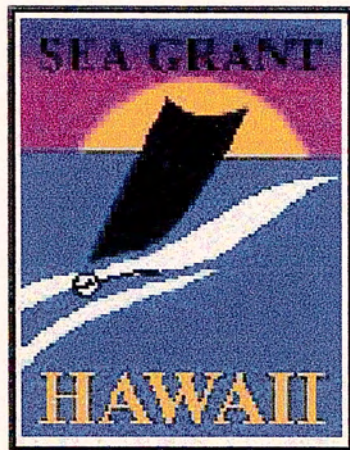


University of Hawaii
Sea Grant Extension Service



Pacific Program



University of Hawaii Sea Grant Extension Service

PACIFIC PROGRAM



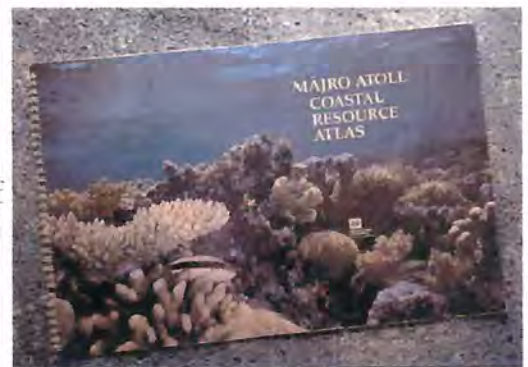
Nowhere within the jurisdiction of the United States is there a greater need for **sustainable economic development** than in the U.S.-affiliated islands of the Pacific: American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, the Federated States of Micronesia (FSM), the Republic of the Marshall Islands (RMI), and the Republic of Palau. Due to limited land resources, geographic isolation and increasing populations, these island states face an uphill battle developing a sound economic base while protecting their environment and culture. Although arable land is limited, **marine resources are rich**.

Since WW II, U.S. government support to islands focused on administration, public health, education, infrastructure support and, to a limited extent, agriculture development. Starting in 1968 and for the next decade, U.S. government interest in island development actually decreased. There was thus no funding for the University of Hawaii to help meet island needs.

In 1979 the **International Sea Grant Program** established cooperative marine extension positions with four U.S.-affiliated island governments, lasting six years. Another program component provided marine education and training to 11 South Pacific islands affiliated with the University of the South Pacific (USP). **A number of local fisheries officers received specialized training in extension techniques** and aquaculture development through this program. Several teams of UH scientists and Sea Grant extension agents joined with local USP faculty and their counterparts to carry out on-island projects focusing on locally identified, high priority marine environmental concerns. Cooperative research programs between UH and USP were planned for subsequent years.

Congress failed to approve continued funding for the International Sea Grant Program in 1982 and the southern and western Pacific extension and education programs were phased out. However, help to continue a Sea Grant Pacific island program emerged from an unexpected source. Starting in 1985, **the Hawaii Sea Grant worked cooperatively with island governments and the Army Corps of Engineers to survey and inventory coastal resources in the region**, resulting in the publication of **coastal resource atlases and inventories**. Hawaii Sea Grant helped local governments use this research to develop coastal resource management programs and co-sponsored island-wide public meetings to discuss specific details of each plan. The inventories and atlases provided **access to critical information about island coastal resources**. On-island extension agents assisted local governments with the development and implementation of their own coastal management plans, such as the **Kosrae Island Resource Management Program**, implemented in 1992.

Meanwhile, in July 1987, in an effort led by the director of Hawai'i Sea Grant and with the help of Margaret Cumisky of Senator Daniel Inouye's staff, several Sea Grant programs **sponsored a workshop** in Washington, D.C. **for U.S. congressional and agency staff** with insular responsibilities. It assessed island communities' needs and outlined how the Sea Grant network might help accomplish U.S. goals in these islands. As a follow-up, **a fact-finding group** headed by NOAA's Chief for International Programs, Thomas Laughlin, **visited the U.S.-affiliated islands** in September of that year.



Subsequent discussions resulted in a planning conference and **development of a network of on-island marine extension agents and specialists for the islands**. Thus the **Pacific Island Network (PIN, now referred to as the Pacific Program)** was formalized in 1988. NOAA, OTIA (now DOI's Office of Insular Affairs) and Hawai'i Sea Grant worked together to establish and continue these efforts. The Pacific Program focuses on:

1. Developing a network of on-site or regional extension agents specializing in sustainable resource management, conservation, and education,
2. Finding regional and federal funding to support this network, and
3. Working towards the goal of a network staffed by indigenous islanders by developing local expertise through training programs.

The Pacific Program is achieving these goals in many places in the U.S. Pacific through work with regional collaborators and partners. In some areas the extension effort has been incorporated into on-island programs, as local capacity develops. **Other efforts have now been assumed by the new consortium, MAREPAC with the same local partners**. Other programs, such as coastal erosion and capacity building and training, continue to be supported by Hawai'i Sea Grant because of its expertise in managing regional projects.

FSM

Sea Grant **established an extension agent position with the College of Micronesia-FSM in 1988** as a result of needs identified through the coastal atlas and inventory efforts in the FSM; the first such extension network position. Originally the position was funded by Hawai'i Sea Grant, NOAA and Department of Interior; this funding continued until 1999. COM-FSM, in a collaborative effort with the Pacific Program, hired Ahser Edward, an **indigenous islander** to the position in 1995. MAREPAC, the new regional consortium, is now supporting this position.



Palau

In 1993 the Pacific Program worked with the Palau Marine Resources to develop a collaborative marine extension position, subsequently transferred to the Palau Community College Cooperative Research and Extension Program (PCC-CRE). **Kevin Polloi, a former MASSIP intern (see MASSIP sheet) was hired in 1997** to focus on marine resource management and education. He remained in the position until he assumed his current role as the Deputy Director of the Palau Conservation Society. PCC-CRE, under the supervision of Anita Suta, has grown into an admirable local extension service.

CNMI

From 1991 to 1996, the Pacific Program worked with the CNMI government to establish a **marine education extension agent position**. The local counterpart for the last extension agent, based at the Department of Land and Natural Resources, became the Department's marine information specialist.

RMI

After working with the Marshall Islands on various short-term technical assistance projects, the Pacific Program collaborated with the RMI EPA, the College of Marshall Islands, and the College of Micronesia Land Grant Program to establish a **coastal resources extension position** in the mid-1990s. Although the position lapsed due to lack of local funding, **regional extension assistance in aquaculture continues to support black pearl and giant clam aquaculture** (see below.) At the end of 1999 the Pacific Program and the Marshall Island Marine Resources Authority provided short-term support for an extension position focusing on sustainable aquaculture and fisheries work. The position is now seeking collaborative funding for the position through the new consortium MAREPAC.

Guam

An existing extension agent position at the University of Guam Marine Laboratory worked with the Pacific Program on various projects throughout the Pacific in the 1980s. **The Pacific Program focused mainly on supporting aquaculture extension efforts in Guam** through the Pacific Regional Aquaculture Extension Service, PRAES, (see PRAES sheet).

American Samoa

Pacific Program efforts, focusing on aquaculture development, began in the 1980s with the International Sea Grant program. In 1992 the Pacific Program established a **cooperative relationship with the Fagatele Bay National Marine Sanctuary**. Sanctuary staff serve as Sea Grant counterparts for projects in American Samoa (see American Samoa sheet). Aquaculture extension services in continue.

Regional

The Pacific Program has helped to **support several collaborative regional extension specialist and agent positions:**

- ✓ Dr. Simon Ellis, aquaculture specialist
- ✓ Rob Mullane, coastal processes specialist, funded by Sea Grant and the County of Maui,
- ✓ Dick Croft, sponge extension specialist, now working in private business on Pohnpei,
- ✓ Anne Orcutt-Bailey, coastal resources and aquaculture extension agent, now working with Deep Ocean Water technology on the Big Island,
- ✓ Elizabeth Kumabe, regional environmental education extension agent, and
- ✓ Sharon Ziegler-Chong, regional human resources development extension agent.

Extension Network Focus Areas

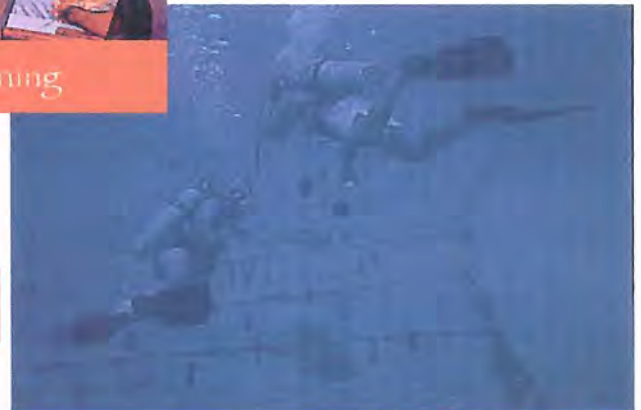
Program Areas



Coastal Ecosystem Health and Safety



Education and Training



Diversified Economic Development

The following sheets summarize some of the projects in these focus areas supported by the **University of Hawaii Sea Grant Pacific Program** over the years.

Regional Education and Training Program

Proposed Activities

- ✓ Conduct regional and local environmental education training and technical workshops in collaboration with island and regional agencies and organizations.
- ✓ Strengthen effectiveness of technical expertise and information dissemination through collaborative planning and networking among government agencies, regional and local organizations, and environmental educators.
- ✓ Strengthen environmental skills capacity of Micronesian and American Samoan students entering the workforce through internships with island agencies and organizations.



Elizabeth Kumabe Maynard
*Pacific Region Environmental
Education Agent*



Sharon Ziegler-Chong
*Human Resources
Development Specialist*

Progress

Since its inception, the Hawaii Sea Grant Pacific Program has recognized that a well-trained work force is essential to the success of resource management and sustainable environmental and economic development. Collaborative environmental education projects and programs have been developed in response to targeted needs and requests from island resource and education agencies. Selected program accomplishments with long-term goals include:

- ✓ **Operation Pathfinder**, a national marine science program offering annual two-week teacher field training workshops on coastal issues has been conducted in the region since 1994
- ✓ **Teacher training workshops** have been conducted on-island in Ebon and Majuro in RMI and Ulithi in Yap to address focused environmental topics
- ✓ **Micronesia and American Samoa Student Internship Program (MASSIP)** has successfully placed students on their home island for summer internships with natural resource agencies since 1994
- ✓ Coordination and participation in **collaborative planning meetings** for environmental management and education strategies which aim to share resources and strengthen local capacity of targeted projects
- ✓ Assistance on numerous **environmental education and outreach initiatives** with other extension agents and related resource outreach personnel ranging in topics including reef and coastal ecosystems, conservation of local endangered species, regional climate change issues, and environmental sustainability of local industries.

Impacts

The regional education and training program is another important facet of the overall **Hawaii Sea Grant Pacific Program's extension network**. The regional environmental education specialist and the human resources development specialist have helped to identify environmental skills capacity needs and facilitate the sharing of resources of different agencies and organizations to address these needs. The cooperative nature of this program strengthens important links with island agencies with similar mandates.



Environmental Education Extension Efforts in Palau

Proposed Activities

- ✓ Provide technical assistance for coastal development projects in Palau.
- ✓ Initiate and organize environmental education programs for community groups and schools in Palau.
- ✓ Provide on-island technical and logistical support for Sea Grant activities and projects, and those of its cooperating partners as requested.



Kevin Polloi, Palau extension agent.

Progress

With support from the Palau Community College (PCC) Land Grant Program and the Hawaii Sea Grant Pacific Program, the Palau Sea Grant Program began in 1994. The Palau extension agent conducted a variety of projects and training activities aimed at building local capacity and self sufficiency. The position has been vacant since the end of 1998, when Kevin Polloi stepped into a deputy directorship with the Palau Conservation Society.

Highlights of projects completed by the Agent include:

- ✓ Developing a dugong public education program in cooperation with the Palau Conservation Society (PCS).
- ✓ Coordinating retreats and meetings to help unify environmental efforts of government agencies in Palau.
- ✓ Assisting with the successful establishment of the Ngemai Conservation Area in partnership with Ngiwal State, PCS and The Nature Conservancy.
- ✓ Assisting visiting scientists from the Waikiki Aquarium, University of Guam, and other institutions.
- ✓ Participating in the Palau International Coral Reef Center meetings with delegates from the U.S., Japan, and Palau.
- ✓ Conducting education programs on locally important coastal conservation and marine issues, using outreach methods such as class and community presentations, billboards and pamphlets.

Impacts

The Palau extension program has made important contributions towards responsible sustainable economic development in Palau. The extension agent has helped local communities identify sustainable development needs, facilitated the sharing of resources between agencies to meet these needs, and served as an on-island technical information source. The cooperative nature of the position strengthens important links with island agencies with similar mandates and places our extension agent in a unique position to facilitate these activities.

Cooperating Agencies: Palau Community College- Land Grant | Palau Conservation Society | Palau Environmental Quality and Protection Bureau | Waikiki Aquarium | University of Guam | Palau Visitors Authority | Ngiwal State | The Nature Conservancy | Palau Bureau of Education | U.S. Peace Corps | Bureau of Natural Resources and Development | National Museum of Palau



University of Hawaii Sea Grant Extension Service Pacific Program
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Educational Field Guide to the Fish, Wildlife, and Protected Areas of the Samoan Archipelago

Proposed Activities

- ✓ Enhance the archipelagos natural resource management program
- ✓ Heighten public awareness and support for ecosystem protection and stewardship
- ✓ Further environmental education in local schools and learning institutions



An illustration from the Field Guide.

Progress

According to author and illustrator Meryl G. Rose, **final editing and production of the resource guide is underway**. The book will feature approximately 10 chapters covering Samoan coral reef ecology and near shore fishes and invertebrates, mammals, birds, reptiles and amphibians, terrestrial invertebrates, and protected areas of Samoa including over 500 color illustrations. Bess Press, the Honolulu-based publishing firm, expects the book to be available sometime during the summer of 2000.

Impacts

There are few publications that cover general information about the natural history of the American Samoa. **Samoan educators and resource management personnel are excited** about having a comprehensive resource manual available soon. It is anticipated that **the Hawaii Sea Grant Pacific Program** and other agencies will utilize this resource for science teacher training workshops in the future.

Cooperating Agencies: US Dept. of Interior Office of Insular Affairs | Fish and Wildlife Service | National Park Service | US Environmental Protection Authority | University of Hawaii Sea Grant College Program | American Samoa Community College Land Grant Program | Coastal Zone Management Program of American Samoa Department of Commerce | Fagatele Bay National Marine Sanctuary of American Samoa Department of Commerce | Independent Samoa Department of Lands, Surveys, and Environment | AusAID | Independent Samoa Ministry of Foreign Affairs | South Pacific Regional Environmental Program | Ie Siosiomaga Society | Bat Conservation International | American Samoa Rotary Club of Pago Pago | Seacology Foundation | Samoa Air | LeVaomatua, Inc.



University of Hawaii Sea Grant Extension Service Pacific Program
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Ebon Reef Survey Teacher Training Workshops

Proposed Activities

- ✓ Conduct teacher workshops with three island schools in Ebon atoll in the Republic of the Marshall Islands (RMI) in partnership with RMI Ministry of Education (MOE) and College of Marshall Islands (CMI)
- ✓ Work with teachers, students, and resource persons at CMI to collect information and references on the natural history and biology of the shell species through literature research and interviews with community members and local scientists.
- ✓ Develop a conservation education project with RMI MOE specialists that will help communities assess their shell resource on their reef and be able to recommend strategies to manage the shell resource for the increasing handicraft industry.



Progress

The driving concern of the reef surveying project is the **increased exploitation of the cowry resources** on the Ebon reefs which are primarily being harvested by the children for the handicraft trade. **Three 2-day reef surveying workshops were conducted** at each of the small island schools of Enekoien, Toka, and Ebon in the remote Ebon atoll in mid-October 1999. **Teachers will continue the project throughout the school year.** But students were also invited to listen; they rarely have outside speakers at their schools and were the primary target of the conservation education effort. In most cases, the RMI math specialist, Bedenin Joseph, was the interpreter. The workshop started with a classroom presentation on reef habitats, the natural history of its shell inhabitants, and the importance of accurate surveying and data collection with practice transects on the school grounds. It was important to take all the students involved in the project to practice transect surveys on the reef. The evening community meetings held to introduce the project to the parents and community leaders were of equal importance. It also gave the community a chance to welcome the project and the team members into the community.

Impacts

The training workshops were **well received by the island communities and follow-up visits are planned** by the RMI MOE math specialist with assistance by the CMI marine science program. The surveys are to continue on a monthly cycle for two years with support from a grant from the Pacific Math and Science Consortium. The community members had many questions and concerns about over-harvesting and the natural history of cowries. Questions that could not be answered by the team were turned back to the teachers and students for further investigation. The project should help to balance economic needs and the reef resource conservation on isolated

Cooperating Agencies: RMI Ministry of Education | College of Marshall Islands



University of Hawaii Sea Grant Extension Service Pacific Program
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Proposed Activities

- ✓ Facilitate the entry of island students in local and regional 2-year community college programs into sustainable development areas of study.
- ✓ Develop a pilot internship program for COM-FSM students to participate in during the summer of 1999 to work with government and private agencies in Pohnpei State
- ✓ Link COM-FSM graduates to further opportunities as they further their education through programs such as MASSIP



1999 interns with advisor and Sea Grant Agent Ahser Edward.

Progress

This internship was designed and initiated during the summer of 1999. **Six COM-FSM marine science students were selected to participate** in 6-week internships with five different agencies on Pohnpei. Two students worked for the Pohnpei Marine Resources Division on two different projects. They assisted with operations at the clam farm hatchery at Langer island and helped to coordinate other projects relating to marine resources management. The other four were placed with the National Fisheries Corporation (NFC), Pohnpei Fisheries Corporation (PFC), Micronesia Tri Marine, and the COM-FSM Sea Grant office. At the beginning of the summer interns participated in an orientation meeting with COM-FSM staff and Sharon Ziegler-Chong, MASSIP Coordinator. During the summer, the interns also met with FSM Sea Grant Agent, Ahser Edward, twice to discuss their progress. During the following fall semester the students prepared formal presentations and participated in the first annual COM-FSM

Impacts

host agencies and interns rated the pilot year as a very successful in evaluations. Therefore it will be repeated again in 2000. In the future the internship will be a regular course at COM-FSM based on a course outline developed by staff. As a result, enrollment in this marine biology course has increased substantially. From this trial project, seven students will be selected to participate in this same program in the summer of 2000, except they will be sent to the other states of Micronesia to work with the marine resources agencies. The program will be funded through Interior funds received by the Marine Resources Pacific Consortium (MAREPAC).

Cooperating Agencies: COM-FSM Marine Science Department | Pohnpei Marine Resources | National Fisheries Corporation (NFC) | Pohnpei Fisheries Corporation (PFC) | Micronesia Tri Marine



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Kosrae RARE Environmental Education Project

Proposed Activities

- ✓ Provide technical advice for the conservation awareness public awareness campaign
- ✓ Support production of badges and posters featuring the Kosrae State bird to be distributed to schools and communities



Kut mwet Kosrae u
susakin fasin, kas, a
lulalfongi lasr u...

Detail from RARE project poster.

Progress


In collaboration with other agencies, the RARE Center of Tropical Conservation and the Kosrae State Government developed a one-year public awareness campaign. The program used a variety of methods to distribute their conservation message including posters, badges, and billboards featuring Kosrae State bird, conservation education puppet show for community audience, and curriculum units and school presentations featuring a selected Kosrae State bird. Kosrae government has appointed a local counterpart whose responsibilities are project coordination and implementation with direction from Paul Butler of RARE Center. PREL contributed to education materials and bumper stickers. The Institute of Pacific Island Forestry has assisted in the support of the core funding. In early July 1999, Kosrae Governor Sigrah named the White Eye Starling (Trum) the state bird of Kosrae and promoted habitat awareness and conservation. This successful campaign was modeled after programs used in Pohnpei and Palau.

Impacts

With strong collaboration from regional resource agencies and local government, the conservation education program developed a popular approach to habitat awareness throughout the schools and communities of Kosrae. RARE has provided primary leadership and support with plans to take this successful model to other small rural island communities. This one year program has had varied long-term success in other island communities, but the cooperative nature of the program gives it a better chance to reach its lasting goals.

Cooperating Agencies: RARE Center of Tropical Conservation | Kosrae State Government | Institute of Pacific Island Forestry | Pacific Resources for Education and Learning (PREL)



University of Hawaii Sea Grant Extension Service  Pacific Program
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Operation Pathfinder Marine Science Teacher Institute

Proposed Activities

- ✓ Conduct a regional 2-week marine science teacher workshop for 20 teachers in partnership with island and regional educational agencies
- ✓ Introduce teachers to hands-on laboratory and field activities, and local resource persons that will enhance delivery of ocean and coast processes and current ocean-related issues to the classrooms
- ✓ Align workshop and training outcomes and lesson development with local curricula and individual science standards



Teachers participating in a field exercise.

Progress


Five Operation Pathfinder Institutes have been conducted in the Pacific island region since 1994. Teachers from the U.S. affiliated Pacific region, including Hawaii, have participated in workshops in Hawaii, Pohnpei (FSM), Rota (CNMI), and American Samoa. **The intensive workshop features two weeks of expert presentations and field experiences** in island rainforests and reef environments. Participants were introduced to **a variety of laboratory activities** from nationally and locally developed curricula to help interpret the concepts. Curriculum experts assisted with the transfer of information and experiences from the Institute into classroom applications. **In 1998, the workshop expanded to the 16-day COAST/Pathfinder Institute** to include more education technology and interdisciplinary curriculum integration. OIA has provided the primary project funding from 1994 to 1997. COAST/Operation Pathfinder was funded by a NOPP grant to the University of Southern Mississippi from the Office of Naval Research for 1998 and 1999. **A strong partnership with PREL** provided the Institute with a variety of resources. Partnerships with island education departments provided access to local expertise and field sites, organization of cultural events, and integrated Institute goals directly into island classrooms and teacher training.

Impacts

Teachers from Micronesia, Hawaii and American Samoa have completed the Operation Pathfinder Institute since 1994. **Teachers have started marine camps, reef survey projects, classroom reef tanks, and have encouraged other teachers to share in the projects.** College staff in Rota (CNMI), Pohnpei (FSM), and the Republic of the Marshall Islands are planning teacher trainings modeled after the Pathfinder Institute.

Cooperating Agencies: Pacific Resources for Education and Learning | Education Administrations in U.S. Affiliated Pacific Islands and Hawaii (10 entities) | Resource Agencies in U.S. Affiliated Pacific Islands and Hawaii (10 entities)



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Micronesia and American Samoa Student Internship Program

Proposed Activities

- ✓ Well trained island college students with backgrounds in environmental management and sustainable development will fill resource management positions on their home islands as a result of their participation.
- ✓ Build internship programs for Pacific island students which are designed to link them with career exploration, mentoring and professional opportunities with agencies, businesses and organizations in their home islands.
- ✓ Work with former interns to link their experience and interests with job training programs, graduate programs, and career opportunities at island agencies, businesses, and universities.



1999 MASSIP participants.

Progress

MASSIP was initiated in 1994 by the **Hawaii Sea Grant Pacific Program** and UH-Hilo with funds from OIA. It addresses a growing concern in islands about the emigration of trained islanders, or "brain-drain," especially in environmentally related fields. In six years, MASSIP has become a **successful experiential program** that gives Pacific island undergraduates the opportunity to use their academic training to work on projects affecting the environmental resources in the region. Each summer, undergraduate students from the University of Hawaii at Hilo return to their home islands to **participate in two-month internships with environment-related local organizations** and agencies. Each intern learns about local issues at home, gains valuable personal and professional experience, and is able to relate their studies to future careers through summer projects. Eleven undergraduate interns completed summer internships in 1998 and 1999. They worked on their home islands and in their area of interest with staff mentors from local agencies and organizations. Their projects include: Assessment of Public Dump Sites in Palau, American Samoa Malae Documentary Project, Use of Terminalia mangrove forests in Kosrae, Effects of Pollutants on Pelagic Fish Eggs in Palau, and Mooring buoy education and installation in Pohnpei.

Impacts

Of 46 participants from 1994-99, 28 students have graduated. Of those, five are in the process of applying for graduate school and four are in graduate school or have participated in post-undergraduate study. Fifteen former interns have returned home and are currently employed in environmentally related careers or fields.

Cooperating Agencies: COM-FSM Land Grant/CTSA | Palau Ministry of Health | American Samoa Environmental Protection Agency | American Samoa Land Grant Forestry Program | Belau National Museum | Kosrae Department of Agriculture and Land | National Park of American Samoa | USDA Natural Resources Conservation Service | Coral Reef Research Foundation | College of Micronesia-FSM Sea Grant and Pohnpei Marine Resources | Marshall Islands Marine Resources Authority | USDA Pacific Institute for Islands Forestry | UH-Hilo Student Support Service and Pacific Island Studies Program



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Pohnpei State Outer Island Environmental Education Program

Proposed Activity

Through a series of presentations by Pohnpei resource agency personnel, eighth grade students will become aware of the diversity of their island's environmental resources, and the need for conservation.



Presentation on Kapingamaringi atoll.

Progress


To build upon the successful environmental awareness program held during the spring of 1995, a 3-person interagency team from the Pohnpei Division of Marine Resources and Division of Forestry visited 19 schools on Pohnpei Island, and 6 schools on the outer islands during 1996 to make similar presentations. The program covered the importance of Pohnpei's forests and coral reefs and how communities can be involved with caring for and wisely managing them. The dynamic presentations featured lectures, games, hand-outs, and a student-run puppet show.

Impacts

The interagency environmental education program has been successful in presenting current information and issues about Pohnpei's forests and reefs to Pohnpei's public schools. Due to its success, the Pohnpei Department of Education has invited the team to continue its school presentations during 1997 and 1998. The program will be expanded this year by including additional representatives from each agency to cover new topic areas. With the approval of school administrators, the program is scheduling return visits to each school to reinforce these environmental awareness lessons. The presentations given to the outer island school were particularly appreciated by teachers, children and the community because they rarely receive this type of assistance due to their distance from Pohnpei Proper and the added travel costs.

Cooperating agencies: Pohnpei Division of Marine Resources | Pohnpei Division of Forestry | Pohnpei Department of Education



University of Hawaii Sea Grant Extension Service  Pacific Program

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Pacific Regional Aquaculture Extension Service

Proposed Activities

- ✓ Join forces with agencies and organizations involved regionally with aquaculture development to focus efforts on all aspects of developing economically viable aquaculture industries for four main groups of culture organisms (giant clams, black pearl oysters, sponges, and aquarium species), which were identified the CTSA Industry advisory council.
- ✓ Provide extension support to improve the production of those four target culture groups, including training courses on the culture techniques and general aquaculture information sessions and workshops on established and potential aquaculture species.
- ✓ Provide reliable access aquaculture information through the development of extension materials (publications, manuals and videos) throughout the region upon request



Simon Ellis,
Regional Aquaculture Extension
Specialist



Aquaculture products: sponges and giant calms

Progress

In 1996 the Hawai'i Sea Grant Extension Service joined with the Center for Tropical and Subtropical Aquaculture (CTSA), College of Micronesia Land Grant Program (COM Land Grant), College of the Marshall Islands (CMI), College of Micronesia-FSM (COM-FSM), Palau Community College (PCC) and the University of Hawai'i Pacific Business Center Program (PBCP) to form the Pacific Regional Aquaculture Extension Service (PRAES). The purpose of this group was to combine resources to improve aquaculture extension and research efforts in the region. Through coordinated programming, PRAES seeks to enhance the potential for success of aquaculture in the region by cooperatively applying as many resources as possible from agencies, governments, and non-profits throughout the region toward one single goal: the development of viable aquaculture industries. Hawai'i Sea Grant Extension, with major funding from U.S. Department of Interior Office of Insular Affairs, and other partners have linked together to make this collaborative program work. This collaborative regional extension network includes both regional and on-site positions and efforts and includes or has included the following components:

- ✓ Dr. Simon Ellis – Regional Aquaculture Extension Specialist, based at the COM Land Grant offices in Pohnpei and funded collaboratively by with CTSA. Sea Grant helped start this position in 1990 and it has grown into the important role of providing aquaculture training and technical assistance region-wide.
- ✓ Dick Croft – Regional Sponge Specialist, based in Pohnpei, worked with Sea Grant and COM-FSM Land Grant for three years, providing technical assistance, extension workshops and industry development assistance in sponge aquaculture in Palau, FSM, and the Marshall Islands (See associated sheet on Sponges).
- ✓ Anne Orcutt-Bailey – Coordinator for the Pacific Aquaculture Development Program, based in Honolulu, worked with Sea Grant for 10 years, working on various projects related to sustainable development of coastal resources. In her role as aquaculture coordinator, she provided administrative assistance and technical coordination to the research projects based in Guam, Palau, CNMI, FSM, RMI, and American Samoa.
- ✓ Mark Brotman, Aquaculture Extension Agent, based at the Northern Marianas College Land Grant Program, worked for three years on research and extension projects in the Marianas.



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- ✓ Dr. Maria Haws, Pearl Extension Specialist, based in Hilo, is currently working on developing extension and training materials for black pearl oyster farms and seed implantation technician training efforts.
- ✓ Guam Aquaculture Demonstration and Training Center, in Guam, researched several projects supported in part with funding from DOI through PRAES on mullet, shrimp, freshwater prawns, baitfish, grouper, marine ornamentals, and tilapia (and in collaboration with many, including local producers, UOG Marine Lab, and Guam Department of Agriculture).
- ✓ In 1998, Sea Grant co-funded a regional aquaculture business development specialist with UH Pacific Business Center, and College of the Marshall Islands Land Grant Program, located in Honolulu. John Sprague worked with PRAES collaborators over his year of tenure to develop financial models for pearl oyster and sponge farms and consulted with clients (private and governmental) from the Pacific Islands to assist them with their business efforts.
- ✓ The Marshall Islands Marine Resources Authority and Sea Grant supported a sustainable aquaculture/fisheries resources position in the Marshall Islands in 1999.
- ✓ Sea Grant worked extensively with both Palau and American Samoa in the development of their research, hatchery, and extension capabilities related to giant clam culture during the 1980s and 90s. Currently, Sea Grant is providing assistance to American Samoa Community College Land Grant regarding aquaculture industry development, while Palau has worked with the regional aquaculture extension and sponge specialists for on local workshops and technical assistance.



Impacts

- ✓ PRAES is becoming recognized Pacific wide as a fully integrated extension program with specific goals for commercializing the four species areas.
- ✓ PRAES receives regular inquiries about starting an aquaculture business, sources of information, operating guidelines, and permit regulations.
- ✓ Long term focus on four species will provide small companies, government agencies, university faculty, and business development specialists with the tools to succeed in bringing a species from concept to commercialization and market.
- ✓ Additional collaborators have come forth and are working with partners, such as the sponge effort at College of Micronesia-FSM and the Marine and Environmental Institute of Pohnpei to create training programs in sponge culture.
- ✓ Sponge aquaculture is becoming established in Palau and FSM, with farms seeded, technicians trained, and markets established by the private sector.
- ✓ Pearl oyster training and education materials are being published and distributed by CTSA and Sea Grant.
- ✓ Sea Grant co-hosted a successful Marine Ornamentals '99, the first international meeting on marine ornamental collection and culture.

Cooperating Agencies: Center for Tropical and Subtropical Aquaculture (CTSA) | College of Micronesia Land Grant Program (COM Land Grant) | College of the Marshall Islands (CMI) | College of Micronesia-FSM (COM-FSM) | Palau Community College (PCC) | University of Hawai'i Pacific Business Center Program (PBCP) | Guam Aquaculture Demonstration and Training Center | American Samoa Community College Land Grant Program | County of Hawai'i | Northern Marianas College Land Grant Program | Marshall Islands Marine Resources Authority (MIMRA)

Black Pearl Oyster Training Modules

Proposed Activities

- ✓ Script, film and compile footage for a video that provides an overview of the grafting procedure and a video to focus on basic components and practices important for a successful black pearl oyster farm in the tropical Pacific
- ✓ Produce accompanying training manuals



Maria Haws, Ph.D.
Aquaculture Extension Specialist



Progress


Both videos are completed and awaiting duplication and distribution. Manuals are in draft form, with expected completion in July 2000.

Impacts

These training modules will provide thorough documentation and an **in-depth instruction on the basic concepts in grafting and production of high quality pearls and pearl oyster farm management**. Best practices in grafting are described and demonstrated in detail, including the following critical steps: 1) selection of host and donor; 2) preparation of mantle tissue graft; 3) surgical procedures for insertion of nucleus and tissue graft; 4) post-grafting inspection and care; and 5) methods for improving grafting success. Techniques for avoiding common errors in grafting are also described. **This will be the first such training module on pearl oyster grafting available in the Pacific** to serve a target audience of aspiring technicians and producers. The pearl farm management module will similarly **enhance training opportunities** for practitioners in the tropical Pacific.

Cooperating Agencies: Center for Tropical and Subtropical Aquaculture | County of Hawaii



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Commercial Sponge Aquaculture Extension Training

Proposed Activities

- ✓ In effort to establish a commercial sponge farming industry throughout Micronesia this program provided extension assistance to existing and new sponge farms and researches improved methods of sponge farming.
- ✓ Transfer sponge culture production methods to farms in the FSM, RMI, and Republic of Palau, through on-island workshops in the region and surveys of locally available wild stock.
- ✓ Assist with the expansion of existing commercial sponge farms by providing them with additional training programs and cuttings and planting supplies.



Divers at work on a Pohnpei sponge farm.



Dick Croft
Pacific Regional Aquaculture
Extension Specialist

Progress


Training sessions were held and two farms were started in the Kitti municipality of Pohnpei. Each farm now has approximately 800 sponge cuttings planted. Marine Environmental Research Institute of Pohnpei (MERIP) assisted in obtaining wild sponges and set up two sponge farms. In 1999 four sponge farming workshops were held on Pohnpei, resulting in three new sponge farms. Workshops in 1998 and 1999 in Chuuk resulted in 600 sponge cuttings planted in a government-owned demonstration farm. Seven sponge farming workshops were held in Palau during two visits and two new farms were established, bringing the total to six. With assistance from the extension agent and his assistant, Pohnpeian sponge farmers produced and sold approximately 6,000 commercial in 1999 and 10,000 will be sold in 2000. Continued assistance continue, will allow production to double by the end of 2001. Four growth experiments were completed on another potential sponge, *Spongia matamata* under various conditions. Wild wool sponge surveys were conducted in Jaluit, RMI.

Impacts

Presently there are eight privately owned/operated sponge farms in Pohnpei and six in Palau. Three of the Pohnpei farms are currently exporting sponges. The others should be in a position to start marketing sponges by the end of 2001. Pohnpei Natural Products (PNP), a Pohnpei-based company, signed an agreement in 1997 with a London-based company to export up to 70,000 cultured sponges per year from. Regional and international presentations on sponge culture in the Pacific has promoted the region as one of the only places world-wide where sponges are cultured commercially.

Cooperating Agencies: Hawaii/Pacific Sea Grant Extension Service | College of Micronesia Land Grant | Center for Tropical and Subtropical Aquaculture | South Pacific Commission | UNDP Aquaculture Program



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Enewetak and Ujae Atoll Canoe Construction Documentation

Proposed Activity

Document and publish traditional voyaging canoe building techniques from the residents of Ujae and Enewetak Atolls in the Republic of the Marshall Islands



Traditional Marshallese canoe.

Progress

The **Enewetak canoe book** is the seventh phase of the Waan Aelon Kein (Canoes of the Islands) project. Traditional methods of canoe building were documented, and differences noted between other atoll canoe builders. **Eight expert Enewetak canoe builders and over 30 other Enewetak men, ranging in age from 10-70,** participated in construction. A 50 foot ocean voyaging canoe and a smaller 15 foot canoe were built. The 50 foot canoe sailed and **participated in the 1992 Festival of Pacific Arts VI in Rarotonga, Cook Islands,** where it was considered the fastest traditional craft in the Pacific.

The Ujae canoe book marks the eighth phase of the project. Expert Ujae canoe builders and more than two dozen Ujae men participated in this project. "Laninmantol," **a book documenting Ujae sailing canoe construction techniques,** is being ready for publication in summer of 2000, pending availability of funds.

Impacts

Marshallese were some of the most experienced and skilled **outrigger canoe builders and navigators** in the western Pacific region. While the modern outboard-powered boat addresses the desire for greater speed, economically, the traditional outrigger canoe, because it does not consume expensive fuel, is better suited to the economic conditions in remote atoll subsistence communities. The documentation process and actual construction of canoes, all individual to each atoll, has **rekindled Marshallese pride** in the traditional skills and philosophy of the voyaging canoe.

Cooperating Agencies: Ujae Atoll Local Council | Enewetak Atoll Local Council | L.J. and Mary Skaggs Foundation, Oakland California | Job Training Partnership Act. | Alele Museum | Airline of the Marshall Islands | Pacific International Incorporated | Courtaulids Coastings (New Zealand) Ltd. | Youth to Youth in Health | Robert Reimers Inc. | Republic of the Marshall Islands Government | Marimed Foundation | Northwest School of Wooden Boatbuilding | Australian South Pacific Cultures Fund | Australian Embassy Discretionary Fund | Marshall Islands Marine Resource Authority | Republic of the Marshall Islands Government |



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A Prototype Aquaculture Work-Boat

Proposed Activities

- ✓ A prototype outrigger sailing canoe will be constructed and tested as a work platform for the RMI black pearl oyster aquaculture industry
- ✓ At least four interns supported by JTPA will be trained by Waan Aelon in Majel canoe program during this project adding to the local skilled work force of boat builders in RMI



Work-boat construction shed on Majuro.

Progress

The regional aquaculture extension agent contracted The Waan Aelon In Majel Canoe Program to construct a modified Marshallese-style outrigger sailing canoe, which can serve as a useful work platform for RMI pearl oyster farmers. Direct shipment of materials has been delayed, but the materials will be re-routed through Hawaii so that progress will stay as close to schedule. It is still anticipated that JTPA will support trainees to learn how to build canoes. The canoe will serve as a prototype to demonstrate its usefulness for RMI the pearl farms.

Impacts

High initial operating expenses costs, such as the purchase of a motor boat, has hindered the expansion of the RMI black pearl industry. Outrigger canoes modified to accommodate a work platform will cost half as much as a motor boat, which can cost more than \$10,000. In addition, this project may encourage the development of a boat building cottage industry. Such an industry could provide outrigger canoes and boats of different designs for subsistence fishing, charter vessels for the developing tourist industry, and as aquaculture work platforms for the black pearl oyster industry. Finally, the project will instill cultural pride and increase the number of outrigger canoes in use, as a practical and inexpensive transportation option, insuring that this unique and vibrant aspect of Marshallese culture is not lost during a time of rapid westernization.

Cooperating Agencies: Waan Aelon in Majel (Canoes of the Marshall Islands) Program | RMI Joint training Partnership Act (JTPA)



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CMI Reef Flat Resource Assessment Surveys

Proposed Activities

- ✓ College of the Marshall Islands (CMI) marine science students and faculty survey lagoon reefs for mollusc populations on Majuro Atoll as part of a long-term effort to identify changes that occur due to different exploitation practices
- ✓ CMI students gain hands-on experience by planning sampling, conducting field studies, analyzing data, and writing reports



Progress

College of the Marshall Islands (CMI) marine science program has begun an **extensive survey of lagoon reefs for mollusk populations on Majuro Atoll** as part of a long-term effort to identify changes that occur due to different exploitation practices. They will undertake studies to understand population dynamics of the common species of reef flat cowries. These molluscs are used to make traditional handicrafts, which are now produced for the tourist trade and to export. **This project is the result of a written request from Iroj (Chief) Mike Kabua and the RMI Council of Majors.** The results of the survey are expected to be available by mid-summer.

Impacts

CMI students **gain hands-on experience** at conducting field studies, including planning of the sampling plan, conducting the field study, data analysis, and report writing. The surveys of lagoon reef populations and structure provide a long-term monitoring record to provide background information on trends in community structure and to form a baseline for any impact analyses relating to the development plans that might be proposed. The studies of reef flat cowries populations will provide the kinds of **information** on their population densities and dynamics **needed to develop a management plan for the sustainable exploitation** of the resource important to traditional craft production for sale to tourists and for export.

Cooperating Agencies: RMI Environmental Protection Agency | MALGOV | College of the Marshall Islands | Kosrae State Development Review Commission | FSM Dept. of Economic Affairs | CNMI Coastal Resources Management Office



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Regional Coastal Ecosystem and Resource Management Program

Proposed Activities

- ✓ Develop ecologically sustainable methods of coastal resource use based on a better understanding of impacts on marine and terrestrial ecosystems
- ✓ Establish a regional program to identify and address coastal hazards and hotspots in the region.
- ✓ Assist in a public awareness campaign of coastal hazards and planning and response options.
- ✓ Provide technical advice and assistance to policy makers, planners, coastal zone managers, and beach front property owners.



Robert Mullane
Maui County/Sea Grant Regional
Coastal Processes Agent

Peter Rappa
Coastal Resource Management
Extension Agent



Progress


In June of 1999, Hawaii/Pacific Sea Grant organized three, two-day workshops on coastal processes, held in Majuro, Kosrae, and Saipan. The 57 attendees learned about processes such as erosion and accretion, sea-level rise, and sediment transport, and discussed human activities that influence coastal processes. Hawaii/Pacific Sea Grant also assisted the Kosrae government in the publication of six educational posters to increase public awareness of coastal hazards and assist in voluntary compliance with hazard mitigation. The Resource Management Program trained five coastal planners from the American Samoa CMP and Kosrae Island RMP programs in environmental impact assessment and enforcement techniques. The three planners trained in 1999 and the two trained in 1998 are better able to identify the impacts on coastal resources of development projects located near the coast. This September, a planner from the Commonwealth of the Northern Mariana Islands (CNMI) will participate in training, contingent on funding.

Impacts

State and federal agency staff increased their understanding of coastal processes, enabling them to more effectively anticipate and mitigate impacts of certain shoreline activities. In Saipan, coastal resource managers developed a better management plan for Managaha Island. The residents of Kosrae now have a more complete understanding of coastal processes, which will support the Development Review Commission's future regulatory actions. The ASCMP Program Manager reports that the planners who participated in the Pacific Sea Grant training have vastly improved their performance.

Cooperating Agencies: U.S. Geological Survey | SOPAC | RMI Environmental Protection Authority (RMI EPA) | College of the Marshall Islands | FSM Office of Economic Affairs | CNMI Coastal Resource Management Program | American Samoa Coastal Management Program (ASCMP) | Department of Planning and Permitting (City and County of Honolulu) | Department of Planning (County of Hawaii) | Kosrae Island Resource Management Program (KIRMP)



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FSM Coastal Resources Management Extension Program

Proposed Activities

- ✓ Provide technical assistance for coastal development projects in the FSM States.
- ✓ Initiate and organize environmental education programs for community groups and schools in the FSM States.
- ✓ Provide on-island technical and logistical contact for Sea Grant activities and projects, and those of its cooperating partners as requested.



Ahser Edward,
COM-FSM Extension Agent

Progress

Since 1988, the FSM Sea Grant Extension Program, cooperatively supported by the College of Micronesia-FSM (COM-FSM) and Hawaii Sea Grant, has **successfully conducted a variety of projects and training activities** aimed at building local capacity and self sufficiency. Selected project accomplishments completed by the COM-FSM/Sea Grant Extension Agent include the following:


- ✓ **Coordinated a series of community meetings** for the Pohnpei State Coastal Resource Management Plan and other resource planning meetings involving the communities, agencies, and interested individuals
- ✓ Coordinated and **developed internship opportunities** for undergraduate students at UH and COM-FSM
- ✓ Coordinated and **conducted coral reef monitoring** surveys and training throughout FSM
- ✓ Coordinated and conducted numerous interagency projects on **environmental impact assessment** and mitigation, reef baseline surveys, and other resource management research.
- ✓ Conducted numerous outreach presentations and workshops on **locally important coastal conservation and marine issues** throughout the FSM.

Impacts

The FSM extension program is **an important facet of the overall Hawaii Sea Grant Pacific Program's extension network**. The FSM extension agent has helped island communities identify sustainable development needs, facilitated shared resources of different agencies and organizations to address these needs, and served as an on-island technical information source. The cooperative nature of this position strengthens important links with island agencies with similar mandates and places our extension agent in a unique position to facilitate environmentally sustainable activities.

Cooperating Agencies: College of Micronesia-FSM | Pohnpei State Resources and Conservation Surveillance | The Nature Conservancy - Pohnpei Field Office | South Pacific Region Environmental Programme | Attorney General's Office, Pohnpei State | Environmental Protection Agency, Pohnpei State | Joy Hotel Tour Agency | University of Guam | FSM Transportation Authority | Pacific Missionary Aviation | Micronesian Seminar | University of Hawaii at Hilo



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Coastal Resource Management Partnership in American Samoa

Proposed Activities

- ✓ Provide technical assistance for review of coastal development projects in American Samoa.
- ✓ Provide an on-island technical and logistical contact for Sea Grant activities and projects.



Nancy Daschbach
Fagatele Bay National Marine
Sanctuary Coordinator

Progress

Since 1990, Nancy Daschbach, Manager of the Fagatele Bay National Marine Sanctuary Program (NMSP) in American Samoa, has acted as the Sea Grant counterpart for projects conducted in American Samoa. In this capacity, Nancy has served as both an advisor and participant in our activities. In many cases, the Fagatele Bay NMSP has provided matching funds and logistical support for these projects. Sea Grant's unique partnership with the Fagatele Bay NMSP has allowed the program to service the needs of American Samoa when it may have otherwise been unable to since there is currently no full time extension agent based there. Selected accomplishments completed in American Samoa by the Pacific Program include:


- ✓ Coordinated the printing and distribution of "Year of the Reef" coloring books to all 5th to 8th grade American Samoa students. The coloring book was printed in Samoa, Hawaiian, and English languages.
- ✓ Assisted agencies with developing internship opportunities for the Micronesia and American Samoa Student Internship Program.
- ✓ Assisted with the selection of trainees to participate in the American Samoa Compliance Training Program and regional workshops
- ✓ Served as an on-island liaison for the UH Department of Urban and Regional Planning students completing the American Samoa village planning project practicum.
- ✓ Developed and participated in a coastal resource management counterpart training workshop in Honolulu.

Impacts

Although there is currently no full time extension agent is based in American Samoa, significant coastal resource management contributions have been achieved with the assistance of the Fagatele Bay NMSP. This coming year, it is anticipated this relationship will be re-evaluated with the Fagatele Bay NMSP, American Samoa Economic Development and Planning Office, Department of Marine and Wildlife, and the American Samoa Community College, to determine whether a full-time extension agent position is needed for American Samoa.

Cooperating Agencies: Fagatele Bay National Marine Sanctuary Program, American Samoa Economic Development and Planning Office. | American Samoa Department of Marine and Wildlife Resources. | Coastal Resources Office, American Samoa Economic Development and Planning Office



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Coastal Processes Workshop Series

Proposed Activity

Organize and conduct a series of 2-day workshops on coastal erosion management in the Micronesia region to increase professional awareness of coastal processes and promote sound management of coastal development.



Workshop participants learn about coastal processes.

Progress

In June 1999, a total of 57 agency representatives, policy-makers, educators, community-leaders, and other members of the public attended 2-day workshops conducted in Majuro, RMI; Kosrae, FSM; and Saipan, CNMI. The education and training covered coastal processes topics such as erosion and accretion, sea-level rise, and sediment transport, with in-depth discussions about human activities that influence coastal processes. Specific recommendations for enhanced management of coastal zone activities were also presented. Each workshop included a half-day field trip to local erosion hotspots to better illustrate concepts presented. In Majuro, Dr. Bruce Richmond from the U.S. Geological Survey and COM-FSM Sea Grant agent Ahser Edward were interviewed for a public television documentary on sea-level rise. A resolution recommending specific actions to enhance management of coastal resources was produced in Kosrae by workshop participants. The proceedings is in preparation and will be published and distributed to workshop attendees.

Impacts

These workshops provided **relevant and necessary training in coastal processes** to agency personnel and policy makers. Participants are now more qualified to monitor and minimize environmental degradation and establish more effective guidelines for shoreline activities. As a result of the workshop, the Coastal Resource Management office in Saipan, decided to halt the construction of coastal armoring on Managaha Island and instead preserve the island in its pristine state.

Cooperating Agencies: RMI Environmental Protection Agency | MALGOV | College of the Marshall Islands | Kosrae State Development Review Commission | FSM Dept. of Economic Affairs | CNMI Coastal Resources Management Office | U.S. Geological Survey | SOPAC | College of Micronesia - FSM



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Pacific Island CZM Compliance Training

Proposed Activity

Conduct annual three-week training sessions in project review and permit compliance



Workshop participants at the Environmental Center.

Progress


Each year from 1994 to 1998 island trainees have participated in this training program. Each annual session consists of two weeks of classroom and field work at the University of Hawaii Environmental Center. Participants then spend a week at a county planning office learning about compliance enforcement. Nine Compliance Review Officers have successfully completed the program. The highlight of the training program for the trainees was the chance to work with planners from the City and County of Honolulu and the County of Hawaii Planning Offices. It showed the trainees that planners from Hawaii face many similar problems. Moreover, the trainees were able to get ideas on how to approach developers who do not follow CRM policy on their home island.

Impacts

A self-evaluation completed by the trainees revealed that all found the training useful. Evaluation by the CRM Managers confirmed that the program was very useful and the trainees have shown great improvement in their jobs on their home islands.

Cooperating Agencies: American Samoa Coastal Zone Management Office | UH Environmental Center | City and County of Honolulu | County of Hawaii



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Kosrae Coastal Processes Posters

Proposed Activity

Assist with the development and printing of a series of posters to improve public awareness of coastal processes and promote the wiser use of coastal resources.

Progress

The Kosrae State Development Review Commission developed a series of six posters on coastal hazard topics as an effective way to increase public awareness on coastal processes and hazards and drafted six educational posters discussing various topics. The posters explained some of the causes of coastal erosion and beach loss on Kosrae and suggested ways to reduce human-induced erosion. The Pacific Program assisted with the development and review of these posters. The color posters were printed in both English and Kosraean at the Hawaii Sea Grant Pacific Program office. They were posted around Kosrae and distributed to developers, land owners and island schools. Topics covered by the posters are: coastal defenses can increase coastal erosion (shown here), coastal erosion and coastal development; typhoons and tidal waves on Kosrae; coral reef and coastal erosion; sand mining causes coastal erosion; and, vegetation helps slow down coastal erosion.

Impacts

These posters will help educate the public about coastal erosion and other coastal hazards (e.g., typhoons and tsunamis). They will also promote effective shoreline building setbacks, protect natural erosion buffers (shoreline vegetation and the coral reef), and discourage those shoreline activities that aggravate coastal erosion (e.g., sand mining).

Cooperating Agencies: Kosrae State Development Review Commission

Seawall ku oiyac ma sang kosralla we acn uh ku in akyokye mongolac lun we acn uh



Sea wall ku kutena oiyac ma kut orekmakin in sang kosralla lihk ku we acn lasr, suc ma tia lumeyukla ku planiuki wo ku in akyokye ku ak-muiye pa mongolac lun we acn uh.


Sea wall ma srik cost ka tia ku in kosralla wo acn lasr ku ma lasr ma oan fototo nu we kof uh liki mongola lun we acn uh ke pal eng upa.

Kom ac fin elya ke mongola lun we acn uh in ak-kolukye ma lom ku acn lom an – osun nu sin DRG meet liki kom musai sea wall



Fin oasr siyuk sukosok in suk ku pangon Development Review Commission fin acn Tofol ke telephone number 370-2076.



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Pohnpei Mooring Buoy Project

Proposed Activities

- ✓ Deploy mooring buoys on the reefs surrounding Pohnpei in order to protect them from anchor damage by dive boats, fishermen and other recreational boaters.
- ✓ Create a collaborative team to educate the people of Pohnpei about mooring buoys and gain their support of the project, and the Mooring Buoy Installation team to install the buoys on the outer reef slope
- ✓ Conduct a community education program with assistance from a MASSIP intern, including community meeting around the island of Pohnpei to educate about the project and get input from the community on desired locations for the buoys
- ✓ Develop educational materials including pamphlets, t-shirts, stickers, hats, billboards, and banners



Progress

The mooring buoy installation program was implemented in two phases – community education, and deployment of buoys around Pohnpei proper. A MASSIP student assisted in the development and production of t-shirts, bumper stickers, hats, a brochure and a radio program. **Ahser Edward, the COM-FSM Sea Grant Extension Agent**, Pohnpei Marine Resources, and the FSM National Marine Resources office coordinated over 30 community meetings during the course of the education component. They also installed the buoys from late July, to September, 1999 with the assistance of local hotels and dive shops. The project was completed with 100 buoys installed around the main island of Pohnpei and the two nearby outer islands.

Impacts

- ✓ **People are no longer throwing anchors on the reef.** The buoys are being heavily used by both tour operators and local fishermen.
- ✓ People are more aware now that **it is important to protect the coral reefs.** Many communities were visited during the project and many expressed their appreciation once they learn why the buoys are being deployed.
- ✓ **Cooperators held education meetings in more than 30 communities** and the opportunity for input was well-received.

Cooperating agencies: Pohnpei Marine Resources Division | Tour Agencies | Village Hotel | Joy Hotel | Misko Beach | Municipalities of Madolenihmw, Sokehs and Nett



University of Hawaii Sea Grant Extension Service Pacific Program
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Proposed Activities

- ✓ Work with other regional technical organizations to help the Pohnpei State Environmental Protection Agency to develop a regionally applicable methodology for monitoring and restoring dredge sites
- ✓ Conduct biological and physical surveys of dredge sites around the main island of Pohnpei
- ✓ Determine alternative sources of construction material
- ✓ Assist SOPAC in studying impacts of sand mining practices occurring on Pohnpei's barrier islands
- ✓ Develop new regulations and recommendations for the control of dredging and sandmining in Pohnpei State



Progress


The South Pacific Applied Geosciences Commission (SOPAC) coordinated a **three-part survey to assist Pohnpei State to develop new dredging regulations**. A team of scientists from Sea Grant/University of Hawaii, Hilo conducted a marine biological survey in September 1997. SOPAC and SPREP carried out physical oceanography and economic studies in 1998. SOPAC completed and published a technical report from the Pohnpei Coral Reef Dredging Project, assisted by COM-FSM Sea Grant and Pohnpei EPA, in 1997. **This study researched the biological and physical conditions of the many dredge sites** around the main island of Pohnpei, made recommendations about how these pits can be better utilized by the government, investigated the idea of banning the extraction of coral materials from the coastal areas, and suggested alternatives to this source for building materials. In 1998 a SOPAC follow-up study examined the extent and practice of sand mining in Pohnpei. It also investigated **the effects of sand mining on the barrier reef** and recommended better sites for this purpose around the island. **The COM-FSM Sea Grant Extension Agent, Ahser Edward**, assisted both of these projects and wrote a report to the Pohnpei Legislature in 1999 emphasizing the recommendations.

Impacts

The methodology employed by SOPAC and Sea Grant was deemed to be successful, which could help launch other similar studies in the insular Pacific. Recommendations to the Legislature are still pending. It would be significant if as a result, guidelines are developed and adopted that would make dredging less destructive to the surrounding area.

Cooperating agencies: South Pacific Applied Geosciences Commission | South Pacific Regional Environmental Programme | University of Hawaii at Hilo | Pohnpei State Environmental Protection Agency | College of Micronesia, Federated States of Micronesia



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