. They also need to know the impacts that they and outsiders are having on the resources.

As village communities work to identify their problems, outside information may help them understand their situation and certain tools may be developed that are useful for facilitators. Tools and games can be very useful during the planning process to help communities understand connections in the ecosystem and the impacts at different levels of the food chain. With the help of villages, we've developed posters that provide ideas on things like larval drift. Before we go to print, we spend years identifying the tools that are needed in the community by communicating with them to find out their gaps in terms of knowledge. We have guidebooks, monitoring plans, and other things that people can use. These materials are free and available on the web (www.fsfi.org.fj) for facilitators or government agencies.

Management plans developed by the communities help the communities stay focused on the agreed actions to restore their resources. A big, thick document or plan is not necessarily better than a simple plan. A big plan is confusing and less open and accessible to community members, and may not be clearly identifiable with the agreements reached by community members. As part of the planning process, communities can readily create management plan maps that show current direction and location, resource areas, and areas they would like to set up as fishing areas versus closed areas. It's something they can come back to and check. They can print the plan on a poster to stick on their walls as a guidance and symbol of their joint action.

A very common theme is building understanding of traditional management and modern management. Traditional knowledge is often being lost, and the communities are asking outsiders to help them recover this knowledge as an important part of



National level governance needs include building an understanding of how traditional and modern management tools work and finding ways to promote this understanding.

their management. Another area to address is the relevance or the use of traditional and modern management tools to build synergetic or constructive ways of meeting the community's goals and purposes.

There is also the recurring theme of sustainable harvesting and alternative livelihood options. How can we make money? How can we meet our needs from these resources? Can we open our closed areas occasionally? How much can we take?

At the national level, it's important to have enabling frameworks to support or coordinate local management. Extension services, planning, and integration happen at the national level. But ultimately, the responsibility for management, the actual management action, and implementation is still happening at the local level.

The skills needed at the national level are ones that you would see in an extension service, such as in an agriculture department or an NGO. A lot of fisheries officers were trained in marine science and usually lack skills such as facilitation, the design of participatory process, community development basics, partnering, networking, and so on. The staff members we recruit usually don't have the skills that we need from the university education they receive. Therefore, we have to train our own staff and develop their skills over the years. We (and the Pacific) need generalists, the person who can look at the big picture—the interest of a community, the health, the disaster management, the marine biology, community development—and then turn their hands to facilitation, and then go home and write it up into a useful report. We need people that can cover lots of ground.

Another useful skill to have at the national level is benefit-cost analysis or simple feasibility skills to be able to cut through the “wonderful” new-fangled projects that keep arriving (and coming back) that have not been appraised. These project proposals need to be screened so communities don't keep on investing time and money in schemes that don't work.

Most of the countries have some type of national network where government, NGO staff, and ideally communities come together maybe once a year or more often, maybe they do exchange visits or share training. These networks are expensive, sometimes tedious but immensely valuable, so we invest in them. We try to link people up with others who are more advanced or have other skills so they can be mentored and form their own mini networks or exchange mechanisms there.

Roles at the international or the regional level include coordination, unity of action, and technical support that can be provided with economies of scale.

It's important to have research that is demand-driven. The communities often ask questions that we can't answer and that researchers have not yet addressed. Despite the huge amount of research that's being carried out from the Pacific,

these answers aren't there yet. There seems to be a mismatch between the needs on the ground and the topics chosen by master students and others at the university level. We need to increase the links that connect community research needs to researchers and then we need improved community access to that research.

At the regional and international levels, we're looking at policy. It's not always clear that the interests of small island states are represented at these levels. You hear a lot of talk about biodiversity in general, but you don't get the impression that the United Nations recognizes that the South Pacific communities eat their biodiversity. At this level, therefore, we need more lobbying from organizations to help promote an enabling environment so that when funds are generated overseas, they are appropriate to what can be done on the ground and reach the appropriate players.

Another regional role is linking to other networks and to information overseas. We have better access to the Internet. We can channel information to and fro. That's a very important emerging role. Networks are great. But we need to put a lot of effort into making sure they're not a waste of time and they're appropriately supported.

At the regional level, we can design formal training courses. There have been attempts at this through the University of the South Pacific and other organizations. We have also helped universities improve their targeted training. For example, the Pacific Islands Community Conservation Course is carried out by the University of South Pacific in collaboration with the South Pacific Regional Environment Programme with help from FSPI and other NGOs. Professionals who are already working in the field are brought in for four weeks of training, return to the field for three months, and then come back for a three-week roundup course. It is very successful, very flexible, targeted and applied, and even accounts for credits against higher degrees. We try to discover where the processes are at the moment in the communities. If the biggest weakness is monitoring or community facilitation, the next training will be on that topic. It's not just what we happen to be ready to do at the moment.

Another important emphasis is on “learning by doing.” There's not much point in having a workshop on community-based management if most of the people being trained are not returning to a community-based management environment. So we try to link the training with pilot sites where government, local staff, and NGOs can work together to apply and evaluate what they're learning and adapt it to their national situation.

Of course, providing marine education in the South Pacific will have its challenges, and some of these are listed below.

- Currently, national governance systems in each country have different departments for environment, fisheries, and agriculture. These tiny countries can't afford to duplicate or have trained staff in each of those departments. It's

important to see how those staff can work together to achieve multiple objectives relevant to more than one department, such as better agriculture, shoreline stabilization, and increased or sustained fisheries catches at the same time as sustaining biodiversity.

- Highly educated persons don't necessarily make better managers, hence the emphasis on more appropriate education and generalists.
- We have a problem with government and NGO turnover and keeping skills up in the ministries and the NGOs. The salaries are low in most of them, and good staff will be tempted out of their countries, or indeed, region.
- Most communities come up with MPAs, closed areas, or fishing reserves as a solution. We need to be careful about that because we're trying to generate local adaptive management—the capacity for local communities to analyze their problems and come up with solutions that will fix those problems. MPAs will solve certain problems and even have uses outside of resource management such as focusing community action, but we shouldn't be suggesting that MPAs are a panacea.
- Traditional closed areas and traditional knowledge management may not be a perfect match to the ideal management tool. Traditional closed areas may be opened or rotated, which may not be as good as keeping them closed. Communities need to know, if they want to get X tons of trochus out of their reef, whether a closed or rotating system will produce it. Many field teams are not yet equipped to support these kinds of requests.
- The "cult of the project" is a major challenge as many communities now live off of projects that never meet their objectives. The project spin-offs, such as the money spent on arts and crafts, per diems, and so on, are an interesting source of livelihood for communities (and sometimes the only benefit from such projects). But it's important to ensure that projects involve people who really want them and are committed to taking them to the agreed upon joint objectives.
- Also, it's important to ensure that NGOs and governments work side-by-side. It's important to invest in this. It's not naturally occurring nor is it as easy as it sounds because, although there have been some successes, NGOs and governments often go their separate paths and may have animosity between them.

- Science is often inclined to try to dominate situations. Monitoring, which can be a very interesting tool for communities, can become an obsession and seen as the end in itself.

As a final note, the overall governance situation in the Pacific is rapidly deteriorating. We've seen four countries in major civil strife over the last year alone, and there isn't a lot of prospect of this improving in the near future. FSPI has a governance program as well as a marine resources governance program. We feel that possibly one of the best chances of improving the situation in the South Pacific is improving the link between governance at the community level and governance at the national level, be this on natural resources, health, or other key topics. Providing communities with more options to develop systems that fit and connect to them better would increase accountability, reduce corruption, and possibly work towards a peaceful South Pacific.

HUGH GOVAN, PH.D., managed the Communities and Coasts Programme of the Foundation of the Peoples of the South Pacific International, which has members in nine Pacific Island countries and Timor Leste.

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PHOTO CREDIT

All photos courtesy of Hugh Govan

REMOVING THE BARRIERS: THE WORLD OCEAN OBSERVATORY AND A NETWORK FOR OCEAN EDUCATION IPMEC: KEYNOTE ADDRESS (DAY 3)

BY PETER NEILL

EDUCATION IS SIMPLY ANOTHER WAY OF SAYING THE REDUCTION OF BARRIERS
between information and understanding. We have, on one hand, enormous volumes of data, with more being recorded exponentially every day. And on the other hand, we have understanding of that data, a well-advanced, ongoing process. There are worldwide structures in place, millions of people engaged in that effort.

So what is education? Let's call it literacy, the connection between raw data and the understanding of a subject. Ocean literacy is understanding the ocean, ocean systems, and their impact on human beings.

What, then, are the barriers? The first one is *distance*, the physical, intellectual, or cultural distances between people, reduced by technological progress. First, it was the messenger, the printing press, the telegraph and telephone, the airplane, and now the Internet, which allows us to compress distance so that we can have yesterday addresses from Papua New Guinea; St. Louis, Missouri; Columbia, Maryland; and Brisbane and the Great Barrier Reef, Australia. The vast distances that used to take canoe people months to transverse are now reduced to a nanosecond. So, distance is a barrier that is removable.

The second is *time*. And yet yesterday, each of those participants, separated by seven time zones, was able to address us almost simultaneously. Time is also a sense of our own personal time, how we allocate our efforts through the day or year. I never like it when I hear people say, oh, I don't have time for that. All that means is that they have chosen not to allocate their time to that effort. It doesn't actually dispute the effort, itself; it just declares

that they are not willing to commit their time to that work before anything else. The barrier of time, too, can be removed.

The third is *language*, the unique and extremely powerful expression of human identity and community that enables our conversations, arguments, love affairs, and treaties in unique cultural vocabularies. Every time we lose a word of phrase from our language, we lose a piece of ourselves. But we do have larger language groups—Spanish, Chinese, English, French, or Swahili that are used for diplomacy and linguistic exchange among people of many voices around the world, reducing the barrier of language.

The fourth is *money*, a universal measure of value that is always in short supply. Frequently, financial resources may exist, but are allocated in unacceptable ways. For example, every time an organization pledges itself to education, but then only devotes some small percentage of its budget—two, three, four, five percent to educational outreach—then it should be clear that it has not made a commitment. Again, resources are available, but we choose not to use them.

It comes down, then, to the fifth barrier, *will*, the willpower, the willingness of people around the Earth to make decisions, accept responsibility, to act. It means nothing to have an educational program if it does not result in tangible action. It means nothing to have an international conference that doesn't result in tangible action. It means nothing to have a conference where people accept responsibility and then go away and fail to execute the responsibility. That is not the way to knock down barriers.

So let's accept a mutual challenge today. We are only 80 people here, but 80 is a beginning. And each one of us knows 80 more. And each one of them knows 80 more. Let's agree on an action plan to remove the barriers of distance, time, language, and money by demonstrating a collective *will* to use the best tools available to bring people together through a common subject—the ocean—defined as an integrated, global, social system that connects us all.



What is this? A pencil. A simple tool. A tool for communication and exchange. It allows a student to write something down, to record information, to transform it through intellectual process, and to communicate the conclusions. Is the Internet any different? Is it not an even more extraordinary device for interaction? Is it not now an astonishing demonstration of the democratic power of communication that was envisioned by its founders? It was from the beginning conceived as a network and networks of networks, economical, efficient, democratic, and free. And we are just starting to develop its potential to inform, educate, and bring us together.

The World Ocean Observatory is but just one example. In 1998, the Independent Commission on the Oceans recommended the creation of an Internet-base resource for information and educational service about the ocean. Remember the definition: An integrated, global, *social* system. The keyword is "social," because until we begin to understand and communicate the relevance of the natural systems to the social systems, the idea that we're going to expand public awareness and generate expanded political will is a joke. The definition demands moving beyond the conventional focus on the relationship between species and habitat, or national boundaries to the relationship of the ocean to fresh water, food production, energy production, trade, transportation, public health, technology and exploration, international finance, governance, culture, and community development.

The public still sees the ocean as *a place apart*, as a system that separates people and does not unite people. More barriers. And yet, the world was united by maritime enterprise. The world was united by immigration across the seas. That immigration, that reallocation of human assets, continues: Boat people fleeing oppression, taking to the sea to seek liberty and opportunity, to raise themselves up from poverty. The ocean is an extraordinary scape for human endeavor, and until our students, our policy-makers, our politicians, and our fellow citizens understand that truth, we will have not succeeded in our educational purpose.

For the purpose of these Proceedings, rather than describe in writing, let me invite each of you to visit the World Ocean Observatory at www.thewo.net. You will find there five key elements: *The Cultural Ocean*, links to UNESCO, maritime heritage organizations and publications, marine art, literature, and song, and exemplary program in coastal culture around the world; *The Physical Ocean*, links to the UN Atlas of the Ocean, UN Intergovernmental Oceanographic Commission, Millennium



Assessment Goals, NOAA, NASA, Census of Marine Life, International Polar Year, UN Law of the Sea, and climate organizations; *The World Ocean Directory*, a global directory of 18,500 ocean-related organizations and 7,000 individual subscribers; *The World Ocean Forum*, a daily posted ocean news service, a monthly letter on key ocean topics, monthly events linking experts in the field with classrooms around the world, audio and video downloads on ocean issues, other media and publications, and an editorial blog; and *The World Ocean Classroom*, a catalogue of online educational resources, curriculum, ocean schools, data visualizations, and profiles of ocean exemplars. The site changes and grows everyday. All content and services are available *at no cost to the users*. Last week, the site was visited by users from 142 nations!

We are here in Hawaii to demonstrate this capacity by linking today with experts on coral reef conservation and strategies for their protection. Our presenters are speaking to you *live* from Washington, DC, the Great Barrier Reef, and South Australia. We will be posting their remarks and related material on the W2O site in the future. Our hope, however, is to begin a partnership with the marine educators of the Pacific through a network devoted to removing the barriers between our information and your students through this technology. We are prepared to work with you toward unique solutions, overcoming the limits of distance, time, language, and money to provide our services to you in a collaboration that is as powerful and dynamic as the ocean itself. We look forward to partnering with you all.

PETER NEILL is the founder and director of The World Ocean Observatory.

PHOTO CREDIT

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IPMEC LIST OF ABSTRACTS

BACKGROUND

The following presentations and other elements of the International Pacific Marine Educators Conference are available for viewing online at www.coexploration.org/ipmec

KEYNOTE PRESENTATIONS

Abstracts of keynote presentations provided in full in earlier pages of this journal are not included.

"The Coconut Wireless and Other Tools to Strengthen Environmental Awareness in the Pacific"

by Tamara Logan

The Secretariat of the Pacific Regional Environment Programme (SPREP) is the Pacific's key regional environmental organization working with Pacific Island countries and territories to strengthen environmental management and promote sustainable development. SPREP works primarily with government environment departments to support policy development and implementation and capacity building. In a constant bid to raise awareness of environmental issues in the region, SPREP uses a number of education and communication tools to highlight its work and the achievements of its members. This presentation will explore the ways in which SPREP aims to connect with its members and key organizations to engage them in initiatives that will support sustainable development in the Pacific Islands. It will look at ways that SPREP communicates with its members, the private sector, policymakers, and politicians to encourage greater engagement in environmental sustainability, highlighting the challenges of communicating a range of issues, in challenging environments that are not conducive to the ongoing global expansion of electronic communication tools such as email and the Internet.



IPMEC participants were generous in their handouts. The South Pacific Regional Environment Programme provided sea turtle bags, to reduce use of plastic bags, which can be harmful to sea turtles.

"Defining Ocean Literacy in the United States: Coming to Consensus, Building Momentum"

by Craig Strang

Ocean sciences in the United States are idiosyncratically absent from National Science Education Standards, state standards, curriculum, and assessments. Ocean concepts are hardly taught in K-12 schools, resulting in a decline in public attention to ocean issues. The Centers for Ocean Sciences Education Excellence, NGS, National Marine Educators Association, National Oceanic & Atmospheric Administration, U.S. Commission on Ocean Policy, and the Pew Commission have urgently called for inclusion of the ocean in science standards to increase ocean literacy. There has never been consensus, however, about what ocean literacy is or what concepts should be included in future standards. Scientists and educators had no guidance in prioritizing the content they present or in determining how it fits into an over-stuffed American science curriculum famous for being "a mile wide and an inch deep." In 2004, one hundred scientists and educators participated in an online workshop, "Ocean Literacy through Science Standards," to determine the essential information everyone should know about the ocean. Following several more meetings and extensive scientific and public review, the community agreed on an Ocean Literacy definition, seven essential principles and 44 supporting concepts. The overwhelming acceptance and quick, far reaching use of resulting documents is a tribute to the inclusiveness of the development process. In 2006, we began development of an "Ocean Literacy Scope & Sequence." It shows how the principles and concepts build in developmentally sound learning progressions across grade spans K-2, 3-5, 6-8 and 9-12, and guides teachers, curriculum developers, and scientists as to what concepts are appropriate at various grades. Achieving consensus about what should be taught resulted in nationwide attention and unprecedented momentum for Ocean Literacy and provided common language for scientists and educators working together. It has not, however, considered what changes might be necessary to adapt the ocean literacy definition for other Pacific countries.

CONCURRENT SESSION PRESENTATIONS

Presentations are listed by the last name of the primary presenter. Authors and co-authors not present at the conference are not listed.

"Aliomanu Limu Restoration Project"

by Kalei Arinaga

Kauai is loved by many, but cared for by few. The challenges we face are complex and the resources to meet them are limited and very slow in coming. Regardless, in our classrooms at Kapa'a Elementary School, we have moved beyond the "What ifs?" and research/testing of our 'Aliomanu Limu Restoration Project. We have opened the doors of our classrooms to let

Kaua'i, our place, be our laboratory. By studying the demands placed on our island, our students are taking an active role in restoring species and encouraging better stewardship. The goal of our project is to reintroduce limu manaua (*Gracilaria coronopifolia*) back on the reef. Through this effort we have created and enhanced working relationships between government specialists, community members, scientists, and fourth-grade students of Kapa'a Elementary School EXCEL. For the last two years, students have been taking an active role in the project. Their deep engagement in the project allows them to easily share their learning with their peers at school, their families, and the community about the history and preservation of the edible and medicinal limu, and unite those whose goals include keeping this part of the Hawaiian culture alive and sustaining the Kauai ecosystems.



Teacher Kalei Arinaga and her fourth-grade students presented a demonstration on limu (seaweed) via the web from Kapa'a Elementary School on Kaua'i.

"Mahonia Na Dari Runs a Marine Environment Education Program (MEEP)" by Anaseini Ban

The Marine Environment Education Program (MEEP) is conducted to secondary schools via a voluntary approach introduced eight years ago. MEEP covers marine biology, ecology, geography, threats, and impact prevention. This is aided with the use of audiovisual resources and practical outdoor activities. MEEP gives participants a hands-on experience learning about the marine environment. Components of MEEP had been inserted into the reformed national primary school curriculum in the environmental studies and community living syllabus. Although, MEEP operates within West New Britain Province, marine studies content is reaching schools around Papua New Guinea via the curriculum. MEEP is also used by many other groups, including, elementary and primary students and teachers, local community groups, dive operations, church groups, and trainee teachers. The basic MEEP structure is used but amended to suit the level of the groups. The attitudes of communities and church groups are changing as MEEP creates community marine educators by training youths. This helps provide accessible information to the community using the local language.



Anaseini Ban delivered her presentation on the Marine Environment Education Program via the web from Papua New Guinea. The relocation of IPMEC from Fiji to Hawai'i hampered her plans to participate in person.

"Forming Research-Education Partnerships Across the Pacific: From Palau to Hawaii"

by Erin Baumgartner and Kanesa M. Duncan

We describe a workshop model for collaboration between scientists and teachers. University of Hawaii graduate fellows in the U.S. National Science Foundation Graduate K-12 program shared their knowledge of teaching science through inquiry while learning about Palau's biology and culture from local scientists, natural resource managers, and educators. Like other island ecosystems, the aquatic habitat in Palau and in Hawaii is directly tied to the adjacent terrestrial ecosystem. Both island chains are ecological hot-spots that have been dramatically altered by anthropogenic forces. The workshop engaged Palauan teachers in processes they could use to provide research-style scientific experiences for their students. The facilitation of partnerships between the teachers and scientists in Palau provided the opportunity for teachers to communicate with practicing scientists and to gain expertise in the practice of science. Our research during the workshop indicated positive experiences, and follow-up analysis showed successful utilization of workshop components in the teacher's classrooms. This indicates that the workshop was a successful model for shifting teachers' thinking about how to conduct science education. The workshop model was also successful at creating connections between researchers and educators, both within Palau and between Palau and Hawaii.

"The Associate of Science Degree in Marine Sciences at the College of Micronesia, National Campus, Pohnpei (FSM): The Problem of Transferring to a Higher Education Program" by Allain Bourgoin

An analysis has been undertaken to compare the curriculum of the associate of science degree in marine sciences offered at the College of Micronesia (COM)—National campus with corresponding academic programs offered at the University

of Guam, the University of Hawaii system, and the Hawaii Pacific University. The prerequisites needed in sciences by the associate-degree students wishing to transfer to a bachelor's program were equally analyzed. At the associate-degree level, it was noted that within the general education core requirements, there is high level of similarity between institutions, although the number of credits may vary somewhat within the disciplines. Within the requirements for the major or the target "certificate," the marine science program from the COM largely compares with the other associate programs, credit wise and in the diversity of electives offered. But when wishing to transfer to a four-year program in marine related sciences, the students from all programs analyzed appear to be lacking a strong basic scientific background and consequently are ill prepared to integrate into the bachelor's programs. How could these programs be revised in order to better bridge and harmonize credit transfer between institutions of the tropical Pacific nations?

**"Experiential Learning in Higher Education:
Linking the Marine Classroom and Community"**

by Karolyn Braun

This presentation focuses on experiential learning in higher education. While recent literature suggests that experiential learning is a necessary and vital component of formal instruction in colleges and universities, controversy never-the-less exists among scholars and educators about its place and use. The American Samoa Community College's Marine Science Program faculty recognizes this need to provide experiential learning opportunities into their courses and programs to make learning more relevant for their students. Topics of discussion will be current state-of-the-art practices in experiential learning, with suggestions for program design and development. Program deliverables will be showcased.

"Service Learning and Marine Education"

by Karolyn Braun

The cultural and environmental service-learning exchange program at the American Samoa Community College (ASCC) is designed to benefit our community while allowing students to learn and develop through active participation in thoughtfully organized work experiences. By involving students in these activities, they learn the two-way street of service: When you give, you receive; when you receive, you give. American Samoa and Hawaii are both tropical Pacific Island communities that share cultural history, bio-geographic origins, and environmental challenges. These are some of the reasons that American Samoa has been asked to be part of the Hawaii Pacific Islands Campus Compact, a collaborative Environmental Service-Learning exchange program. The Compact develops faculty expertise and peer-mentoring relationships in service-learning pedagogy, as well as authentic partnerships among Hawaii Community College, ASCC, and the community-based stakeholders. In addition to the five ASCC students who will participate in the project, with their five counterparts from Hawaii Community

College, the target group includes other ASCC students, faculty and support staff, National Park of American Samoa, American Samoa Department of Marine and Wildlife Resources, residents in the project areas for stream restoration and invasive species eradication, and users who will benefit from trail restorations and educational displays and signs created as part of this project.

"Pacific Ocean Blue Armada Beachcombing"

by Harry Breidahl

The Australian based Southern Shores website (<http://www.southernshores.auz.info>) has been a worldwide web presence since 2001 and is about to take on a major revision in 2007. A new section called "Blue Armada Beachcombing" is planned to be part of this revision. This section will be a combination of the well-tested beachcombing and biological survey sections of the existing website. It will also be based on community response to the beachcombing pages, especially the many reports of beach-washed ocean drifters such as by-the-wind sailors and the Portuguese man-o-war—members of the delightfully named Blue Armada. Even though Southern Shores is an Australian website, these reports of Blue Armada strandings have been from a range of Pacific nations. Therefore, with support of IPMEC delegates, it could be possible to build a web-based Pacific Ocean Blue Armada community monitoring program based on beachcombing finds of these amazing oceanic drifters.

**"Developing a Community Stewardship Guidebook:
Getting Involved in Caring for Hawaii's Coastal
Resources"**

by Athline M. Clark and Petra M. MacGowan

Coastal communities statewide have become increasingly interested in taking a part in co-management of their marine and coastal resources. This trend towards stewardship of coastal resources has been increasing over the past decade. Communities across Hawaii have organized to care for their marine resources with a variety of approaches. Over the past three years, the Division of Aquatic Resources has been working with many of these communities and associated non-governmental organizations to document these examples of stewardship. Initially, communities were asked to contribute to a set of case studies that summarized their efforts. As more and more communities became interested in getting involved, it became necessary to formalize some of the methods being utilized and to develop a guide that additional communities could use to start their own programs. The guidebook was written to assist communities in every aspect of coastal stewardship from how to organize, to education approaches, biological, human use and water quality monitoring techniques, and the like. It also includes contact, funding, and information resources. The guide was written in concert with the Community Conservation Network (CCN) and field tested at a workshop hosted by CCN and others. Representatives from nearly 20 communities statewide were given a chance to review the guide and provide comments prior to its completion. This paper will examine the

approach taken to develop the guide and outline the contents of the document.

"Navigating Change: An Educational Voyage of Discovery and Awareness" by Andy Collins

Navigating Change is an educational partnership that promotes stewardship of Hawaii's unique natural environments through educational voyages, a five-part curriculum, and teacher workshops. The partnership was founded in 2002 and, since that time, has conducted educational voyages, such as *Hokulea's* voyage to the Northwestern Hawaiian Islands in 2003. The have trained hundreds of educators in the use of the five-part multimedia curriculum. Come and learn about the curriculum and opportunities and get involved in this exciting project. Copies of the *Navigating Change* curriculum will be distributed to attendees.

"The Environmental Education Model for the 'Conservation Conferences for Children Program' Acuario Mazatlán, Sinaloa, Mexico"

by Angeles Cruz-Morelos, Raquel Briseño-Dueñas, and Dolores Monterrubio-Alvarez

The Pacific Coast of Baja California and the Gulf of California as our bioregional frame and sea turtles and birds as our umbrella species are the major subjects in the "Conservation Conferences for Children Program." Every year, since the creation of the program in 1987, Acuario Mazatlán coordinates and brings together an amazing team of scientists, educators, instructors, volunteers, cooks, drivers, sponsors, and consultants, from different government and private institutions and organizations, to support all the activities and take care of 100 kids that spend a complete week in Mazatlán learning, sharing, and enjoying their environment. The program has been improved and enriched over the years, and our model of education proves that environmental education can transcend when principles, values, capacities, resources, willingness, and convictions coincide.

"Establishment of a Moku 'Aha (Traditional District Council) in Hawaii: Using Expert Traditional Cultural Practitioners and Hawaiian Science to Ensure Sustainability in Ocean Ecosystems"

by Leimana DaMate and Robert DaMate

Native Hawaiians have been managing and sustaining their specific districts and areas in the Hawaiian Islands for thousands of years using Hawaiian science and traditional methods. However, with the incredible influx of tourists, new residents, and technology over the past 100 years, the ocean resources in the Hawaiian Islands are in danger of a serious decline if serious effort is not made to protect sustainability. Local government, through a Western scientific approach, has not been successful in addressing sustainability methods. In the past, Native Hawaiian cultural practices have been relegated to myth without serious consideration by government. However, through a "Moku 'Aha" approach, proven traditional cultural scientific

methods can be integrated into general communities through a hands-on approach using educational means. Communities are empowered; the Native Hawaiian culture is perpetuated; and logical proven Hawaiian science is implemented. This fulfills the government mandate to protect Hawaii's natural resources and ensures ecosystem sustainability.

"Salvemos la Playa: Proyecto Comunitario"

by Margarita Diaz

The chaotic urban growth along the coastal zones in Mexico has caused severe damages along its coasts, particularly in Baja California. Despite the fact that Mexico has approximately 11,122.5 kilometers of coasts, its development depends mainly on land-based economic activities and has largely "turned its back to the sea." There is not even a legal definition for "coastal zone" rooted in our Constitution, an omission reflected in the rest of our Laws. For the past six years, Proyecto Fronterizo de Educación Ambiental (PFEA) has coordinated a community volunteer project named "Salvemos la Playa" in a coastal community in Tijuana, Baja California, Mexico, featuring the implementation of two yearly beach cleanup campaigns, which have involved a total of 2,200 persons and removed 14,500 kilograms of debris from this beach. The greatest accomplishment has been getting so many residents to recognize the value of a healthy beach and begin taking an active role in conserving it. Our goal is to achieve a balance between population growth and conservation of our beaches, based on a collective vision and action strategy that includes citizen water quality monitoring activities, citizen patrol, and biodiversity conservation.



Margarita Diaz from Mexico and Hani Nusantara from Indonesia enjoy a light moment during a field trip to the Hawaii Institute of Marine Biology on Coconut Island.

"Exploring Alternatives on Community-Based Coral Reef Management: A Case Study from Beloi, Atauro Island, Timor-Leste" by Leo X.C. Dutra

Beloi is a community of 350 inhabitants located in Atauro Island, Timor-Leste (East-Timor). The community depends mainly on coral reef linked fisheries resources for their livelihood. High fishing pressure in the reefs, associated to some

destructive practices, contributes to the reduction of the fish stocks in the vicinity of Beloi. This problem will be aggravated in the future through population growth linked to the incipient tourism industry. Therefore, options for managing food security, income generation, and cultural aspects into the longer term are investigated in order to foster an environmentally-economically-culturally sustainable future. The organizational learning framework, upon which our methodology is based, offers a dynamic systems learning community of practice setting wherein all stakeholders (scientists, local community, governmental, and non-governmental agencies) are able to systematically explore the understandings and perspectives of others in a controlled dialogue process. In this paper, we argue that through adaptive learning processes, where communities are engaged in conversations, all interested stakeholders are able to develop shared understandings of their system and these understandings will help them identify and articulate current issues and opportunities, directions for change, and sometimes innovative ideas about pathways through which to realize long-term ecological-economic-cultural sustainability.

"Ecosystem-Based Management (EBM) and Traditional Healing—Bridging Science with Tradition and Local Knowledge" by Monifa Fiu

The traditional healer functions as an integral part of the ecosystem and seascape. Through the practices of a traditional healer, all is connected by a complex world webbed with diverse plants and herbal remedies from the forest, for healing. It is said that when there is healing, the medicine bundle is thrown to sea but returns to land during ebbing tide bringing back with it healing powers to the shores, sifting to the mangroves and upstream, flowing further inland back to the forest. The traditional healer's many herbs reflect biodiversity in the forest, and that life is very much connected to the integrity of a system. The ecosystem-based management (EBM) approach is not any different in recognizing the strong interactions between forests, riversheds, and coastal systems to fashion management across sections of the entire ecosystem. This is exemplary at the district of Macuata where an entire coastline connected by tributaries of the Dreketi River, the largest river in Vanua Levu (largest island in Fiji), traditionally share one fishing ground that is fringed by the Great Sea Reef, third largest barrier reef in the world. Messaging the philosophy of the traditional healer in the EBM process is important to integrating local resource use, knowledge and practices, as well as managing for resilience across these systems. Additionally, functional services of a system and a healer in traditional society are at risk by the commanding effects of climate change. There are the climate witness stories of the salt-maker and the kuta mat weaver as master traders of their natural surroundings to prove it.

"LäjeRotuma Initiative (LRI): Mainstreaming Community-Based Conservation and Interpreting Marine Science to the Island Community of Rotuma, Fiji Islands" by Monifa Fiu

Rotuma, a 43 km² volcanic island about 465 kilometers north of the Fiji Islands, like other Pacific Islands are experiencing adverse impacts of climate change, as well as faced with the challenges of managing their resources. Rotuma has been politically part of the Fiji Islands since 1881; however, the culture more closely resembles Polynesian islands to the east and the people enjoy a comfortable standard of living with plenty of food and adequate housing. LRI was initiated to maximize the future environmental and sustainable options for Rotuma. Its main goal, to set up an environmental education and awareness program, is community-based where youth are encouraged to proactively participate in activities aimed at accessing and sharing information to strengthen the capacity of the island community in management of natural resources. LRI focuses on pertinent issues raised by the community in its environmental awareness outreach. Evidently, there is shifting baseline of local knowledge on islanders' use of resources and the state of their environment. This will then advertently affect fisheries, food security, and reduction of coastal vulnerability. LRI's main vision, to mobilize the island community of Rotuma and to manage their natural resources, has resulted in creating environmental awareness by making connections of local knowledge with science, to build community resilience.

"Improving the Informal Education Skills of Marine Recreation Providers to Raise Environmental Awareness and Reduce Tourism's Footprint on Coral Reefs" by Liz Foote

Discover the efforts of the Coral Reef Alliance (CORAL) in engaging the marine recreation community in proactive solutions that reduce threats to coral reefs worldwide. CORAL has developed a targeted approach to train marine tourism providers in informal pedagogic strategies for effectively communicating key environmental messages to their clients. Resources, tools, and techniques are provided that integrate informal learning and marine recreation with the goal of promoting Best Practices and preserving coral reef ecosystems. Participants will take part in a simulated, interactive training that demonstrates sustainable reef recreation while modeling effective conservation messaging.

"Preliminary Assessment of Persistent Organic Pollutants in Rarotonga Lagoon, Cook Islands" by Imogen P. Ingram

The authors present a lagoon water-sampling project (funded by NZAID) in which government and educational agencies cooperated to build the capacity in a Cook Islands non-governmental organization. The Cook Islands Ministry of Marine Resources was supportive because this Persistent Organic Pollutants (POPs) sampling program complemented its own programs.

The University of the South Pacific School of Marine Sciences staff advised in collation and interpretation of the results and in report-writing. In order to determine whether there were residual traces of POPs in the Rarotonga lagoon, samples were collected over a 12-month period from December 2004. These were sent to a New Zealand laboratory for analysis, providing much-needed data. The presence was detected of POPs, indicating that further work is needed, perhaps using other media such as animal tissue or marine sediments, to give a clearer picture. Sharing this experience with other educators might encourage similar collaborations in other countries. It is felt that monitoring of the environment empowers community groups by teaching them new skills and reducing apathy that stems from a sense of helplessness. Only through research can the cause of environmental problems be determined, and expert local knowledge will result in a greater likelihood of generating appropriate countermeasures.

"Time-Series Analysis and Hands-On Coral Reef Education in the Marshall Islands" *by Dean M. Jacobson*

The Republic of the Marshall Islands is becoming increasingly aware of the vulnerability and ecological importance of coral reefs, yet most citizens continue to regard coral as merely "rock" and do not understand the interdependence of healthy fish and coral populations. At the College of the Marshall Islands, students are provided with hands-on experience with coral reefs. I will illustrate how photographic time series (up to four years in length) of permanent reef sites illustrate processes difficult to visualize in situ (i.e., growth, disease, mortality, etc.). The time series strategy is being elaborated in a new coral mapping project. All coral colonies within a specific 100 meter reef flat quarry pool (blast-mined in 2001) are currently being mapped, using GPS and underwater photography. The student-collected data will document growth rate and survival of individual, labeled corals and fish diversity, which is expected to change over time as coral growth and diversity develops through time. (Currently 12 coral spp. and 42 fish spp. are found in the pool.) Macro-algal data will also be collected. By institutionalizing this project, many years of valuable data will be generated regardless of changes in biology staff, helping students better appreciate the dynamic nature of both coral reefs and the scientific process.

"Accommodating Traditional Conservation and Fishery Management Practices in the Face of Western Colonization: The Western Pacific Community Development and Community Demonstration Project Programs" *by Charles Kaaia*

The deterioration of traditional fishery and subsistence systems is a serious constraint to sustainable development in some island communities. The past few years has seen the resurgence in the desire among indigenous island people to rebuild their traditional fisheries and expand access to the fisheries in the seas that surround their islands. In addition, there is growing interest in investigating contemporary applications of traditional

conservation methods used by indigenous Pacific Islanders. The Sustainable Fisheries Act of 1996 established, in statute, the Western Pacific Community Development Program and the Western Pacific Community Demonstration Project Program. These two programs share eligibility criteria. The Community Development Program makes possible administrative actions by the Council to address barriers to the participation of native people in fisheries managed by the Council. The Community Demonstration Project Program provides grants for projects that demonstrate and promote indigenous cultural and traditional fishing practice, management and conservation, community education, or research and the acquisition of materials and equipment needed to carry out such a project. The Western Pacific Regional Fishery Management Council has an opportunity to accommodate this growing interest in traditional fishery conservation and management practices through the Council process. The presenter will discuss the history, successes, and challenges of these programs.

"2006 Year of the Sea Turtle: Mobilizing Communities to Save a Pacific Icon" *by Megan Krolik*

Turtle numbers in the Pacific are reducing rapidly due to factors such as non-sustainable consumption, illegal trade, habitat destruction, and harmful fishing practices. In 2006 in response to this, the Secretariat of the Pacific Regional Environment Programme (SPREP) and its key partners coordinated the Year of the Sea Turtle campaign to increase awareness of the importance of sea turtles in the region and to reinvigorate the cultural relationship Pacific Islanders have traditionally shared with the sea turtle. The campaign has three key objectives: To promote the conservation of sea turtles by reducing adverse impacts from human activities; to promote sustainable management of sea turtle populations and their habitats; and to engage partners in regional conservation and awareness activities to promote the connection between individual actions and conservation initiatives. These key objectives have been achieved through a series of education and public awareness activities held throughout the region, raising the profile of the need to conserve these ancient mariners through increased collaboration and partnerships by governments, private sector, and community groups.

"Bringing Ocean Literacy into the Classroom" *by Mellie Lewis*

This presentation will guide participants through the process of bringing ocean literacy into the elementary classroom. We will discuss each of the seven ocean literacy principles and the accompanying fundamental concepts. A lesson plan focusing on each principle will be presented. Participants will have the opportunity to play an interactive game, "Kure Waste Chase," which introduces students to the dangers of marine debris. In addition to lesson plans, participants will receive "Ocean Literacy: Essential Principles and Fundamental Concepts" brochures, Ocean Adventures magnets, and Seafood Watch cards. The session will conclude with an opportunity for participants to form a network of marine educators.

"Challenges and Opportunities for Marine Education through Tourism" by Jasmine Mason

Orcas, the most widely distributed mammal on Earth besides humans, have fired the imagination of peoples from across the world for many thousands of years. The resident orcas of the Pacific Northwest are probably the most photographed whales in the world, with tourists coming from around the globe with a purpose and anticipation only tourists can have. Tourism provides a huge source of willing learners and a captive market for environmental education. Capturing their enthusiasm for the purpose of educating them can be challenging, but at the same time can be very effective. Discuss the challenges, benefits, and rewards of using ecotourism as an effective forum for marine education, with a focus on the whale watching industry in the Pacific Northwest.

"International Coastal Cleanup (ICC): Student Project" by Barbara Mayer and Chris Woolaway

The ICC Student Project involved about a hundred Hawaiian eighth grade (13-year-old) students as part of a community service and ocean stewardship middle school team goal. The project was composed of three parts: (1) A pre-field trip classroom lesson about ocean currents around Hawaii that cause the islands to be a trap for marine debris, the previous year's ICC data, graphics of marine debris in Hawaii, and a practice activity in small student groups to sort, according to ICC categories, marine debris previously collected by the teacher; (2) a field trip to participate in the annual ICC; and (3) a post-field trip classroom lesson to graph and discuss the similarities and differences in marine debris at different locations along the beach.

"Establishment of Support Teams: A Decentralization Process to Sustain Resource Management Intervention at the Province Level in Fiji" by Semisi Meo

The Fiji Locally Managed Marine Areas (FLMMA) Network, since its formal inception in 2001 has put in place a systematic engagement process that has worked well with communities. This approach has resulted in the proliferation and epidemic of the community's interest throughout Fiji. To reach out to communities in a consistent basis would acquire a substantial amount of funding and human resources, which the limited resources of FLMMA are not able to complement. The establishment of support teams based and operating at the provincial level is an effort aimed at decentralizing the role undertaken by FLMMA. The operation of support team advocates a more organized way to assist provincial governments and organizations in coordinating their roles and functions for each community. This approach is being carried out in three provinces in Fiji, and the progress has demonstrated motivating outcomes. One of FLMMA's concerns is the tenacity of the community's involvement in allowing a smooth disengagement process from communities. The formation of support teams has the potential to strengthen institutional support at the government level and provide a simple access for communities in the area, hence, complementing the disengagement process.

"Marrying Traditional Values and Sciences Mechanism in an Effort to Sustain Community Conservation Efforts in Fiji" by Semisi Meo

Conservation initiatives by the Locally Managed Marine Areas Network in the Asia Pacific region manifest a recognition of the importance of involving local communities completely, especially indigenous populations, in sustainable management of marine resources. Past practices by conservation practitioners were, in principle, adamant on the fulfillment of their donor driven objectives without flexing a turn to building community for the sustainability of the initiative. This paper highlights on the community resource management approach that promotes adaptive management and capacity building for local communities, in order to cement the sustainability of their conservation efforts. This approach ensures the involvement of key respective social groups and communities in a collective effort of formulating a practical community resource management action plan that incorporates the social, economic, cultural, political, and demographic structure of the community. The combining of key complementary elements in traditional and scientific aspects brings about a motivation on their effort for communities to respect and comply, hence, leading to its sustainability.

"Strengthening Village Governance: An Approach to Underpin Communities Effort in Sustainable Development and Resource Management in Fiji" by Semisi Meo

The sustainable management of resources is a common goal in almost all the countries in the Asia Pacific region. Most conservation agencies and practitioners servicing in this area have indicated successful partnerships with communities. This is through awareness and education with participatory means, thus developing community resource management action plans. However, in most cases, the implementations by communities are not carried out diligently for reasons such as conflicting roles in communities and their formed groups and linking this to the policymaker's level. This is due to the fact that community management planning is focused in restoring dwindling marine resources, but the systematic organization of people in their villages is a challenge to be undertaken. This paper highlights an integrated community resource management approach that recognizes to strengthen village governance in order to generate unambiguous functional structure for communities to sustain any village development, in particular resource management. The understanding of the internal groups in the community and their core functional roles is the key to guide them in implementing sustainable resource management.

"Sustainable Reefs: An Education Program for Youth and Communities" by Richard Murphy and Allamanda Amituanal

Created at the request of village elders in Savusavu, Fiji, the Sustainable Reefs program presents an understanding of reef ecology, the value of reefs to people, threats to reef health, and

alternatives for sustainable reef use. Based on field tests in Fiji, the British Virgin Islands and American Samoa, this program is now being implemented around the world in conjunction with the United Nations Small Islands Developing States program, UN Environment Programme, UN Educational, Scientific and Cultural Organization (UNESCO), the International Coral Reef Action Network, Reef Check, and the Marine Aquarium Council. *Sustainable Reefs* consists of culturally appropriate, multi-media educational resources, including a DVD/video, introduced and concluded by a well-known and respected local hero or spokesperson; the cartoon book *Treasure on the Reef* translated in the native language; an interactive Power Point show on coral reefs for student outreach; a primary grade ocean and coral reef curriculum with teacher's guide; an overview of critical reef issues; and an extensive list of additional web-based coral reef lesson plans, activities, and other resources. Jean-Michel Cousteau's, Ocean Futures Society and the local educational community (often non-government organizations or the Ministry of Education), form a collaborative partnership to implement the program. The program begins with a series of school presentations to students and educator workshops, involving the Ocean Futures education team. After these initial activities, the program is carried out by our local partners. Our recent implementation of this program in American Samoa, with the Fagatele Bay National Marine Sanctuary will serve as a case study to describe the program. It is our intention that these educational and entertaining materials will engage young people in thinking about the value of reefs and that, with an understanding of basic ecological principles, they will become better stewards of their coral reef resources. Ocean Futures Society is actively seeking local partners to implement the Sustainable Reefs program in any country that has coral reefs.

"The Conservation Mosaic: A Model for Multinational Marine Conservation" by Wallace J. Nichols

The conservation mosaic is a model program for social change and the protection of highly migratory species, with potential application in other areas of social change and environmental conservation work. The goal in the case study presented is to reduce poaching and bycatch of endangered sea turtles in the eastern Pacific. Preliminary results indicate positive changes in partner communities, increased numbers of sea turtles on nesting beaches and foraging grounds, and an emerging "sea ethic." Over the past decade, we have developed this approach to sea turtle conservation in the Californias (U.S. and Mexico) through the integration of three strategies: 1) Facilitate the growth of a diverse international NETWORK of fishermen, students, teachers, activists, researchers, funders, managers, indigenous community members, and other coastal citizens; 2) draw on these relationships to understand threats, generate new KNOWLEDGE, and develop practical solutions; and 3) empower local leaders to facilitate COMMUNICATION and sharing of these solutions and knowledge through an array of resonant media. The novelty, simplicity, and effectiveness of our methodology are based on in an integrated, innovative approach informed

by regular evaluation and monitoring. We have adapted and exported the conservation mosaic model to community-based projects focused on leatherback turtle conservation in Indonesia and shark conservation in the eastern Pacific, among other projects. However, the model should prove useful across the range of conservation and social change programs.



Fred Nucifora delivered his presentation via the web from the Great Barrier Reef HQ Aquarium in Australia.

"Reef Videoconferencing—On the Cutting Edge of Environmental Education" by Fred Nucifora

Reef Videoconferencing is an initiative of the Great Barrier Reef Marine Park Authority through its education program Reef ED. Wherever you are in the world, you and your students can experience the Great Barrier Reef with Reef Videoconferencing. During this underwater fact-finding mission, classrooms, lecture theatres, conference venues, and even boardrooms are virtually transported to the Coral Reef and Predator exhibits at Reef HQ Aquarium (the world's largest living reef exhibit). State-of-the-art videoconferencing technology is used to unlock unique teaching and learning experiences, including information delivered *live* by a scuba diver. During 2005-2006, Reef HQ Aquarium has delivered Reef Videoconferences to over 2,300 students both nationally and internationally. International locations have included the USA, France, UK, New Zealand, South Africa, Japan, and Greece. The latest example of how Reef Videoconferencing has been used for learning and leading with technology was when a group of students from Venetie, Alaska, came to school on snow sleds and went for a virtual dive on the Great Barrier Reef. Reef Videoconferencing is also now being used to facilitate an ESL (English as a second language) program to students in Greece. The primary aims of Reef Videoconferencing from Reef HQ Aquarium, the Education Centre for the Great Barrier Reef Marine Park Authority are to share the uniqueness of the Great Barrier Reef with the community (on a national and international level); encourage and stimulate understanding of the issues surrounding the Great Barrier Reef from social and environmental perspectives; provide opportunities for students to share knowledge and interact with each other in a fun and

educational setting; develop knowledge and understanding of the Great Barrier Reef; engage students and exemplify attitudes, values, and patterns of behavior that will empower them to make effective contributions to the ecologically sustainable use of the Great Barrier Reef; and enable students of all ages from all over the world to see thousands of live reef creatures, watch them interacting, and discover the latest reef research.

"Increasing Marine Conservation Awareness through Curriculum-Based Competency in Local Primary Schools" by Hani Nusantara

Indonesia has more than 17,000 islands and is the largest archipelagic nation in the world. Indonesia has nearly 33,000 square miles of coral reefs and it's a home to a third of the world's total corals. Although Indonesia's coral reefs are the most extensive and diverse in the world, they are also the most threatened. Human activities such as destructive fishing and unregulated tourism have contributed to coral reef degradation. One of the problems is the lack of awareness of the marine environment. There is a need to increase awareness and motivation for marine conservation among local coastal community members. Investing in education for children, as the part of the coastal community, could make an important contribution to developing marine conservation awareness for the future. Through curriculum-based competency, local schools have the opportunity to base their local curriculum on coastal and marine environments, particularly coral reef ecosystems. This research will provide an opportunity to explore the primary school students' perspective about coral reef ecosystems, and how curriculum-based competency could encourage them to increase their awareness of coral reef conservation, particularly, and marine environment conservation, generally.

"Utilizing the Sea Grant Model to Foster Ocean Literacy" by Diana Payne

This session will feature the efforts of more than 30 Sea Grant programs in the United States and internationally to highlight successful practices that may be used as models for marine educators in the Pacific. Environmental stewardship, long-term economic development and responsible use of coastal, ocean, and aquatic resources are at the heart of Sea Grant's mission. Sea Grant is a nationwide network (administered through the National Oceanic and Atmospheric Administration [NOAA]) of university-based programs that work with coastal communities. Through a variety of partnerships, Sea Grant seeks to educate future professionals and leaders, as well as enhance marine and aquatic literacy among the general public.

"An Ecosystem Approach to Chilean Fjords in Southern Patagonia" by Luis A. Pinto

One of the last remains of undisturbed water bodies in the world corresponds to the Chilean fjords in southern Patagonia. The coastline of southern Chile (below 41°30'S) stretches 1,600 kilometers to Cape Horn and covers an area of almost

240,000 km² creating a system of channels, fjords, and sounds. The region is rugged, being composed by hundreds of islands, two glacial fields, and the Darwin Mountain Range. Only during the last 10 years have Chilean researchers been systematically exploring the area to understand the physico-chemical and biological characteristics of the fjord ecosystem. There is an increasing usage of the area for extensive commercial aquaculture, which may be causing an impact on the system with pressure over a rich cold-water biodiversity. The continuous presence of harmful algal blooms in the area is also of serious concern to subsistence economy. It is of the utmost importance to educate society to actively promote sustainability within these marine ecosystems. One of our current marine education programs has been conceived to engage teachers and students into an exciting scientific exploration of Chilean fjords. It is also an open invitation for all those young explorers to come and visit one of the least known regions of the planet.

"International Projection of Highly Stimulating Marine Science Projects for Middle and High School Students" by Luis A. Pinto

The Center AquaSendas, a non-for-profit organization in Chile, is developing a series of engaging marine science projects for middle and high-school students that deal with global change. Based on current knowledge about the effects of a climatic planetary change, we designed a science program where students use local water bodies such as coastal embayments, wetlands, and fjords as natural laboratories to understand and discriminate between natural and anthropogenic changes. The Oxygen Minimum Zone, El Niño Southern Oscillation, and the Humboldt Current System are marine phenomena we study with a multidisciplinary approach designed to engage students through discovery, observation, and measurements to promote analytical skills, language acquisition, stewardship, and equity as part of their learning process. Part of the equipment used during the field sampling, such as water and sediment samplers, have been built by the students themselves. By using the ongoing Argo International project as a resource, students are enabled to explore how the ocean is responding to global change. Students "Adopt a buoy" following its track, collecting salinity and temperature data. We expect to have in 2007 a network of Latin American middle schools participating on this international effort.

"Networking among a Community-Based Organization, a Marine Research Center, and Public and Private Sectors as a Model for Capacity Building among K-12 Science Teachers" by Luis A. Pinto

Center AquaSendas, a community-based organization addressing marine issues through K-12 innovative hands-on aquatic science programs, has been successful in the inclusion of the private sector, a Marine Research Center, and a governmental department to improve capacity building among K-12 science and technology teachers. These apparently unrelated sectors of the

society are becoming painfully aware of the poor performance of our K-12 students in national scholastic assessment. High-school graduates are ill-prepared in science and technology subjects when entering college, conflicting with the high standards required to achieve excellence in engineering, science, and technology careers. In light of the disturbing results, there is a pressing need for innovative ways to include other actors with revitalized ideas and proven experience. Cooperation with outside partners to develop a marine science programs is helping teachers improve educational programs at their schools and empower the school community. Close collaboration with the above institutions is increasing the access to resources, the ability to serve larger audiences, the selection of partners who add certain expertise or a different perspective, visibility, and community goodwill. Application of a management model based on local participation is causing a shift in how science and technology can be taught in our K-12 schools.



Solialofi Tuamu from American Samoa, Leo Dutra from Brazil, and Luis Pinto from Chile enjoy an informal networking session.

"Survey of the Understanding towards Marine Science Education Differences between USA and Japanese Marine Educators" by Tsuyoshi Sasaki

Survey of the differences of understanding towards marine science education between USA and Japanese marine educators was conducted using a questionnaire method. Both sides believe that marine science education is important for citizens to have a concern of the ocean (K-12 educations are also needed), but both sides aren't concerned about the ocean and marine science education in the same way. U.S. marine educators have a strong consciousness about environmental conservation and think that the ocean is a good field for scientific research or leisure activity. On the other hand, Japanese marine educators have a strong expectation that the ocean is a place of seafood production (not only fish but seaweed) and a place of leisure activity. These results suggest that U.S. and Japanese marine educators have a different way of thinking about the ocean.

"Awakening Understanding and Putting Together the Pieces: The Role of a Marine Educational Center in Hilo, Hawaii" by Linda Schubert

NOAA's Mokupapapa Discovery Center opened its doors to the public in 2003 to increase awareness of the Northwestern Hawaiian Island's rich biological diversity and cultural heritage. Since that time, we have seen our audience grow to 56,000 people a year. Come and hear about how we bridge the miles between one end of the Hawaiian Archipelago and the other through exhibits and educational programs. Highlighted programs will include our summer youth program that brings topics such as tide pool exploration and Polynesian voyaging to life for local children.

"Working Together towards Saving Our Planet and Oceans" by Leonard Sonnenschein

After years of planning, a global mission of scientists, community leaders, organizations, institutions, and governmental departments are starting a plan of action to deal with issues of pollution of our oceans and waterways, overfishing, global warming, and working towards sustainability through developing local actions. On January 1, 2007, 15 actions were announced that will begin immediately in over 50 countries affecting millions of people that may just start changing the tide of impending doom. Because of the efforts of the Concert for the Oceans Foundation (CFTOF), over \$250,000 is being committed to start to directly impact several million people. The word concert is used to create the embodiment of many voices who through celebrations are intended to raise the spirits of people towards positive actions to save the planet, the oceans, and to preserve our climate and save ourselves. The initial series of events will culminate on the weekend of World Ocean Day June 8, 2007, to celebrate the initiatives and actions convened previously, as well as to identify renewing and emerging actions. Each individual is hoped to be inspired to take action to reduce the human environmental footprint through reducing pollution (fuel consumption, chemical, solid waste, and biological), campaigning for pro-environmental policy, preserving the world through wise use of foods and protection of natural spaces, and supporting local environmental groups in spreading information and promoting actions. Communicating will occur through press conferences, press releases, calls to action collaboratively disseminated through local organizations, gala events, concerts, television, radio, Internet, phone messaging, billboards, and other forms of advertisement. Funding and actions are contemplated to occur over a 10-year period in order to ensure the widest and deepest possible pragmatic application. The Concert for the Oceans (www.CFTO.org) is a call to action, an opportunity for an awakening to the state of our planet.

"Including Sustainable Fisheries in Classroom Curricula" *by Sylvia Spalding*

Getting a sustainable fisheries message—based on science—in class curricula in the U.S. takes some effort and ingenuity. The Western Pacific Regional Fishery Management Council has pursued a variety of initiatives, including guest presentations, a TV series and teacher guidebook, and one-day teacher workshops on the seafood industry. Lessons show the connection between the seafood on one's plate and resource harvesting activities, as well as ways to successfully manage human activities so fishing and eating fish can be enjoyed in the future. The Council has also partnered with a local public school to offer a summer course on marine resources to high school students. The success of the course lies in its ability to teach students to see the connection between what is taught in the classroom and what is happening in the real world—their world. Globally, the U.S. is the third largest seafood importer, and our national consumption rate of seafood is increasing. Given our dependence on the ocean for food, more focus on the "people component" of the ocean seems warranted in the U.S. classroom, if we are to have ocean literate citizens who make political decisions and consumer choices that consider ocean resources from a global perspective.

"Public Marine Education Projects Promoting Coral Reef Conservation in the Commonwealth of the Northern Mariana Islands" *by Teny Topalian*

The Commonwealth of the Northern Mariana Islands (CNMI) has some of the most beautiful coral reefs in the world. The CNMI is composed of an island chain consisting of 15 islands. The southern islands include Saipan, Tinian, Agiguan, Rota, and Farallon de Medinilla and are mostly raised limestone, sloping platforms protected by barrier reefs and well-developed fringing reefs to the west. The largely uninhabited northern islands—Anantahan, Sariguan, Gusan, Alamagan, Pagan, Agrihan, Ascuncion, Maug, Uraxas, and Farallon de Pajaros—are mostly volcanic, including some active volcanoes, and have much less reef development. There are six marine protected areas, including Managaha Marine Conservation Area, Bird Island Sanctuary, Forbidden Island Sanctuary, Trochus Reserve, and Sea Cucumber Reserve, which are in Saipan and Sassanhaya Bay Fish Reserve in Rota. This presentation will be a discussion of the different projects the Pacific Islands Regional Office of NOAA in Saipan has initiated and implemented that promote the protection of the coral reefs of the Commonwealth of the Northern Mariana Islands. Some of the projects that will be discussed include workshops for teachers and principals; marine attitude and knowledge surveys; school visitations; radio programs; forums for local fishermen of Chamorro and Carolinian descent; interviews with fishermen; workshops for fishermen; and the development, publication, and distribution of marine educational resource materials.

"Community-Based Wetlands Management Program in American Samoa" *by Solialofi Tuauimu*

The Community Based Wetlands Management Program was formed in 1993 and is a bottom-up resource management program in which the village actively participates in managing, conserving, and protecting its wetlands. It is a learning process for both the government and local villages. Thus, the community is empowered and therefore more likely to accept and follow the self-created plan. The opposite is the traditional top-down regulatory approach where the heavy hand of the government and the law rule. Looking into the future, one looks at these resolutions and delineations as the foundation upon which active resource management, including preservation, conservation, restoration, and utilization (agriculture, ecotourism, aquaculture) spring from in a united effort.

"Networks of Learning and Learning Networks"

by Peter Tuddenham

What are some of the characteristics of networks of learning and learning networks for International Pacific Marine Educators to consider? Some ideas, lessons learned, and reflections from working in and with existing marine education networks, the U.S. Ocean Literacy process, 20 years personal experience with online learning networks, and networks of learning will be presented. Design considerations for networks of learning and learning networks from architecture, to online social networks will be summarized.

"Sacred, Heritage Pride—Protect our Sea Turtles"

by Christianera Amituana'i Tuitele and Meredith Speicher

The Territory of American Samoa's RARE PRIDE campaign chose the green sea turtle as its flagship species for various reasons: Green sea turtles are endangered; it is American Samoa's sacred reptile; 2006 is the Year of the Sea Turtle in the Pacific Islands; and historically, it is our heritage to hold onto the Fa'asamoa (Samoan way of life) of which sea turtles are a part. The flagship species (green turtle) not only represents the decrease of turtles found in our territorial waters, but it also represents their habitats and marine resources that are in need of conservation. RARE inspires people who live in the planet's most bio-diverse places to embrace conservation with an agenda to change attitudes and behavior towards the environment. The RARE module has been adopted to accomplish year-round educational activities and projects. A pre-survey identified the community's knowledge of sea turtles; the importance, threats, and habitats of the turtles; and the project's objectives and activities. Two stakeholder meetings were done to involve the community from various backgrounds and professions in the planning process. A post survey will be conducted throughout the Territory to identify local knowledge on sea turtles after the year-round campaign.

"Networking as a Tool for Marine Education in the Pacific Islands: Potential Role of the USDA Land Grant Program of the College of the Marshall Islands in a Pacific-wide Network" *by Nacanieli Tuivavalagi*

The College of Marshall Islands Land Grant Program (CMI-LGP) comes under the College of Micronesia Land Grant Program (COM-LGP). Aquaculture has been a key program area in COM-LGP, and in its next five-year plan (2007-11), one of the eight activity-areas is "conservation of biological diversity." This requires education of youths and adults in the school system, as well as those in the community. However, education is a two-way process, and LGP staff members expect to learn much from the community as well. At the CMI-LGP, the Aquaculture Scientist and Agriculture Scientist have been working on developing a training program to be offered at their field station at Arrak, Majuro atoll, where students, high school teachers, and members of the community could attend a training program in marine science and also cover agriculture and other land based activities that have an impact on marine life. These two scientists have wide experience in networking and collaborative activities in the various regions of the Pacific, including Melanesia, Micronesia, and Polynesia; and in this paper, they share their experiences and views on formation of a regional network and discuss how CMI-LGP could contribute to such a network for marine educators in the Pacific.

"Community Participation in the Upper Gulf of California/Colorado River Delta Biosphere Reserve: Lessons from 25 Years" *by Paloma Valdivia*

The Upper Gulf of California and Colorado River Delta of northwestern Mexico are recognized worldwide for their socio-economic and ecological importance. High productivity and habitat diversity historically supported important fisheries and high biodiversity. Today endemic species like Vaquita (*Phocoena sinus*) and Totoaba (*Totoaba macdonaldi*) are threatened with extinction. Many fisheries are in decline. Tourist developments threaten coastal habitats. Causes of this environmental degradation include 1) open access to fisheries, overfishing, and non-selective methods; 2) decreased flow of the Colorado River; and 3) inadequate planning and management. In 1993 a marine protected area was established to offer solutions, but lack of information and resources and increasing social conflicts challenge progress. The Intercultural Center for Study of Deserts and Oceans (CEDO) initiated educational activities in the region in 1980 before environmental degradation was evident. Initial programs focused on the ecosystem and species. Later specific issues were addressed with local communities and decision makers. Today programs integrate traditional knowledge, science, and community participation to create models for community-based conservation. With a 25-year trajectory, participants have included fishers, oyster growers, developers, school children, and teachers. The current challenge is to multiply the successes and develop permanent local capacity to keep pace with accelerated growth.

"The 2006 International Youth Coastal Conference"

by Andrew Vance

The first International Youth Coastal Conference (www.youth-coastalconference.com) was held in Melbourne in October 2006. It was part of a process that involved students working with expert mentors many months prior to the event and resulted in some amazing presentations from children who are motivated and have high self-esteem and respect for others. Using the Kids Teaching Kids model, the 2006 International Youth Coastal Conference provided students with skills in marine and coastal education, but more importantly, it showcased students who are optimistic, have a sense of future, are capable public speakers, and can communicate ideas in many different forms. Most importantly, the process for this conference was about promoting kids teaching kids as the highest form of learning as we aim for a cultural change in the way we view, use, and perceive our natural environment. The 2006 International Youth Coastal Conference was less about a conference and more about a lasting commitment to our youth and the sustainable use of our marine and coastal resources and environment.

"U.S. National Marine Fisheries Service, Pacific Islands Regional Office's Protected Species Workshops"

by Lewis Vanfossen

Sea turtles, marine mammals, and seabirds are protected from harvest and taking by U.S. and international laws and are considered *protected species*. The National Marine Fisheries Service's Pacific Islands Regional Office Sustainable Fisheries Division conducts protected species workshops to educate owners and operators of U.S. federally permitted pelagic longline vessels about protected species and applicable laws. U.S. Federal regulations require that vessel owners and operators attend these workshops and be certified annually. At the workshops, fishermen and owners are given instruction on identification, handling and release techniques, and regulatory requirements for protected species occurring in the Pacific region. Instructors convey this critical knowledge to fishermen through media such as presentations, demonstrations, videos, and printed materials. The protected species workshops also provide fishermen with a means to voice concerns and give suggestions to improve mitigation techniques and future regulations. About 250 fishermen are trained in Hawaii and about 100 fishermen are trained in American Samoa annually.

"Communicating Marine Conservation Results: The Two Levels" *by Ron Vave*

A majority of people living in Fiji and the Pacific live along the coastline and, as such, depend on marine resources for their subsistence and commercial livelihood. Communities, however, have noted these resources to be dwindling and have sought assistance from the Institute of Applied Science to help them conserve resources for future generations. To this end, local

communities are trained in biological and socioeconomic data collection, analysis, and interpretation. This paper highlights a case study on how community conservation practitioners are trained to collect data pertaining to marine conservation efforts, and the means of how they can effectively disseminate the results to two distinct audiences; the local community and to partner organizations (including government). At the local community level, the use of tallying and totals of results is used and information relayed to wider community audiences using simple bar graphs. To partner organizations, the community collected data is analyzed using t-tests for within site comparisons (MPA versus Control) and meta-analysis is used to compare results from within and between countries in the Asia Pacific region of the Locally Marine Managed Area (LMMA) network.

"Imi O Na Ala O Ke Moana (Learning the Ways of the Oceans): An Evaluation of Ocean Education and Marine Tourism Practices in Hawaii" by *Carlie Wiener*

Over the past 10 years, there has been a dramatic increase in the marine tourism sector. Island communities have economically benefited from this fascination with marine life, creating a multimillion-dollar marine tourism sector. While funds are being generated from marine resources, rarely are the negative impacts of these sensitive ecosystems evaluated. Government, non-government organizations, and private businesses need to create more extensive interpretation programs, as they often fail to evoke a sustaining concern for environmental issues. While awareness may be encouraged through these outlets, participants remain oblivious to the direct impact they have, failing to get involved in solutions. In an attempt to draw parallels between marine tourism and education, this presentation will examine current interpretation programs that are provided through the marine tourism sector in Hawaii. A comparative analysis will be done through recreation and tourism programs and advertisements amongst several of the Hawaiian Islands. Structured snorkel and scuba diving programs and marine mammal swim programs (including whale and dolphin watching) will be evaluated. Using cross-comparative analysis, the research demonstrates a need for improved interpretation programs in marine activities that foster a stewardship ethic among tourism participants.

POSTER PRESENTATIONS

"The Keys to Science Education" by *Karolyn Braun*

The Keys to Science Education was a comprehensive training and professional development program that took a cadre of middle school and upper-elementary teachers through a two-week workshop of experiential institutes in marine science education facilitated by practicing sciences and exemplary educators. The institutes gave American Samoa teachers the opportunity to extend their understanding of the marine and terrestrial environment and to develop strategies and curriculum resources for effectively utilizing the oceans, coastal, and

terrestrial environments as a teaching tool. This was accomplished by engaging the participants in a 10-day field based institute during the summer with extensive follow-up activities and continued support.

"Our Fluid Earth: A Multidisciplinary Approach to Aquatic Science Education for Grades 9-12"

by *Kanesa Duncan and Erin Baumgartner*

This presentation describes *Our Fluid Earth* program under development by the Curriculum Research & Development Group at the University of Hawaii. The current Fluid Earth and Living Ocean (FE/LO) is a widely disseminated marine science program for grades 9–12. Results from education research are being used to revise the course materials (last updated in 1995) into a more widely useable format, and we will be soliciting feedback from meeting participants and educators in the Pacific region. Our additions highlight the important critical thinking skills needed by students. We have also restructured the focus to general aquatic systems in order to teach about the connected nature of terrestrial and aquatic environments, which is an especially important concept for Pacific Rim societies. We have incorporated project-based instructional modules that (1) allow students to identify and resolve a scientific question and (2) engage students in activities connected with their world. Our curriculum theme is ecology, which allows teachers to use biological systems to introduce physics and chemistry by connecting the abiotic features of the environment to the organisms living there. Activities targeting the nature of science are integrated within the curriculum, as are activities connecting marine, freshwater, and terrestrial systems.

"Ecosystem Approach to Fisheries Management in the Western Pacific Region" by *Jarad Makaiau*

The "ecosystem-based" approach to fishery management has been promoted since 1986 by policymakers, fishery management agencies, and environmentalists worldwide, including the President's Commission on Ocean Policy, the Pew Ocean Commission, NOAA, and the UN Food and Agriculture Organization. The Western Pacific Regional Fishery Management Council is in the process of changing its species-based fishery management plans (FMP) to place-based fishery ecosystem plans (FEPs). Existing FMPs for insular resources (bottomfish, crustaceans, precious corals, and coral reef resources) are being restructured as archipelagic fishery ecosystem plans (FEPs). These include a Mariana Archipelago FEP (for Guam and the Northern Marianas Islands), a Hawaii Archipelago FEP, an American Samoa Archipelago FEP, and a Pacific Islands Remote Island Areas FEP (for islands and atolls of Baker, Howland, Jarvis, Johnston, Palmyra, Wake, and Kingman Reef). An existing FMP for pelagic resources will become a Pacific Pelagic FEP. The structural changes will facilitate the incorporation of ecosystem-based principles in the management of fisheries in the federal waters (generally, 3 to 200 miles offshore) surrounding the U.S. Pacific Islands. A major component of the FEPs is the emphasis

on greater community involvement and integration of traditional environmental knowledge into the Council's management and decision-making process.

"Integrating Conservation into the Culture of Gau Island, Fiji" by C. Brooks, L. Brown, S. Hart, W. MacLennan, S. Pace, and H. Rousham

Gau Island, the fifth largest in Fiji, supports a population of ca. 6000, with fishing traditionally providing an important source of dietary protein. The island supports fringing reef around its entirety and has an extensive barrier reef located on its western side. Although traditional fishing techniques prevail, the reefs of Gau are under greater pressure from increasing human population and more technological, but less sustainable fishing methods. Following consultation with the University of the South Pacific, every village around Gau has voluntarily established a Locally Management Marine Area (local version of MPA). Since April 2006, Frontier Fiji has been assessing the status of the fringing reefs of Western Gau and providing relevant information to the local inhabitants. Frontier Fiji aims to increase local working knowledge of MPAs and promote sustainability of the marine resources. In order to be successful, conservation must integrate fully with local needs and culture. By raising awareness, for example, of the plight of Fiji's marine turtles and introducing sustainable methods of harvest, the inhabitants of Gau may continue to enjoy turtles in future generations. Working closely with Lomani'Gau Council (Guardians of the Island) and with the local schools, Frontier Fiji hopes to further integrate conservation into the culture of Gau.



The island of Gau was scheduled to be a field trip destination prior to the relocation of IPMEC to Honolulu due to the December 2005 coup in Fiji.

"Teachers without Borders" by Barbara Mayer

Teachers Without Borders (TWB) is a non-profit (501c3), non-denominational, international NGO founded in 2000, devoted

to closing the education divide through teacher professional development and community education. The organization focuses on the building of teacher leaders. The work occurs primarily, but not exclusively, in developing countries, in order to build self-reliance, health, and capacity. The table at IPMEC will feature the TWB Republic of South Africa project that has worked with math and science teachers over the past six years. By conservative estimates, a half million students are benefiting from their teacher's upgraded skills. This grass-roots program has also provided the opportunity both for professional development and public service to more than 30 U.S. (Hawaii) teachers in six years—a life-changing experience, and ultimately one which benefits students in U.S. classrooms. In the words of one of the South African administrators of the program, "to see colleagues from opposite ends of the Earth share knowledge and culture with such great warmth and caring, is a sight to behold. This is an example of international cooperation and global understanding at its best."

"Experience-Based Learning at Its Best: Using a Wildlife Refuge and an Endangered Species as a Case Study to Promote Stewardship" by Lindsey Peavey

To date, approximately 97 percent of natural habitat in San Diego Bay (SDB) has been lost due to development. In June of 1999, 3,940 acres encompassing South SDB was made a Wildlife Refuge, which is now home or stopover to numerous endangered and threatened species of plants and animals. The SDB, and especially the Wildlife Refuge, is an area that the local community must take ownership in protecting into the future. Increasing the significance of the refuge is its close proximity to the U.S.-Mexico border, integrally linking it to other ecologically important wildlife areas that merit immediate attention and protection. Our goal in reaching out to the communities of San Diego is to promote stewardship and expand the public consciousness of the urgency of conserving the dwindling natural resources in the region. The Southwest Fisheries Science Center (SWFSC, <http://swfsc.nmfs.noaa.gov/>) monitors a population of endangered green sea turtles that feed on rare eel grass beds and, although unusual, stay as year-round San Diego residents. This provides an excellent educational resource to the community. Each year Pro Peninsula leads almost 300 sixth grade students from Southern San Diego on field trips to SDB to observe scientists from the SWFSC's Marine Turtle Research Group as they study the green sea turtles that inhabit SDB. Using South SDB and its endangered green sea turtles as a case study, the students are exposed to an international conservation effort and learn why scientific research and community activism go hand-in-hand when protecting natural resources, wildlife, and habitats. This unique program serves low-income, under privileged students, many of whom speak both English and Spanish, and is generously sponsored by the Port of San Diego and the LS Power Company.

"Teaching Aid for Marine Educators in the South Pacific" by Peter Craig

Our South Pacific communities depend on coral reefs for many reasons (food, culture, coastal protection, tourism), but there is a continuing need to communicate with the public about the importance and vulnerability of these resources. How can we hope to protect coral reefs if people are not really sure what coral is? A teaching aid was developed that can be modified for use in schools. It's a booklet called the *Natural History Guide to American Samoa*. Although it focuses on American Samoa, the booklet describes some of the important marine resources found across the South Pacific region. The booklet can be used as a reference document, or change the text to fit your island locale and add your own articles. The guide is also available online at www.nps.gov/npsa/naturescience/.

"World Ocean Network's Sustainable Actions Committee and the First Findings of the Sustainable Seafood Campaign" by Leonard Sonnenschein

Since 1989, numerous surveys about bringing information to the public have been undertaken to determine the basis for setting short- and long-term goals that will create a wider awareness of the fragile state of the ocean ecosystems, identify actions we can do to bring about a positive conservation change, and develop tools for implementation of the United Nations World Summit on Sustainable Development (WSSD) Ocean Goals. This information has been gathered on local, regional, national, and international bases. Goals are set to achieve these defined needs to accomplish the mission of developing tools for implementation of the WSSD Ocean Goals: Achieve greater sustainability of ocean resources, achieve decrease in pollution activities, and achieve mechanisms for better environmental understanding. Since 2002, the Sustainable Seafood Campaign has been developed and actions have been taken towards identifying and implementing best practices towards balancing the consumer need for seafood and nature's ability to respond. Reports of the findings from surveys for global implementation will be distributed. In 2007, the World Aquarium, chair organization of the committee has announced its \$15 million, 10-year program expansion: Concert for the Oceans Foundation. www.cfto.org

"USC Sea Grant Parent Child Program" by Lynn Whitley

The University of Southern California (USC) Sea Grant Parent Child Education Program (PCEP) is aimed at making basic science concepts approachable and fun for parent and child together, as well as developing a sense of environmental stewardship. PCEP is usually based at an inner city school or community center; participants in Southern California are primarily Latino and African-American. As a team, parent and child attend a short course in marine/environmental science which focuses on the urban/ocean connection and includes a field trip and culminating project. Many of these participants have never been

to the beach or seen the ocean and have no understanding of how their actions can impact the marine environment. Through the innovative PCEP learning process, parent-child teams gain an elementary understanding of science and develop an increased regard and sense of responsibility relating to local environmental issues. Additionally, PCEP introduces effective communication techniques, initiates thoughts of new and exciting future career paths in marine, environmental or social science, and fosters a lifelong interest in science and quality of self, family, and home. While created for a U.S. Southern California marine environment, this model program can easily be adapted for coral reefs and other environments, as well as other cultures.

VIDEO PRESENTATIONS**"Reef Videoconferencing"**

by the Great Barrier Reef Marine Park Authority

This video is referenced in Fred Nucifora's oral presentation (see abstract above) delivered from Australia. 40 minutes.

"Hawaiian Blue—The Encounters" by Ziggy Livnat

The Encounters was born of 400 dives (day and night) and over two years of filming. The 45-minute video gets you up close and personal with the marine life wonders that surround the main Hawaiian Islands. The stars of the film are corals, fish, urchins, crabs, octopus, turtles, sharks, manta rays, dolphins, monk seal, and many more. The animals move to Hawaiian music, slack key guitar, and cello, from some of Hawaii's top musicians. It features English and Hawaiian animal name subtitles and optional commentary on locations and animal factoids. www.ForTheSea.com

"Hawaii Reef Etiquette PSA" by Ziggy Livnat

The Hawaii Reef Etiquette public service announcement (PSA) is the winner for Best PSA 2006 at the International Wildlife Film Festival. The PSA precisely yet whimsically teaches visitors how to enjoy, respect, and preserve the Hawaiian reefs. The PSA encourages action and shows viewers that "you can make a difference." With stunning underwater video of the Hawaiian Islands from award-winning filmmaker Ziggy Livnat, the seven-minute PSA is a visual experience that speaks to adults and children alike. It happens entirely underwater with the fish talking to deliver the message of conservation. It is based on Hawaiian lore with original musical background and narration from some of Hawaii's best entertainers. www.ForTheSea.com

"FishQuest: Fishing for Facts, Fishing for Food, Fishing for Solutions" by the Western Pacific Regional Fishery Management Council

FishQuest features fisheries in American Samoa, Commonwealth of the Northern Mariana Islands, Guam, and Hawaii, highlighting the importance of fisheries to island communities and the complexity of managing them to ensure continued

use by future generations. The Council partnered with the Hawaii Department of Education and the Pacific Resources for Education and Learning to produce this three-part television series in 2002. The program was broadcast through KidScience, an interactive distance-learning program and aired in classrooms and homes through local cable and public TV stations. Teachers were provided a companion guide containing lesson plans and student activities. The video is referenced during Sylvia Spalding's oral presentation (see abstract above).

"Get Hooked: Fishing Sustainability" by the Western Pacific Regional Fishery Management Council

This 10-minute student video won second place in the Sustainability Video Contest conducted by the Islands of the World IX: Sustainable Islands—Sustainable Strategies conference in 2006. It was produced by students participating in the High School Summer Course on Marine Fisheries and Resources, which was co-hosted by the Western Pacific Regional Fishery Management Council and Moanalua High School. This video is referenced during Sylvia Spalding's oral presentation (see abstract above).

MORE RESOURCES:

College of Exploration:

<http://www.coexploration.org/ipmec>

PHOTO CREDITS

Pages 42, 45, 49, and 51: Courtesy of Western Pacific Regional Fishery Management Council

Page 43: Courtesy of Ron Vave

Page 55: Courtesy of Joeli Veitayaki



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- **Sustainability Education in the Pacific** (keynotes: Greg Manning, Department of Environment, Water, Heritage & the Arts, Australia, and Stephen Hammond, NOAA Office of Ocean Exploration, USA)
- **Linking the Pacific** (keynotes: John Sibert, Pelagic Fisheries Research Program, Hawaii, and Sereima Savu, South Pacific Regional Environment Programme, Samoa)
- **Capacity Building** (keynotes: Joeli Veitayaki, University of the South Pacific, Fiji, and Philippe Vallette, World Ocean Network, France)

With special guest Charlie Veron, author of *A Reef in Time: The Great Barrier Reef from Beginning to End*, in recognition of the International Year of the Reef

For more details, contact Nautilused@optusnet.com.au or Sylvia.spalding@noaa.gov.

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