

PROCEEDINGS OF THE  
2004 ROUNDTABLE OF  
FEDERAL HAZARD MITIGATION PARTNERS  
IN THE PACIFIC ISLANDS

*E lauhoe mai na wa`a, pae aku i ka`aina.*

If everyone paddles the canoe, the shore is reached.

NOAA PACIFIC SERVICES CENTER

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HONOLULU, HAWAII

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## 1. MEETING OVERVIEW

### 1.1. Background

The first Roundtable of Federal Hazard Mitigation Partners in the Pacific Islands (FHMPPI) was held in Honolulu, Hawai'i, on March 11 and 12, 2003. This meeting brought together representatives from agencies, institutions, and organizations in the Pacific involved in hazard-related projects and activities conducted at the federal level. The purpose of this meeting was to explore opportunities to enhance communication, coordination, and collaboration among the federal *ʻohana*, or family, of hazard mitigation partners. Among the priority action items identified by the participants at the 2003 FHMPPI was a call for a second meeting.

In response to this request, the National Oceanic and Atmospheric Administration (NOAA) Pacific Services Center (PSC) convened the second Roundtable of Federal Hazard Mitigation Partners in the Pacific Islands on March 16 to 18, 2004, in Honolulu, Hawai'i. Ninety registered participants attended the 2004 FHMPPI (up from 55 in 2003). Local, national, and regional agencies, institutions, and organizations involved in risk management-related programs and activities in attendance included the National Oceanic and Atmospheric Administration (NOAA), Federal Emergency Management Agency (FEMA), U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), U.S. Geological Survey (USGS), U.S. Coast Guard, State of Hawai'i, Territory of American Samoa, South Pacific Applied Geoscience Commission (SOPAC), South Pacific Regional Environmental Programme (SPREP), Pacific Resources for Education and Learning (PREL), International Tsunami Information Center (ITIC), Pacific Basin Development Council (PBDC), American Red Cross, and the governments of New Zealand, Australia, Chuuk, and French Polynesia.

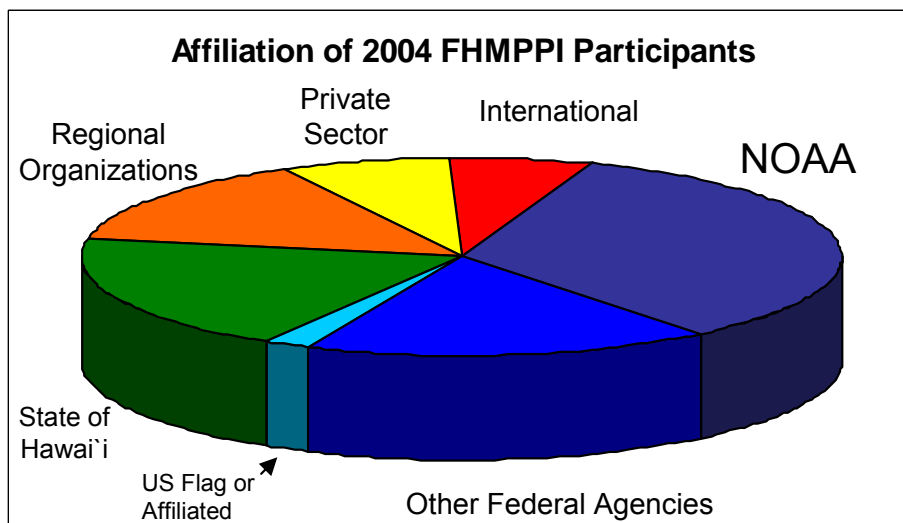


Figure 1. Pie Diagram Illustrating the Affiliation of Participants at the 2004 FHMPPI

## 1.2. Objectives

Consistent with the objectives of the 2003 roundtable, the overall objective of the 2004 FHMPPI meeting was to sustain and expand upon the dialogue started at last year's meeting. Specific objectives for the 2004 roundtable included the following:

- ◆ Cultivating a sense of community and an appreciation for the unique physical and cultural characteristics of the Pacific Islands;
- ◆ Expanding the community as a means to increase the awareness of a regional perspective and enhance opportunities for collaboration;
- ◆ Updating participants on the status of agency, institution, or organization hazard mitigation projects and activities being conducted in the Pacific Islands;
- ◆ Reviewing the outcomes of the 2003 FHMPPI meeting for the purpose of revising and refining the embryonic action plan.
- ◆ Activating several working groups, or *hui o hana*; and
- ◆ Establishing a regional coordinating council.

## 1.3. Accomplishments

At the 2004 roundtable, information about a wide range of partner agencies, their programs and initiatives, and their projects and activities was shared, and opportunities for collaboration were explored. In this way the unique challenges and opportunities of working in the Pacific, given issues of geography, culture, politics, and risks, were illuminated. Some specific accomplishments of the 2004 FHMPPI include the following:

- ◆ Activation of working groups, or *hui o hana*, in the following areas: Coastal, Ocean, and Atmospheric Processes and Observations; Data Management; Data Analysis and Decision-Support Tools; Communications Infrastructure and Information Dissemination; Post-Disaster Evaluation and Performance Indicators; Education, Outreach and Training; and Traditional Knowledge and Practices.
- ◆ Identification of a specific set of actions (e.g., workshops, inventories, and mechanisms for sustained dialogue) to be carried out by each *hui* over the next 12 months and intended to enhance the delivery and development of risk management–related information, products, and services.
- ◆ Creation of a “canoes/paddles” conceptual framework for interagency communication, coordination, and collaboration among federal partners, as well as other agencies, institutions, and organizations, as a means to address issues of local, national, and regional concern, and that will serve as the basis for development of a joint regional action plan over the next 12 months.
- ◆ Formation of an interim coordinating council composed of two members from each *hui* and tasked with developing a draft joint regional action plan and coordinating council policies and procedures over the next 12 months.
- ◆ Agreement to convene again in 2005.

## 2. CONNECTING WITH THE NEEDS OF END USERS: LESSONS LEARNED

### 2.1. Panel Presentations

Presentations were made by end users who have been directly impacted by natural hazards. Discussions centered on three main questions:

1. *What was the impact of the hazard?*
2. *From the perspective of different use sectors, what products and services were valuable and what were missing?*
3. *What was the most prevalent need?*

The end-user panel was made up of the following individuals:

- ◆ Chip Guard, NOAA National Weather Service (NWS) Guam Forecast Office
- ◆ Andra Samoa, American Samoa Government (ASG) Distance Education, Learning and Telehealth Applications (DELTA) Consortium
- ◆ Eddie Bernard, NOAA Pacific Marine Environmental Laboratory
- ◆ Brian Yanagi, Hawai'i State Civil Defense
- ◆ Larry Kanda, Hawai'i State Civil Defense

The majority of the discussion focused on the question, "*From the perspective of different use sectors, what products and services were valuable and what were missing?*" Live recording captured the following statements.

- Explain your scientific fields in a way that people can understand; translate into the local language because English is still a second language in most remote communities
- Feedback from the users is warranted
- Historical information and getting people to think about what has happened in the past
- Education and the importance of visualization
- Sharing of resources is warranted
- Piggyback on existing communications structure
- Well-educated and well-trained people in place so they can respond in a timely and effective manner
- Better risk assessment (tighter working partnerships) – knowing and understanding these models to prepare for hazards
- Move people from awareness to change of attitudes and actions using a variety of tools and approaches
- Invest in the operation and preventive maintenance of equipment
- Improve infrastructure to support communication and coordinated response
- Better inventories are warranted
- Means of shifting political will
- Translate models to the homeowner (If you have a home without mitigation measures, your losses are likely to be higher in terms of dollars)



- Use models as simulation tools
- Create models capable of reacting in (near) real time
- Customize models and market them for local community/sector needs by audience industry (e.g., construction) and region
- Economic incentives to stimulate people to take responsibility for mitigation measures
- Recovery planning by states to accelerate construction industry availability and needed supplies

## 2.2. Questions and Answers

Specific questions and answers directed at individual panelists are outlined below.

**Table 1. Question and Answer Period with End User Panelists**

Panelist/Question	Answer
<p><b>Chip Guard</b></p> <p>1. Re: burden for reporting—What would be useful—the 3 to 5 level intensity scale?</p>	<p>Now using a 3 level intensity scale. The 3 tier level is working pretty well, but it's not a continuum.</p>
<p>2. Re: actual application of the forecast—How do you make scientific output understandable to local people? El Niño has different definitions, e.g., different in New Zealand and Australia.</p>	<p>There is going to be a lag between the northern and southern hemispheres. The El Niño Southern Oscillation (ENSO) newsletter has a one-page summary at the bottom of newsletter.</p> <p>Conducted two and a half years of workshops to get people to think about what they would do if they knew what might happen. Two and a half years of thinking it through allowed people to work through political problems; the attitude is spreading across Micronesia.</p>
<p><b>Andra Samoa</b></p> <p>1. Are there any plans to conduct a cost-benefit exercise between Heta and other events?</p>	<p>DELTA Consortium member agencies share fees to access the satellite and local fiber network. Cost sharing is beneficial, but also, all agencies should be encouraged to use the infrastructure already in place.</p>

**Table 1. Question and Answer Period with End User Panelists (cont'd)**

<b>Panelist/Question</b>	<b>Answer</b>
<p><b>Eddie Bernard</b></p> <p>1. How did the commitment to rebuild and will of the government come about?</p>	<p>The council recommended actions and showed an animation to demonstrate the effects. The tool guided the recovery effort. In California, even when you identify potentially hazardous areas, people are not always willing to accept it. Our society will not use seawalls, so that only leaves land-use management; however, there are other alternatives, e.g., tsunami forests in Japan. In Northern California, there are some instances where that could work.</p>
<p>2. In the case of local tsunamis or instances with no historical evidence, what do you do?</p>	<p>Take advantage of media coverage and keep replaying it. Visual media is so intense and we can use it. People can learn.</p>
<p>3. In the western Pacific, there is no history of distant tsunamis. There is the general feeling that because of the reef and depth of the oceans, is it probably difficult for tsunamis to affect these islands. Are the physics there to support that?</p>	<p>Tsunamis can be generated in different ways—via meteors, exploding volcanoes, earthquakes, the Marianas trench, etc. For Guam, there is no evidence, but probability is unknown for other islands. In order to save lives, education is a powerful means.</p>
<p><b>Brian Yanagi</b></p> <p>1. Does the state plan for the construction side of recovery and supplies?</p>	<p>Yes, the state does assist. The state needs to think in the long term. Iniki took an excessively long time for recovery. It is important to take these models and go to the state/counties governments and convince them.</p>
<p><b>Larry Kanda</b></p> <p>1. When you looked at the threat to Kaua`i and the Big Island, was that stratified?</p>	<p>Each island is exposed. For estimated losses, average annualized losses. In Hawai`i, historic data are far less robust; records only exist for about the past 30 years.</p>

## 3. REGIONAL PROGRAMS AND INITIATIVES

### 3.1. Reports from Federal Agencies

#### 3.1.1. Panel Presentations

Presentations were made by representatives from federal organizations involved in risk management within the region. The session allowed the group to learn about programs and initiatives that are relevant to the region and explore opportunities to enhance regional coordination.

Presenters:

- ◆ Mary Glackin, Assistant Administrator, NOAA Office of Program Planning and Integration
- ◆ Sally Ziolkowski, Director of Federal Insurance and Mitigation Division, FEMA Region IX
- ◆ Ed Young, Deputy Director, NOAA NWS Pacific Region Headquarters (PRH)
- ◆ Jill Meyer for David Kennedy, Director, NOAA Office of Response and Restoration (OR&R)
- ◆ John McCarroll, Manager, Pacific Islands Office EPA
- ◆ John Gambel, National Hurricane Program Manager, FEMA
- ◆ Alan Mikuni, Regional Geographer, Western Region USGS
- ◆ Stan Boc, Engineering Research and Development Center USACE

#### 3.1.2. Reflection Sheets

Participants were asked to complete reflection sheets to comment on two questions for each panelist. The questions were:

- *What efforts are you involved in that are similar?*
- *What opportunities do you see for enhanced coordination?*

Tables 2 and 3 list responses to these questions.

**Table 2. Similar Efforts with Federal Agencies**

<b>Panelist/Remarks</b>	
<b>Mary Glackin</b>	
<ul style="list-style-type: none"> <li>• Global communication links</li> <li>• Sea level data management – global climate change</li> <li>• Surf forecasting – weather &amp; water</li> <li>• Global environmental, process and change research program</li> <li>• Global observing systems (e.g., Argo)</li> <li>• Climate variability and change</li> <li>• Ozone program</li> <li>• Ocean program</li> <li>• Working closely with NOAA in communicating information to and from remote communities</li> <li>• Regional coordination of environmental observations and dissemination of potential impacts</li> </ul>	<ul style="list-style-type: none"> <li>• SOPAC approach is a total ocean-island systems management. Its community risk program is also from a comprehensive, integrative risk management</li> <li>• SOPAC is developing Environmental Vulnerability Index</li> <li>• ASG Delta/ASPA involved in planning and implementation of programs to effectively use the public service telecom infrastructure for the public interest</li> <li>• Outreach &amp; education on natural hazards in Pacific region</li> <li>• Making communities storm-ready, tsunami-ready</li> <li>• Development of tools and products for end users</li> </ul>
<b>Sally Ziolkowski</b>	
<ul style="list-style-type: none"> <li>• Internet-based hazard information sharing</li> <li>• Flood map upgrade – shoreline change integration vs. tidal change</li> <li>• Collection of Light Detection and Ranging (LIDAR) data</li> <li>• Natural Hazards Centre (NHC)</li> <li>• Products &amp; tools (e.g., Geonet, wave climate, flood maps, Information Coordination Unit (ICU), Tropical Cyclone Update (TCU), etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Coastal hazard assessment Working with FEMA to re-map areas that have recently been damaged</li> <li>• Not to the same scale of funding, but hazard mapping is an ingredient</li> <li>• Continue hardening of infrastructure from overhead transmission and distribution to underground</li> </ul>
<b>Ed Young</b>	
<ul style="list-style-type: none"> <li>• Better communication in Pacific area</li> <li>• Dissemination of information on short notice</li> <li>• Disseminating information to remote communities</li> <li>• Working closely with PRH to develop reliable and sustainable communication systems to reach the last mile</li> <li>• Working directly with NWS in communications to islands via methods Ed mentioned</li> </ul>	<ul style="list-style-type: none"> <li>• Pan-Pacific Education and Communication Experiments by Satellite (PEACESAT)/Telecommunications and Information Policy Group (TIP-G)/State Telehealth Access Network (STAN) connection to Pacific Islands to provide technical assistance and Telehealth opportunities to remote islands of the Pacific</li> <li>• Searching for more effective communication methods; how to reach people in remote communities</li> </ul>

**Table 2. Similar Efforts with Federal Agencies (cont'd)**

<b>Panelist/Remarks</b>	
<b>Ed Young (cont'd.)</b>	
<ul style="list-style-type: none"> <li>• Secure climate data from each Pacific island country each month for preparation of the Island Climate Update</li> <li>• Strengthen links to SPIs</li> <li>• Communication underpins whole-of-country risk management approach</li> </ul>	<ul style="list-style-type: none"> <li>• Initiative to start on developing national-level communication development plans driven from both user needs and appropriate technology</li> <li>• Telecommunication coordination and sharing resources with other partners—federal, state, and local agencies</li> </ul>
<b>Jill Meyer</b>	
<ul style="list-style-type: none"> <li>• Dispersal and trajectory modeling</li> <li>• Risk and vulnerability assessment tools and on a larger scale, geographic information system (GIS) decision-support tools</li> <li>• Hazard assessment and mitigation</li> <li>• Human-induced impact assessment and response</li> <li>• Education and outreach in the form of distance learning</li> <li>• East-West Center Environmental Studies</li> <li>• Use similar methods but ours are education-focused: data management, education and training, traditional knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Training in U.S. Flag Pacific Islands</li> <li>• Technical assistance on hazard response and damage assessment</li> <li>• Decision-making tools (e.g., flood maps, windpower maps)</li> <li>• National centers to disseminate tools &amp; products (e.g., Natural Hazards Centre)</li> <li>• Development of geologic maps with some of the same ends</li> <li>• Capacity building and empowerment of users/community</li> <li>• Effective response to any technical difficulties experienced by any member agency using the DELTA/ American Samoa Power Agency (ASPA) network</li> </ul>
<b>John McCarroll</b>	
<ul style="list-style-type: none"> <li>• Natural hazards assessment</li> <li>• Potential for interaction at national level in context of risk management in terms of development planning</li> </ul>	<ul style="list-style-type: none"> <li>• ASPA strives to improve on outreach and awareness for individual homeowners on their indoor plumbing</li> <li>• Outreach and education</li> </ul>
<b>John Gambel</b>	
<ul style="list-style-type: none"> <li>• Work a lot with inland flooding/hurricanes; research, outreach</li> </ul>	
<b>Alan Mikuni</b>	
<ul style="list-style-type: none"> <li>• Coastal ocean circulation, sediment concentration</li> <li>• Link to GIS</li> <li>• Natural hazard awareness/public outreach</li> <li>• Minimize loss of property from natural disasters making results of science useable to users. community input</li> </ul>	<ul style="list-style-type: none"> <li>• Currently investigating methods of recovering from landslide—providing debris removal and ensuring hazard is mitigated from future occurrence</li> <li>• Water gauges network (real-time data)</li> <li>• Climate stations network</li> <li>• Work a lot with inland flooding/hurricanes; research, outreach</li> </ul>

**Table 3. Opportunities for Enhanced Coordination with Federal Agencies**

<b>Panelist/Remarks</b>	
<b>Mary Glackin</b>	
<ul style="list-style-type: none"> <li>• Mitigation planning</li> <li>• NOAA participation in coastal erosion hazard assessment</li> <li>• Especially in South Pacific/Indian Ocean with FEMA for hazard mitigation and education programs</li> <li>• Regional integrated ocean observing system (IOOS) for Hawai'i for use in hazard mitigation</li> <li>• Share experiences/practices, particularly development of multidisciplinary policies</li> <li>• Like to participate in field test of multidisciplinary, multiscale, information products</li> </ul>	<ul style="list-style-type: none"> <li>• Work with U.S. Coast Guard, Forest Service, other government groups – but include tribal, religious leaders in islands too</li> <li>• Plan where to place resources, ahead of time, in response to disasters, including long-term climatic ones such as El Niño Southern Oscillation (ENSO)</li> <li>• Strengthen existing cooperation, particularly programs in the South Pacific</li> <li>• Shared climate database</li> <li>• Joint partnerships on climate variability and change</li> </ul>
<b>Sally Ziolkowski</b>	
<ul style="list-style-type: none"> <li>• Potential participant in Natural Hazard Disaster Information Network (DIN)</li> <li>• Could benefit from National Geospatial-Intelligence Agency's (NGA) schema in collecting data (digitally)</li> <li>• Digital flood insurance rate map (DFIRM) inclusion in our risk and vulnerability assessments and informing those (locals) who do these</li> <li>• Aerial photography</li> <li>• Light Detection &amp; Ranging (LIDAR) data</li> <li>• Shoreline data exchange</li> <li>• LIDAR collected by NOAA could be used by FEMA for map modernization, but it is not clear if FEMA plans to use the data collected by NOAA to generate new O'ahu and Maui flood maps</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity to collaborate with USGS on the National Map</li> <li>• Incorporate "no-build" zones based on FEMA FIRMs</li> <li>• Describing and ascertaining metrics</li> <li>• Coordinate "pooled" funding to re-map other areas of the state, e.g., coastal, streams, unmapped/newly developed areas</li> <li>• Share experiences in performance-based approach and other elements of good management</li> <li>• Share research findings</li> <li>• Science exchanges/visits</li> <li>• Joint hazards meeting</li> <li>• Establishment of multidisciplinary teams</li> </ul>
<b>Ed Young</b>	
<ul style="list-style-type: none"> <li>• Mitigation planning</li> <li>• Communications provide access to charts that are up to date via electronic navigational charts (ENCs)</li> <li>• Use proposed TCP/IP network for DIN implementation</li> <li>• Use existing partnerships to disseminate climate information</li> <li>• SOPAC has capability to train in information technology and communication (ITC)</li> </ul>	<ul style="list-style-type: none"> <li>• Use RANET (Radio and Internet for the Communication of Hydro-Meteorological and Climate Related Information) for FM climate broadcast (PREL)Can take advantage of community meetings and communication upgrades</li> <li>• Connecting coastal resource management community to take advantage of/help support communication infrastructure</li> <li>• SOPAC can assist in advocating and dissemination</li> </ul>

**Table 3. Opportunities for Enhanced Coordination with Federal Agencies (cont'd)**

<b>Panelist/Remarks</b>	
<b>Ed Young (cont'd)</b>	
<ul style="list-style-type: none"> <li>• Cooperation between external overseas agencies</li> <li>• Improve communication</li> <li>• We face similar technology challenges – limited Internet access, have video teleconferencing (VTC) capabilities, but needs to be upgraded</li> <li>• Work through NWS PRH to bring things to steering committee</li> </ul>	<ul style="list-style-type: none"> <li>• Must get the information out, AND in a user-friendly form, so that the public <u>takes an action</u> based on the information.</li> <li>• Maintenance of telecom systems</li> <li>• Get the ICU on the Emergency Management Weather Information Network (EMWIN) system</li> <li>• Strengthen links with New Zealand's National Institute of Water and Atmospheric Research (NIWA) – perhaps have someone on the Pacific Islands telecom committee</li> </ul>
<b>Jill Meyer</b>	
<ul style="list-style-type: none"> <li>• Use of dynamic models for dispersal &amp; trajectory calculations</li> <li>• Vulnerability assessment methodologies &amp; products                             <ul style="list-style-type: none"> <li>○ communicate to end users</li> <li>○ coordinated efforts</li> </ul> </li> <li>• Mitigation planning</li> <li>• Modeling (impacts, risk)</li> <li>• Coordinate on upland land use assessment</li> <li>• Provide climate forecast info that they may be able to use for post-hazard assessment</li> <li>• “Building bridges”—partnership</li> </ul>	<ul style="list-style-type: none"> <li>• Similar methods but ours are education-focused: data management, education &amp; training, traditional knowledge</li> <li>• Planning site visits &amp; trainings to coordinate between OR&amp;R and PSC</li> <li>• Outreach activities</li> <li>• Share experiences in manuals and good practices</li> <li>• Development of rationales/tools to change attitude</li> <li>• Share decision-making tools and research</li> <li>• Exchange between OR&amp;R staff and NIWA staff</li> </ul>
<b>John McCarroll</b>	
<ul style="list-style-type: none"> <li>• Mitigation planning</li> <li>• Grants for beach nourishment erosion mitigation</li> <li>• Provide climate information</li> <li>• Collaborate on workshops</li> <li>• Setting the right priorities – that will not use up all resources</li> <li>• Should support more outreach activities to the Pacific island countries</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare for ENSO on islands to arrange for water</li> <li>• Share programs and activities (e.g., water programs)</li> <li>• Share experiences in law and regulations to bring about behavioral changes towards resource management</li> <li>• Interested in EPA's regional response team model</li> </ul>

**Table 3. Opportunities for Enhanced Coordination with Federal Agencies (cont'd)**

<b>Panelist/Remarks</b>	
<b>John Gambel</b>	
<ul style="list-style-type: none"> <li>• Communication at local level</li> <li>• Sharing resources</li> <li>• HURREVAC is a great program</li> <li>• Simplifying documentation</li> </ul>	<ul style="list-style-type: none"> <li>• Take decision-making tools to the people, not just the emergency management community</li> <li>• Assist FEMA in the local telecommunication infrastructure</li> </ul>
<b>Alan Mikuni</b>	
<ul style="list-style-type: none"> <li>• Could use USGS stream flow gauge data as inputs to ocean circulation models</li> <li>• Mitigation planning</li> <li>• Land-use portfolio model</li> <li>• Collaboration on Pacific Disaster Center (PDC) Hazard Atlas</li> <li>• Collaboration on Natural Hazard Support System (USGS)</li> <li>• Evaluation model for investment</li> <li>• Investigate possibility of hydrologic outlook</li> </ul>	<ul style="list-style-type: none"> <li>• Climate outlook to USGS for fire hazard management</li> <li>• We are implementing a fire weather program. We partner with USGS Saipan and Hawai'i.</li> <li>• Need to make sure USGS is involved in current process (of developing methods of recovering from landslide)</li> <li>• Training and skill transfer</li> <li>• Share experiences in natural hazard programs and activities (e.g., NIWA's Natural Hazards Centre, or NHC)</li> </ul>
<b>Stan Boc</b>	
<ul style="list-style-type: none"> <li>• Provide climate outlook</li> <li>• We study coastal flooding</li> </ul>	<ul style="list-style-type: none"> <li>• Best practices and code design</li> </ul>

## 3.2. Reports from Regional Organizations

### 3.2.1. Panel Presentations

Presentations were made by representatives from regional organizations involved in risk management within the region. The session allowed the group to learn about programs and initiatives that are relevant to the region and explore opportunities to enhance regional coordination.

Presenters:

- ◆ Atu Kaloumaira, South Pacific Applied Geoscience Commission (SOPAC)
- ◆ Laura Kong, International Tsunami Information Center (ITIC)
- ◆ Laura Kong for Circum-Pacific Council
- ◆ Jackie Burniske, Pacific Resources for Education and Learning (PREL)
- ◆ Paula Carroll, U.S. Coast Guard, Regional Response Team
- ◆ Glenn Lockwood, American Red Cross
- ◆ Carolyn Imamura, Pacific Basin Development Council (PBDC)



### 3.2.2. Reflection Sheets

Participants were asked to complete reflection sheets to comment on two questions for each panelist. The questions were:

- *What lessons can be learned from what you heard, not only in terms of issues and needs but about governance as well?*
- *What opportunities do you see for enhanced coordination?*

Tables 4 and 5 list responses to these questions.

**Table 4. Regional Organizations: Lessons Learned**

<b>Remarks</b>	
<ul style="list-style-type: none"> <li>• Create a short, clear, and easily understood mission statement</li> <li>• Knowledge must be communicated, focused, and understood</li> <li>• No such thing as too much funding or partnerships</li> <li>• Fear factor important in economic analysis</li> <li>• Close coordination and sharing of mitigation actions for island communities</li> <li>• Public information dissemination</li> <li>• Government and community relation needs to be effective</li> </ul>	<ul style="list-style-type: none"> <li>• Increase awareness on policies</li> <li>• Increase education</li> <li>• Awareness of negative impacts of tsunami</li> <li>• Need to reinforce importance of education</li> <li>• Sharing resources and information in addition to cost sharing</li> <li>• Tsunami &amp; seismic information sharing is critical</li> <li>• Technology integration with a focus on training teachers and administrators can help with sustainable development</li> </ul>

**Table 5. Opportunities for Enhanced Coordination with Regional Organizations**

<b>Panelist/Remarks</b>	
<b>Atu Kaloumaira</b>	
<ul style="list-style-type: none"> <li>• Roundtable sessions, sharing of data</li> <li>• We do partner with SOPAC</li> <li>• SOPAC provides services to its region, expanding their coordination with federal agencies</li> </ul>	<ul style="list-style-type: none"> <li>• Partnerships with member countries and others</li> </ul>
<b>Laura Kong</b>	
<ul style="list-style-type: none"> <li>• We do partner with ITSU (International Coordination Group for the Tsunami Warning System in the Pacific) – they help with tsunami education</li> </ul>	<ul style="list-style-type: none"> <li>• WDC/NGDC (World Data Center/National Geophysical Data Center) Web-based Arclmage historical tsunami database – could merge with other hazard map services – NOAA Coastal Services Center historical Hurricane Tracks Mapping Application</li> </ul>
<b>Laura Kong for Circum-Pacific Council</b>	
<ul style="list-style-type: none"> <li>• The risk assessment data from the Crowding the Rim project could be put into one central Internet mapping application with other hazard-related Internet mapping applications, such as historical tsunami mapping application and the NOAA Coastal Services Center Historical Hurricane Tracks Tool – or at least link them all</li> </ul>	
<b>Jackie Burniske</b>	
<ul style="list-style-type: none"> <li>• FEMA’s National Hurricane Program has been looking for more partners to help with education and outreach to school kids about potential hurricane hazard – could partner with PREL</li> </ul>	<ul style="list-style-type: none"> <li>• Could help us develop curricula for typhoon/El Niño courses for elementary, middle, and secondary schools</li> </ul>
<b>Paula Carroll</b>	
<ul style="list-style-type: none"> <li>• We do partner with USCG</li> </ul>	<ul style="list-style-type: none"> <li>• Exchange ocean model fields to Coast Guard for search and rescue, marine environmental protection for Kua`i/Ni`ihau, O`ahu</li> </ul>
<b>Glenn Lockwood</b>	
<ul style="list-style-type: none"> <li>• We do partner with Red Cross</li> </ul>	
<b>Carolyn Imamura</b>	
<ul style="list-style-type: none"> <li>• We do partner with PBDC – Pacific ENSO Application Center is main interaction</li> </ul>	

## 4. ESTABLISHING THE *HUI O HANA*: CANOES AND PADDLES

A “Pacific island risk management framework” was introduced as a model that could be used to support interagency collaboration through joint regional action planning. The framework served as a means to organize the discussion that took place in the subsequent sessions.

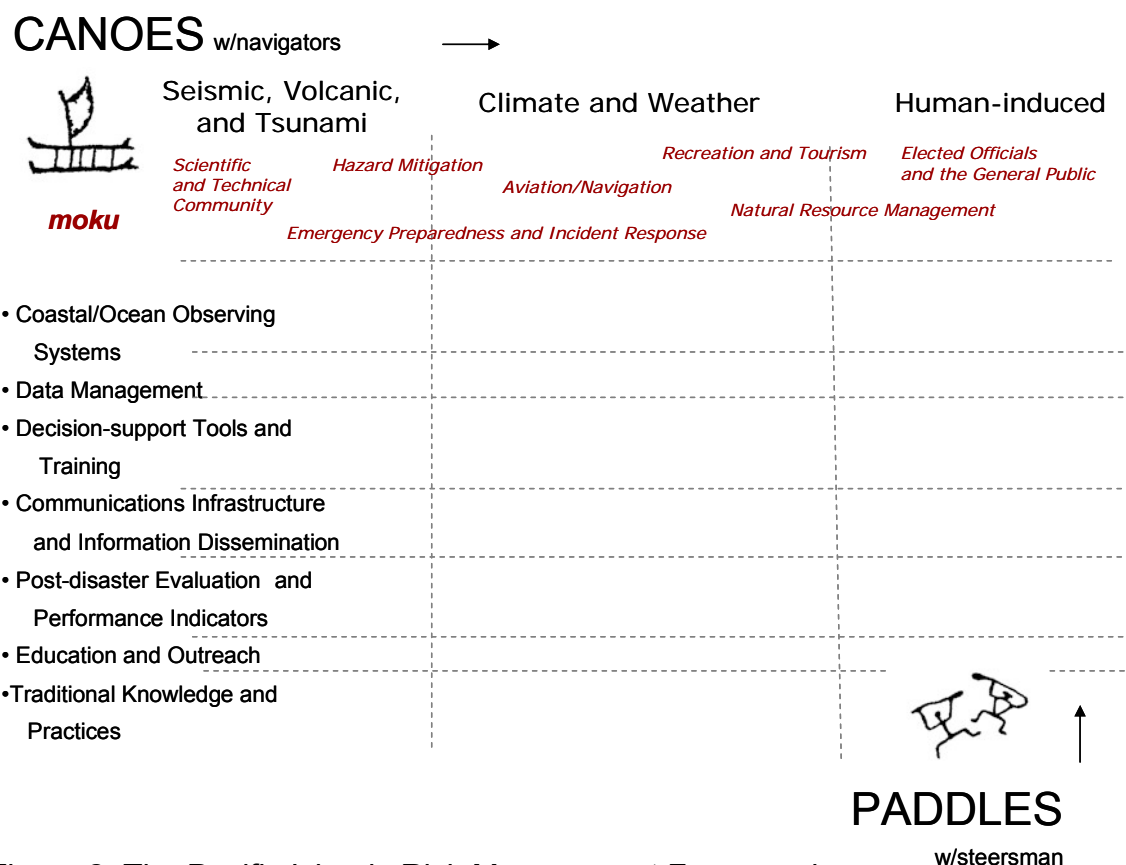


Figure 2. The Pacific Islands Risk Management Framework  
Note that the original framework was modified in response to discussions at the meeting. The modified version can be found in Section 5 of this document.

Central elements of the Pacific risk management framework include the following:

- ◆ *The concept of risk management.* Hazard mitigation is generally defined as any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. Risk management is not limited to longer-term actions that reduce risks to life and property. It encompasses more immediate actions pertaining to disaster preparedness, response, and recovery. It encompasses the full spectrum of a community’s social, economic, and environmental assets. It encompasses the full spectrum of risk management measures, including education and outreach.
- ◆ *A distinction between themes and tools, referred to as canoes and paddles in the*

*matrix.* Themes represent the diverse range of hazards that exist in the Pacific. These hazards include those that are climate- and weather-related, such as tropical cyclones and hurricanes, storm surges, heavy rains and flooding, landslides, drought, and sea-level changes; those associated with seismic or volcanic activity, including tsunami; and those that are human-induced, such as oil spills and discharges of hazardous materials. Risk management–related programs and activities and accompanying information products and services that support decision making are encompassed within these theme areas. *Tools* represent the different types of data and information, systems and technologies, and mechanisms and measures that support inventory, analysis, and implementation needed for the development and delivery of risk management–related information products and services. The tools are coastal and ocean processes and observations; data management; data analysis and decision-support tools; communications infrastructure and information dissemination; post-disaster evaluation and performance indicators; education, outreach and training; and traditional knowledge and practices. The tools are synonymous with the *hui*.

- ◆ *The recognition of use sector, as a subset of themes.* A use-sector, here referred to by the Hawaiian word for island, or *moku*, is the audience for risk management–related information. This audience is composed of diverse groups of users and providers with varying needs in terms of timing, as well as content and complexity. For example, day-to-day permitting and long-term planning conducted by regulatory and resource agency personnel have distinct information and analysis needs. These in turn differ from those of emergency managers focused on response and recovery, where the need for information is relatively immediate. Navigators and aviators, as well as search and rescue personnel and other types of incident responders, are examples of other communities of users within this network. Elected officials, nongovernmental organizations, and the general public are yet other sectors of end users, again with differing information needs. As both users and providers of information, the academic and technical community rounds out this network of partners.

The analogy used at the meeting is that the risk management canoe is filled with products and services associated with a given theme – indicative of goals or objectives at the programs and initiatives level (e.g., climate and weather risk management). That canoe is voyaging towards a specific *moku* (e.g., emergency responders or mitigation planners). The paddles are the tools—*at the projects and activities level*—that can be used to create products and services that meet the identified goals and objectives; they are what moves the canoe forward (e.g., decision-support tools, education and outreach). The paddlers are the representatives of different agencies, institutions, and organizations. They are all together in one canoe. Thus, *E lauhoe mai na wa`a, pae aku i ka`aina*. If everyone paddles the canoe, the shore is reached.

#### **4.1. Establishing the *Hui O Hana*: Canoes**

This session focused on understanding use sector, or *moku*, product and service needs associated with the risk management themes, or canoes, that fall into the sphere of the Pacific risk management *`ohana*. These themes are seismic, volcanic, and tsunami risk; climate and weather risk; and human-induced risk.

Breakout discussions about end-user needs, ideally in the context of product and service specifications, in each of the theme areas were led by designated navigators. Specifically, the small groups addressed the following questions:

- *Who are the (3-4) priority/primary users of products and services in your theme area?*
- *What are the specifications of their product and service needs, in terms of both content and timing?*
- *Who currently is the primary provider of these products and services?*

Navigators reported the results of the breakout sessions to the entire group. Responses to these questions are listed in Table 6.

**Table 6. Primary Users, Product and Service Needs, and Primary Providers by Theme**

Users	Product/Service Needs	Providers
<b>Climate/Weather I – Short term</b>		
<ul style="list-style-type: none"> <li>• Government sector</li> <li>• Private sector</li> <li>• Planner (e.g., land, water, transportation)</li> <li>• Public, households</li> <li>• Researchers</li> </ul>	<ol style="list-style-type: none"> <li>1. General forecasts and information temp, winds, currents, wave height, rainfall, salinity, sea surface height, sea surface and depth temp, relative humidity</li> <li>2. Extreme events               <ul style="list-style-type: none"> <li>• warning</li> <li>• awareness</li> <li>• droughts</li> <li>• tsunami</li> <li>• earthquake</li> </ul> </li> <li>3. General background info               <ul style="list-style-type: none"> <li>• hazard maps</li> <li>• DEM (digital elevation model)</li> <li>• climatology data (means, extremes)</li> <li>• vulnerability data</li> <li>• warning system</li> <li>• identification of hazards</li> <li>• seasonal forecast for short-term use</li> </ul> </li> <li>4. Tailored forecasts and events for specific users and industries</li> </ol>	<ul style="list-style-type: none"> <li>• Government (NOAA, National Environmental Satellite, Data, and Information Service (NESDIS), USGS, FEMA)</li> <li>• Private sector</li> <li>• Planners</li> <li>• Nongovernmental organizations (NGOs)</li> <li>• University/academic</li> <li>• International</li> <li>• (much crossover on primary providers between these)</li> </ul>
<b>Climate/Weather II – Long term</b>		
Regulators	Hazard maps and identification <ul style="list-style-type: none"> <li>• Risk analyses</li> <li>• Climate cycles (expected losses, history, return periods, level of confidence)</li> <li>• Models – Sea Grant, visualizations, scenarios</li> <li>• Training component for inspectors and field staff</li> <li>• Potential interest in lenders</li> <li>• Briefings on impact of current laws and rules</li> <li>• Impact of regulations and how these are enforced</li> <li>• Education, especially with changes in government</li> <li>• Economic impacts</li> </ul>	USGS – hazard maps, erosion Army Corps – storm overwash Martin & Chock – wind speed PEAC – climate forecast NOAA – hurricane
Industries	<ul style="list-style-type: none"> <li>• Hazard maps (in future) e.g., understand lending, development</li> <li>• Return periods of hazards and modeling (insurance and banks)</li> <li>• Fisheries – movement – impacts – budget decisions – fleet decisions and movements</li> <li>• Need climate cycle info and level of confidence</li> <li>• Tourism also needs long-term climate cycle, impacts and predicted losses</li> <li>• Specific loss info (include utilities) and for what predicted losses are actions needed (&amp; level of confidence in product)</li> </ul>	

**Table 6. Primary Users, Product and Service Needs, and Primary Providers by Theme (cont'd)**

Users	Product/Service Needs	Providers
<b>Climate/Weather II – Long term (cont'd)</b>		
Industries	<ul style="list-style-type: none"> <li>• Education &amp; training</li> <li>• Economic impacts</li> </ul>	
Research	<ul style="list-style-type: none"> <li>• Meetings and briefings with science community and decision makers. Product: interpretation</li> <li>• Transitioning research into applications (\$)</li> <li>• Access to data</li> <li>• Hazard maps</li> <li>• Other groups need to define their research needs to researchers</li> <li>• Improvements in observations to support models</li> </ul>	
Emergency Services	<ul style="list-style-type: none"> <li>• Climate cycle data and level of confidence; Risk maps – historical events</li> <li>• Fire suppression information; Drought response – actual actions related to larger plan</li> <li>• Conservation needs; Education component annually</li> <li>• Economic impacts; Public policy</li> </ul>	
General public & outreach	<ul style="list-style-type: none"> <li>• Building code</li> <li>• Regional climatic cycles – predictions to 12 month EN, sea level 3-6 months – level of confidence</li> <li>• Probability of hazard (e.g., drought: chance &amp; severity)</li> <li>• Historical perspective</li> <li>• Suggested lists for protection, economic impact</li> <li>• Insurance in place</li> <li>• Flood areas and history maps and return periods</li> <li>• Tropical cyclones risks – shutters, etc.</li> <li>• Education on reasons for actions and climate – personal risks/impacts from hazards</li> <li>• Traditional ways of predicting</li> </ul>	
<b>Human-Induced Risk</b>		
<ul style="list-style-type: none"> <li>• Responders/ decision makers</li> <li>• Affected parties</li> <li>• Elected officials</li> <li>• Public at large</li> </ul>	<ul style="list-style-type: none"> <li>• Response, cleanup</li> <li>• Exercises</li> <li>• Need to mine local knowledge (for fed. agencies)</li> <li>• Up-to-date, real-time information about event</li> <li>• Planning coordination groups (e.g., RRT, LEPC)</li> <li>• Local needs-driven action strategies (and capacity building to support them)</li> <li>• Build protection of natural and cultural resources into disaster management planning/emergency support functions</li> <li>• Involve those with vested economic interest in planning</li> <li>• Cost and value information</li> </ul>	<p>There are many and various, depending upon the hazard</p>

**Table 6. Primary Users, Product and Service Needs, and Primary Providers by Theme (cont'd)**

Users	Product/Service Needs	Providers
<b>Seismic, Volcanic, and Tsunami</b>		
The public, the at-risk population	Multi-Hazard Map	<ul style="list-style-type: none"> <li>• Univ., NOAA, USGS</li> <li>• Reg. Orgs.</li> <li>• Local Govts.</li> </ul>
Pacific countries	<ul style="list-style-type: none"> <li>• Instructional/Analyses</li> <li>• Risk Analysis Map</li> </ul>	<ul style="list-style-type: none"> <li>• FEMA, et.al.</li> <li>• Engineering Community</li> </ul>
Regions	<ul style="list-style-type: none"> <li>• Risk Assessment Tool</li> <li>• (Context of risk)</li> </ul>	<ul style="list-style-type: none"> <li>• Insurance Community</li> <li>• Local Govts.</li> <li>• Govts.</li> </ul>
Islands At-risk resources	<ul style="list-style-type: none"> <li>• Historical Accounts</li> <li>• Cultural Context</li> <li>• Oral History</li> </ul>	<ul style="list-style-type: none"> <li>• Researchers</li> <li>• Elders/Cities</li> </ul>
Gender	<ul style="list-style-type: none"> <li>• Best Local Practices</li> <li>• Mitigation Planning</li> </ul>	Public/Private Eng
Poverty	Likely Scenarios	Reg/State & Local Govts.
	Economic Context	<ul style="list-style-type: none"> <li>• World Health Organization (WHO)</li> <li>• Insurance</li> <li>• Lending Institutions</li> </ul>
	SOPs (standard operating procedures)	Local Govts.
	Health Context	Public/Private Health
	Infrastructure	Utilities/Govts.
	<ul style="list-style-type: none"> <li>• Hazard Monitoring</li> <li>• Environmental Warnings</li> </ul>	<ul style="list-style-type: none"> <li>• Govts., Univ.</li> <li>• Companies</li> <li>• Political, Religious</li> </ul>
	Post-Disaster Intelligence	<ul style="list-style-type: none"> <li>• First Response</li> <li>• Scientists</li> <li>• NGOs</li> </ul>
	<ul style="list-style-type: none"> <li>• Damage Information</li> <li>• Funding</li> <li>• Recovery/Repair</li> </ul>	<ul style="list-style-type: none"> <li>• NGOs, FEMA</li> <li>• Engineering Community</li> </ul>
<ul style="list-style-type: none"> <li>• Sci/Tech Event Assessment (Continuing)</li> </ul>	<ul style="list-style-type: none"> <li>• Scientists, Govts., Companies, Engineering</li> </ul>	



The discussion then turned to stakeholders. Who else should be invited to the table? Who is missing? The intent is to change who is in the conversation and optimize inclusiveness with efficiency. Missing stakeholders mentioned:

- planners/managers
- elected officials
- property owners
- community end users
- NGOs
- educators
- consumers
- industry
- professional communicators (technical writers, marketing experts, outreach experts)
- lawyers
- media

## 4.2. Featured Projects and Activities

### 4.2.1. Panel Presentations

Presentations consisted of overviews of featured projects and activities within each of the *hui* tools/paddles areas.

Presenters:

- ◆ Pene Lefale, NIWA  
Traditional Knowledge and Practices  
*Local indigenous knowledge of the climate and weather of Pacific Islands*
- ◆ Peter Hacker, International Pacific Research Center (IPRC)  
Coastal and Ocean Observations  
*The Asia-Pacific Data-Research Center (APDRC) Web-based access to atmospheric and oceanic products*
- ◆ Stan Boc, USACE  
Coastal and Ocean Observations, Decision-Support Tools  
*PILOT, surge and run-up modeling, HURREVAC/MMT-MMS*
- ◆ David Kennard, FEMA  
Data Management, Decision-Support Tools  
*Map Modernization, HAZUS-MH, HMPs, and HMP guidebooks*
- ◆ Henry Wolter and Ed Harp, USGS  
Data Management, Post-Disaster Evaluation  
*National Map, seamless DEMs*
- ◆ Russell Jackson, NOAA Coastal Services Center (CSC)  
Data Management, Decision-Support Tools  
*Hurricane Tracks Tool, Hazards Locator Tool, CRA Demographic Assessment Extension, etc.*
- ◆ Kelly Sponberg, NOAA Office of Global Programs (OGP)  
Communications Infrastructure  
*RANET*
- ◆ Chris Chiesa, East-West Center (EWC) Pacific Disaster Center (PDC)  
Data Management, Decision-Support Tools

*Natural Hazards Atlas, Distributed Information Network*

- ◆ Mike Devany, NOAA OR&R  
Decision-Support Tools and Training, Post-Disaster Evaluation  
*CAMEO, ALOHA, ESI Maps*

#### **4.2.2. Projects and Activities Briefs**

Participants were asked to submit a one- to two-page brief on projects and activities they or their agency, institution, or organization are involved in. These briefs were compiled into the meeting notebooks for review at the meeting. Note that a distinction was made between projects and activities, both of which are shorter-term efforts that generate specific products or services, and programs and initiatives, which are longer-term strategic efforts.

## Projects and Activities Briefs

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## **Aiding with Contingency Planning for USS *Arizona*. NOAA Office of Response and Restoration**

### **Project Lead**

Robert Pavia, NOAA Office of Response and Restoration

### **Agency/Institution/Organization Acronym**

OR&R

### **Geographic Area of Interest or Application (region or island)**

Hawai'i

### **Description**

OR&R recently provided the U.S. Navy in Honolulu with trajectory information to help with their contingency planning in the event of a catastrophic release of oil remaining on USS *Arizona*. A simple GNOME (predicts spill movement based on tides and wind) file was created with "guesstimated" tidal currents. This was "guesstimated" because there are no actual current-meter measurements for Pearl Harbor. Therefore, the accuracy of the modeled currents is unknown. However, the tidal currents are weak, so even if the currents we estimated are off by 50%, there will not be a large error in where the oil would go. This file was sent to the people working on the USS *Arizona* planning, and they came up with two specific wind scenarios to model: a trade wind condition and a Kona wind condition. The results of these models are classified information.

## **The Asia-Pacific Data-Research Center (APDRC) as a Product Server for the Pacific Islands Region in the GODAE and GOOS Context. University of Hawai`i, International Pacific Research Center (IPRC)**

### **Project Leaders**

Peter Hacker, Takuji Waseda, Yingshuo Shen, University of Hawai`i, International Pacific Research Center (IPRC)

### **Description**

As the international community moves into the demonstration phase of near-real-time ocean data assimilation and the production of assimilation-based products, there is a need to get the products into the hands of a broad range of users. The Asia-Pacific Data-Research Center (APDRC) at the IPRC, University of Hawai`i, is implementing product server technology and procedures to allow Web-based access to a broad range of atmospheric and oceanic products to the broad user community. In the GODAE context the APDRC is implementing a Product Server for the Pacific Islands region. We hope to do this in partnership with a network of servers and users. The October 2002 Workshop on the Potential Applications of Ocean Observations in the Pacific Islands (Fiji Workshop) recommended the establishment of a Pacific Islands Ocean Information System to facilitate access to and utilization of ocean products. The products would be used to support decision making in four key areas: public safety, climate adaptation, fisheries, and coastal resource management. Needed ocean surface products include temperature, salinity, sea level, currents, winds, and waves including storm surges. The best available satellite and model-based products are needed in near-real-time for this activity. The APDRC plans to contribute to the implementation of a Pacific Ocean information system; regional capacity building; identification of selected regional, operational products meeting the local users' needs; rapid delivery of the products to regional operational users and general users; and user evaluation of the regional products, including feedback to the product originators. The APDRC Web site is <http://apdrc.soest.hawaii.edu/>.

## **Automatic Meteorological Observing Station (AMOS) Replacement Plan. NWS Pacific Region HQ (PRH) Data Systems Branch and Weather Forecast Office (WFO) Guam**

### **Project Lead**

Karl Turner, NWS Pacific Region HQ (PRH) Data Systems Branch; Chip Guard, WFO Guam, Warning Coordination Meteorologist

### **Agency/Institution/Organization Acronym**

PRH, WFO Guam

### **Geographic Area of Interest or Application (region or island)**

Republic of Palau (ROP), Federated States of Micronesia, FSM (States of Yap, Chuuk, Pohnpei, Kosrae), Republic of the Marshall Islands (RMI), Commonwealth of the Northern Mariana Islands (CNMI), Guam

### **Goals/Objectives**

To execute plan to help mitigate the loss of several AMOS remote-observing sites that have become too expensive to maintain.

### **Description**

- WFO Guam identified surface data requirements with the assumption that the current array of AMOS systems will largely not be maintained and will cease to function.
- Only AMOS systems at Ulithi (Yap), Kosrae, and Pagan Island (CNMI) will be maintained; the six HANDAR systems in Guam (4), Rota (1), and Tinian (1) will continue to be maintained.
- Planned systems at Sorol (Yap) and Maloelap (RMI) will not be installed or activated.
- Systems at Ujelang (RMI), Faraulap (Yap), and Nukuoro (Pohnpei) were destroyed and not replaced.
- Systems without maintenance support: Tobi (ROP); Ngulu (Yap); Ulul, Satawan (Chuuk); Oroluk, Pingalap (Pohnpei); Enewetak, Ebon, Mili (RMI).
- Sources of Department of the Interior (DOI) and Navy support for the program are no longer available.

### **Products or Outcomes**

- Expanded observational capabilities of the second order (synoptic) stations.
- Expand tropical cyclone watch/warning points into second order stations.
- Make better use of data from existing TOGA TAO buoy array.
- Attempt to arrange for regional buoy deployments.
- Assessment of AMOS sites that can be maintained by the Weather Service Offices (WSOs) with training and spare parts assistance from WFO Guam.

This initiative complements the initiative on the re-evaluation of tropical cyclone watch/warning points.

### **Partners**

NWS Pacific Region Headquarters, Micronesian WSOs

**Start Date** 1 January 2004



**End Dates:** TBD

## **Bring StormReady / TsunamiReady Status to Guam, Rota, Tinian, Saipan. Weather Forecast Office Guam**

### **Project Lead**

Chip Guard, Warning Coordination Meteorologist, WFO Guam

### **Agency/Institution/Organization Acronym**

WFO Guam

### **Geographic Area of Interest or Application (region or island)**

Commonwealth of the Northern Mariana Islands (CNMI) and Guam

### **Goals/Objectives**

To assist the Guam Office of Civil Defense (OCD) and the CNMI Emergency Management Office (EMO) in becoming compliant with the requirements for recognition as StormReady/TsunamiReady communities. StormReady and TsunamiReady are National Weather Service (NWS) programs designed to elevate the readiness and responsiveness of communities to deal with hazardous weather and tsunami threats, respectively.

### **Description**

- A Committee has been formed on Guam to assist Guam OCD with assessing the Island's capabilities in meeting the StormReady/TsunamiReady criteria and to take the necessary actions to comply.
- OCD is awaiting arrival and installation of radios that can decode NOAA Weather Radio (NWR).
- Meetings are being held to assess the status of completion of necessary actions.
- Letters have been written to all Island mayors soliciting their support for the StormReady/TsunamiReady programs.
- A StormReady display has been obtained for local briefing to the community.
- Guam and CNMI are not eligible for all of the CONUS benefits.

### **Products or Outcomes**

- Have Guam StormReady/TsunamiReady by 15 September 2004.
- Have Saipan StormReady/TsunamiReady by 15 September 2005.
- Have Rota and Tinian StormReady/TsunamiReady by 15 September 2006.

### **Partners**

NWS Headquarters, Pacific Region Headquarters, OCD, CNMI EMO, UOG WERI, island mayors.

**Start Date:** 1 January 2004

**End Dates:** 2006

## **Building Spatial Technology Capacity in U.S. Flag Pacific Island Coastal Management Communities. NOAA Pacific Services Center**

### **Project Lead**

Darcee Killpack, Spatial Technology Coordinator, NOAA Pacific Services Center

### **Geographic Area of Interest or Application (region or island)**

U.S. Flag Pacific Islands

### **Goals/Objectives**

The project will build sustainable local capacity and knowledge in spatial technologies in the Pacific Island coastal management communities through the delivery of continual introductory and intermediate trainings to island coastal managers. The project will also provide continual technical support to island coastal management communities on spatial technologies and spatial data through the Pacific Islands Assistantship and additional support.

### **Description**

Reliable access to spatial technology training and technical support is difficult in the Pacific. PSC can play a strong role with the island coastal communities by providing continual opportunities for introductory, intermediate, and advanced spatial technology training, in addition to providing technical support as spatial technologies are integrated into their management activities and functions. This project focuses on bringing training and technical support opportunities to the islands.

PSC is also supporting the need for on-site support in the integration of GIS and related spatial technologies into coastal and marine resource management through the Pacific Islands Assistantship (PIA). PIA was originally created by the NOAA Coastal Services Center in 2001 and places four assistants in the Island coastal and natural resource agencies of Guam, American Samoa, Hawai'i, and CNMI. The assistants provide technical support in spatial technologies, conduct public outreach and education programs, and develop advanced GIS data and applications.

PSC is supporting local capacity building through three efforts.

The first effort is the Pacific Islands Assistantship and the transfer of technical expertise to the local management agencies. In addition to placing the assistants in the islands, PSC and the NOAA Coastal Services Center are hosting a technical training in Charleston, South Carolina, in May of 2004. This training will include not just the assistants, but also the local technical mentor to further support information exchange and local capacity building. It will focus on remote sensing, GPS, metadata, and some of the new advances of GIS, such as Internet map servers, databases, and customization of GIS software.

The second effort continues to provide training opportunities in the islands. Last year, PSC and the Coastal Services Center coordinated remote sensing training in Hawai'i and American Samoa, and metadata and GPS training in Guam, CNMI, American Samoa, and Guam. This year we will be bringing ESRI's Introduction to ArcGIS and the Coastal Services Center's Coastal Applications for ArcGIS training classes to Guam and Saipan, CNMI, in May 2004. These classes total four days of training and provide the basis for using ArcGIS in a coastal environment.

The third effort builds off PSC's continual support for training in the Pacific. PSC has been working with a private contractor for the past year on the development of a geospatial analysis course, Fundamentals of Spatial Analysis. This training course will help to build a foundation of GIS skills and theory in the natural resource communities in the Pacific. The course should be completed by the end of 2004. PSC is also updating a GIS course focused on managers who need a basic understanding of the functionality of GIS. This course should be in draft form by the end of 2004.

**Products or Outcomes**

Greater number of GIS coastal management users trained in spatial analysis (including GIS, remote sensing, the Global Positioning System, and metadata).

**Partners**

State of Hawai'i Office of Planning, State of Hawai'i Coastal Zone Management, City and County of Honolulu, County of Maui, County of Hawai'i, Hawai'i Natural Heritage Program, University of Hawai'i CNMI Coastal Resources Management Office, Northern Mariana Community College, American Samoa Coastal Management Program, American Samoa Community College, American Samoa National Park, Guam Coastal Management Program, University of Guam Marine Laboratory

**Start and End Dates**

Introduction to ArcGIS and Coastal Applications using ArcGIS will be taught by NOAA ESRI-certified instructors in Guam and Saipan, CNMI, May 17 to 28, 2004. The assistantship training will be in Charleston, South Carolina, May 10 to 14, 2004.

## **Capacity Building for the Development of Adaptation Measures in Pacific Island Countries (CBDAMPIC). South Pacific Regional Environment Programme (SPREP).**

### **Project Lead**

Taito Nakalevu

Climate Change Adaptation Officer  
SPREP, P.O. Box 240, APIA, SAMOA

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### **Agency/Institution/Organization Acronym**

South Pacific Regional Environment Programme (SPREP)

### **Geographic Area of Interest or Application (region or island)**

Cook Islands, Fiji, Samoa, Vanuatu

### **Goals/Objectives**

To develop and implement a capacity-building programme that will increase the capability of four Pacific Island countries to reduce climate-related risks at the national and community level.

### **Description**

The Capacity Building for the Development of Adaptation Measures in Pacific Island Countries project focuses on improving sustainable livelihood of Pacific Island people by increasing their capacity to adapt to climate-related risks. This is Canada's response to the call by Pacific Island countries for assistance to develop and implement a capacity-building programme that will reduce climate-related risks at the national and community level. The Canadian-funded project will be executed by SPREP.

### **Products or Outcomes**

Outcomes:

The project has two outcomes. First, the activities of the project will bring adaptation to climate change into the normal processes of national and sectoral planning and budgeting known as "mainstreaming." Secondly, the project will increase the capacity of communities to adapt to climate-related risks and reduce their vulnerabilities.

Outputs:

1. Policy and decision makers will be more aware of the threat of climate change to their people's livelihoods and economic sectors. They will also understand the options that could be put in place at national and community level to increase adaptive capacity.
2. Senior government policy makers will be committed to integrate and mainstream climate change adaptation into national and sectoral policies. To assist in this process, climate change risk management will be incorporated into national planning.
3. Communities will be increasingly aware of their vulnerability to climate change and the traditional and contemporary ways that are available for them to adapt to it.

4. The pilot projects implemented in the selected communities will reduce their vulnerability to climate change–related effects.

**Partners**

- Canadian International Development Agency
- Governments of Samoa, Cook Islands, Vanuatu, and Fiji

**Start and End Dates:** Jan. 2002 to March 2005

South Pacific Regional Environment Programme (SPREP)

P O Box 240, Apia, Samoa

Tel: +685 21929; Fax: +685 20231

Website: [www.sprep.org.ws](http://www.sprep.org.ws)

Email Contact: [sprep@sprep.org.ws](mailto:sprep@sprep.org.ws)

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## **Cleanup of Pearl Harbor Naval Complex. NOAA Office of Response and Restoration**

### **Project Lead**

Laurie Sullivan, NOAA Office of Response and Restoration

### **Agency/Institution/Organization Acronym**

OR&R

### **Geographic Area of Interest or Application (region or island)**

Hawai'i

### **Description**

The Coastal Protection and Restoration Division of OR&R has been working with the Department of Navy, U.S Air Force, U.S. EPA, and the Hawai'i Department of Health to determine levels of contaminants cleanup needed at the Pearl Harbor Naval Complex and at Hickam Air Force Base to be protective of the marine resources of Pearl Harbor and surrounding environs. The Pearl Harbor complex, which is a National Priorities List Superfund site, is of particular interest because of the dominant ownership by the Navy and the level of contamination found in the harbor. Pearl Harbor is currently under a fish-consumption advisory due to levels of contaminants found in fish from the harbor.

## **Damaging Swells Hazard Mitigation. METEO-FRANCE**

### **Project Lead**

Marie-Christine Laurent, METEO-FRANCE – Regional Direction for French Polynesia

### **Agency/Institution/Organization Acronym**

METEO-FRANCE - DIRPF

### **Geographic Area of Interest or Application (region or island)**

French Polynesia, Center of the Northern and the Southern Pacific

### **Goals/Objectives**

- To enhance technical exchange, communication, coordination, and collaboration of hazard mitigation network partners in the Pacific Islands.
- To engage in a technical exchange because of Pacific and overall Polynesian atoll's vulnerability to damaging swells that come in from the North Pacific.
- To improve damaging swells forecasting and related decision-support tools.

### **Description**

French Polynesia: coral crowns on the rims of ancient sunken volcanoes; 78 atolls, the largest chain of coral atolls in the world. From November to March, very powerful swells hit our islands. They cause very dangerous currents around the passings, making them impracticable. They can destroy the black pearl farms, and flood the areas of population, the airports and so on.... They can also flood the coastal areas of the high islands of the archipelago of the Société and be murderous. They arrive in French Polynesia a few days after having hit Hawai'i North Shore according to the wavelength. They can exceed 5 meters height. They last 2 to 4 days while crossing our territory.

- To set up a swell damage assessment and reporting tools designed to facilitate collection, mapping of vulnerable areas, analysis and reporting of building inventory information for the purpose of pre- and post-strong swell damage assessment.
- To set up a Web-based tool to help decision makers.
- To give a better understanding of what options are available.
- To increase the observations network: swell measure systems, ships, observations of the SMN, specific satellite data.
- To develop a specific data satellite stream for the Pacific to enhance the network.
- To multiply the exchanges and settle effective links between NWSPR, WFO Honolulu, RSMC Honolulu – Hurricane Center...
- To develop trainings.
- To choose effective transmission and diffusion supports.
- To use the Internet more, a cheap and reliable communications system accessible to all.
- To set up an effective alert system.

### **Products or Outcomes**

- Better forecasting of damaging swells.
- Better understanding of what risk management options are available.
- More accurate and rapid identification of areas susceptible to suffer the effects of strong damaging swells.



- More accurate knowledge of the island's vulnerability to strong swells.
- Better ability to reduce the economic, social, and environmental impacts of strong swell hazards.

**Potential Project Partners**

NWSPR (National Weather Service Pacific Region), WFO Honolulu (Weather Forecast Office), RSMC Honolulu – Hurricane Center, NOAA National Weather Service, NOAA Coastal Services Center, American Samoa Coastal Management Program

## **Develop Typhoon Vulnerability Studies for U.S.-Affiliated Islands. Weather Forecast Office Guam**

### **Project Lead**

Chip Guard, Warning Coordination Meteorologist, Weather Forecast Office (WFO) Guam

### **Agency/Institution/Organization Acronym**

WFO Guam

### **Geographic Area of Interest or Application (region or island)**

Republic of Palau (ROP); Federated States of Micronesia (FSM) and States of Yap, Chuuk, Pohnpei, Kosrae; Republic of the Marshall Islands (RMI); Commonwealth of the Northern Mariana Islands (CNMI).

### **Goals/Objectives**

To develop typhoon vulnerability studies for the U.S.-affiliated western North Pacific Islands similar to the one produced for Guam Civil Defense by the University of Guam (UOG) Water and Environmental Research Institute (WERI) with FEMA funding.

### **Description**

- A study and the resulting reference document are needed for the U.S.-affiliated Micronesian Islands that identify typhoon-related hazards, typhoon risk, and the vulnerability of the islands to tropical storms and typhoons. Such a document was produced for Guam in 1998.
- Several proposals were written by UOG WERI to conduct such a study and produce a document, but the proposals were never approved for funding.
- The warning coordination meteorologist and the meteorologist-in-charge at each of the major islands will work jointly to produce a vulnerability study, but on a smaller scale from the Guam study.
- Studies will be accomplished for ROP; FSM States of Yap, Chuuk, Pohnpei, Kosrae; RMI; CNMI.
- WSO Pohnpei will be responsible for both Pohnpei and Kosrae States. WFO Guam will be responsible for the CNMI.

### **Products or Outcomes**

- The first drafts will be completed in 2004.
- The final draft will be completed in 2005.
- Publication will be in 2005 or 2006.

**Partners:** NWS Pacific Region Headquarters, WSOs, UOG WERI

**Start Date:** 1 January 2004

**End Date:** 2006

## **Digital Comprehensive Planning (Integrated Urban Growth and Disaster Modeling). Prescott College, Sustainability and Global Change Program**

### **Project Lead**

Wilson W. Orr, Prescott College, Sustainability and Global Change Program

### **Geographic Area**

U.S., nationally

### **Objective**

To provide decision makers with practical software models which portray in 3D the consequences of various development policy options – and the impacts of future disasters and resource consumption patterns out to a 50 year time horizon.

### **Description**

This software modeling suite provides jurisdictions with the planning tools to match both the pace-of-change and range of complex/interconnected issues in their communities. Current problems and crises seem to quickly outrun the response time of existing planning tools and processes. Developed by the NASA/BlueLine Group at Prescott College (AZ), this model-based complement to the traditional written document will build a variety of future community growth scenarios based on current policy and development decisions. The model is structured to provide impact assessment using one (or more) of 4 elements:

1. Spatial Growth Model for population and land use change
2. Short Term Impact Model for disaster impact planning and assessment
3. Long Term Impact Model for long term resource and infrastructure impact assessment
4. Sustainability Indicator quantifies sustainability as a function of resource consumption by land use type

These four model elements, once built for a jurisdiction, provide a unique complement to the legacy, written plan. Three-dimensional visualization of long-term consequence scenarios provides the capability to “connect the dots” of rapid change across disciplines, political boundaries, and time. This technology begins to equip planners and decision-makers with tools that match the clockspeed of change in their communities and better utilize emerging earth science to anticipate the consequences of current decisions. With some \$500 million spent annually on comprehensive plans which provide poor analytical capability, this cheaper alternative using live models to test policy changes can provide greater service at less cost for jurisdictions with an eye toward long-term vitality and resilience.

Projects in progress or completed are with Santa Barbara, Gallatin County (MT), Maui County, County of Hawai'i, Yavapai County (AZ), Hawai'i State Civil Defense, Town of Camp Verde (AZ), State of Florida, Bay County (FL), Tampa Bay Regional Planning Authority, Burke County (NC), , Bureau of Land Management (AZ), the Sonoran Institute, the Cape Cod Regional Planning Commission, USGS, Penn State, United Arab Emirates, and the Tahoe Regional Planning Agency.

Wilson W. Orr; [worr@prescott.edu](mailto:worr@prescott.edu); 928-899-6365

## **Environmental Assessment and Planning, South Pacific Regional Environment Programme (SPREP)**

### **Project Lead**

Matt McIntyre  
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Sustainable Economic Development Division  
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### **Agency/Institution/Organization Acronym**

South Pacific Regional Environment Programme (SPREP)

### **Geographic Area of Interest or Application (region or island)**

14 Pacific Island countries (PICs)

### **Goals/Objectives**

To enhance regional and national capacity for integrated environmental decision making for sustainable development.

### **Specific Objectives**

- To improve the confidence of members to use and implement Environmental Impact Assessment (EIA) methods and supportive legal and policy platforms in the pursuit of sustainable development.
- Promote the local benefits of Strategic Environmental Assessment (SEA) and corresponding environmental planning systems, and other contemporary decision-support systems to identify opportunities for sustainable development and environmental management;
- Improve the integration between environmental strategies and national mechanisms for strategic and sector planning and development (physical, social, and economic).
- Improve resource use and conservation and planning tools and techniques available and suited to the Pacific Island countries

### **Description**

Most Pacific Island countries have instituted, in a fashion, legislative or policy processes for the completion of EIAs for significant development. Commonly, countries are concerned with the operational status of EIAs and the ability for integrating development assessment processes. All PICs give EIAs a high priority for environmental protection, as well as for providing the initial tool for integrated assessment for sustainable development. Many give an indication that much more work needs to be done to enable

- Equitable administration of EIAs;
- Acquisition of skills and experience through on-the-job and organized training; Integration of EIA processes with physical development processes;
- Explicit criteria and guidelines for development and environmental protection;
- (For the more advanced PICs) the use of Strategic EIAs for land use, policy assessment, and a means to satisfy multilateral environmental agreements (MEAs);
- Improvements in the methods and benefits that may accrue from early public participation in development–environmental protection debates;

- Better information and data characterized to a standard to assist in EIA and other associated decision-making.

### **Products or Outcomes**

#### *1. Establish an Environment Assessment Facilitation Office*

The 1998 Experts Review meeting in Christchurch was very strong in calling for a Facilitation Office to assist with technical matters and advisory services to PICs.

#### *2. Awareness, Communication & Training:*

An EIA is considered an anti-development tool by many communities in the Pacific. This perception may be a symptom of the means of introduction and practice to date of EIA processes. An EIA can be instigated in a reactionary manner at the end of development processes where many commitments and political and financial lobbying has occurred – this leads to conflict. Conflict in development and environmental management does little to invoke confidence. Much needs to be done to improve confidence in EIAs. Means to achieve this may best commence with a greater understanding of what an EIA is and what it tries to achieve. An EIA is a planning tool and as such is generally only workable when operated in the context of a planning system. Many PICs do not have land or resource use planning systems, and without these foundations upon which to proceed with more positive interventions and processes to fossick “opportunities” for development, positives of environmental assessment processes are not easily conveyed.

#### *3. Production of EIA and Planning Toolkits & Fact Sheets*

Some of the best tools for change of practice in decision making is the existence and access to reference material. This material could be compendiums of good EIA and SEA practices, prototype terms of reference (TORs), resource survey standards, toolkits of land and coastal resource development guidelines, administrative guides, and model provisions for laws and conditions of approval.

For PICs with or without formal EIA or planning legislation or provisions, there are dearth sources or access to such material. Toolkits inclusive of the above aspects will be generated, and be extended to the provision of information on the use of environmental economics in development decision making.

#### *4. EIA and Integrated Environmental Planning Promotion*

The crux of successful and efficient inception and use of various environmental assessment techniques, processes, and mechanisms is a planning base to provide the platform for flexible application and integration. This component aims to place techniques into the context of environmental planning practices. Case study documentation will aim to identify examples of integrated planning for sustainable development. Demonstration cases covering land resource assessment, land capability assessment, landscape assessment, urban & rural settlement, incorporation of hazard and risk assessments, integrated catchment and coastal management, and tourism and natural resource use planning will be targeted.

#### *5. Integrated Environmental Planning Law*

As mentioned the legal platforms provide the necessary foundations for equitable planning systems and application of EIA and SEA techniques. A number of countries are asking the Secretariat for assistance with integrated environmental law packages. Given the lack of human and financial resources in many PICs, these contemporary laws need to be lean, effective, respectful of traditional practices, and

applicable to key threats without placing onerous bureaucratic processes on local communities.

**Partners Known**

Council of Regional Organizations in the Pacific (CROP) agencies, UN Environmental Programme, New Zealand Agency for International Development (NZAID); Potential: Asian Development Bank, Australian Agency for International Development (AusAID)

**Start and End Dates**

Inception at regional level: 2003

Operational commencement: 2004

First completion phase: 2006

## **Environmental Sensitivity Index (ESI) Maps – American Samoa. NOAA Office of Response and Restoration (OR&R)**

### **Project Lead**

Ruth Yender, Scientific Support Coordinator

### **Agency/Institution/Organization Acronym**

Office of Response and Restoration (OR&R)  
NOAA Hazmat

### **Geographic Area of Interest or Application (region or island)**

American Samoa

### **Goals/Objectives**

A main objective of spill response in the United States, after protecting human life, is to reduce the environmental consequences of both spills and cleanup efforts. To do this, it is necessary to identify vulnerable coastal locations before a spill happens so that protection priorities can be established and cleanup strategies identified. The purpose of the ESI maps is to assist in planning oil spill response strategies; they are also used during the initial spill response.

### **Description**

ESI maps are maps with environmental data overlaid on shoreline maps. Shorelines are color-coded to show their sensitivity to oiling. For example, shorelines shown in red are salt marshes that are especially vulnerable to oil. Symbols mark locations important to spill responders, such as areas where seals or sea lions congregate or breed (marked with a sea lion symbol), areas where different kinds of birds (such as shorebirds, waterfowl, or raptors) concentrate for feeding or nesting, and areas used by people (such as an aquaculture facility, indicated on this map by an "AQ" symbol, and a recreational beach, marked by a sun umbrella).

### **Products or Outcomes**

An ESI Atlas, which is a collection of maps, covering American Samoa.

### **Partners**

NOAA's ESI mapping is a cooperative effort with the primary state response agency, other state and federal agencies, and industry.

### **Start and End Dates**

Completed 2003

## **Extending NOAA Coastal Natural Hazards-Related Products in the Pacific. NOAA Pacific Services Center (PSC), NOAA Coastal Services Center**

### **Project Leads**

NOAA Pacific Services Center (PSC)

NOAA Coastal Services Center

**Agency, Institution, Organization Acronym:** NOAA Coastal Services Center, NOAA PSC

**Geographic Area of Interest or Application:** U.S. Flag Pacific Islands: Territory of American Samoa; Territory of Guam; Commonwealth of the Northern Mariana Islands; State of Hawai`i

**Goals/Objectives:** Support the development and dissemination of locally applicable, regionally replicable natural hazards–related decision-support tools.

**Description:** NOAA has focused much expertise and technical resources toward mitigating impacts of natural hazards on coastal communities. This significant effort has resulted in the development of a number of technology-based products designed to help coastal communities plan for, respond to, and recover from natural hazards. Application of these management tools in the Pacific is presently limited by (1) the current status of coastal hazards–related analytical data for the Pacific Islands and (2) the need for tool modification to include considerations specific to Pacific Island coastal communities. Working one U.S. Flag Pacific Island jurisdiction at a time, this project will coordinate the organization of relevant data, provide an appropriate level of vulnerability analysis, and improve access to information regarding coastal hazards.

Decision-support tools currently under or being considered for development include the following:

- Pacific Islands Demographic Vulnerability Assessment Tool (PIDVAT), a desktop GIS-based tool which automates the process of identifying the location of potentially vulnerable populations (Societal Vulnerability) using data from the U.S. Census Bureau. This will involve customization of an existing DVAT for use in the Pacific Islands.
- Village-scale Coastal Hazards Atlas, a coastal hazards atlas for each of the U.S. Flag Pacific Islands based on a prototype being developed for the Territory of American Samoa. This prototype will be completed in multiple phases. Phase One will involve creating village-scale Coastal Hazards Vulnerability data layers. This first phase will also include the creation of village profiles describing the specific and overall hazard vulnerabilities for each village. Phase Two will involve the inclusion of additional village-scale vulnerability layers, possibly including demographic vulnerability, critical facilities vulnerability, economic vulnerability, and environmental vulnerability.
- Slope Movement Assessment and Reporting Tool (SMART), a unified, user-friendly GIS-based tool designed to facilitate the analysis and mapping of areas susceptible to slope movement and that can be used to flag areas where further, more detailed investigations are warranted.
- Risk Management Measure Assessment Tool (RMMAT), a Web-based tool to help decision makers identify preferred risk management measures by giving them a better understanding of what options are available and how to evaluate the applicability of these options.



- Pacific Islands Building Inventory Collection Tool (PIBICT), a unified, user-friendly geographic information system (GIS)-based tool designed to facilitate collection of building inventory information for the purpose of pre- and post-storm damage assessment.

**Products or Outcomes**

- Improved ability of coastal communities to reduce the economic, social, and environmental impacts of coastal natural hazards.

**Potential Project Partners:** NOAA Coastal Services Center, NOAA Office of Ocean and Coastal Resource Management, Hawai'i Coastal Zone Management Program, Hawai'i Department of Land and Natural Resources, American Samoa Coastal Management Program, American Samoa Territorial Emergency Management Coordinating Office, American Samoa Community College, American Samoa Power Authority, Guam Coastal Management Program, CNMI Coastal Resources Management Office, NOAA National Coastal Data Development Center (NCDDC), NOAA National Weather Service, Federal Emergency Management Agency, U.S. Geological Survey, University of Hawai'i Social Sciences Research Institute, University of Hawai'i Department of Civil Engineering, Kamehameha Schools, East-West Center's Pacific Disaster Center, Martin and Chock, Inc., and others.

**Start Date:** April 2004

**End Date:** Ongoing

## Federal Hazard Mitigation Partners in the Pacific Islands Activity Report, NOAA Pacific Services Center

### Project Lead

John Marra, NOAA Pacific Services Center

### Agency, Institution, Organization Acronym

PSC

### Geographic Area of Interest or Application

Pacific Region

**Goals/Objectives:** Enhance opportunities for coordination and collaboration among the range of agencies, institutions, and organizations involved in risk management in the Pacific Islands.

**Description:** Facilitating an ongoing post-meeting dialogue was at the top of the list of items identified in the 2003 FHMPPI meeting's embryonic action plan. This Web-based report summarizes hazard mitigation-related projects and activities that have been recently completed or are about to get under way in the Pacific Islands in the context of the *hui o hana* topic areas.

- Climate Risk Management
- Seismic and Volcanic Risk Management
- Tsunami Risk Management
- Coastal and Ocean Processes and Observations
- Data Management
- Data Analysis and Decision-Support Tools and Training
- Communications Infrastructure and Information Dissemination
- Post-Disaster Evaluation and Performance Indicators
- Education and Outreach
- Traditional Knowledge and Practices

Currently, it is produced on a quarterly basis. The most recent report can be viewed at [www.csc.noaa.gov/psc/FHMPPI/fmparcurrent.html](http://www.csc.noaa.gov/psc/FHMPPI/fmparcurrent.html)

### Products or Outcomes

- Better understanding of what projects and activities are under way. Hazard mitigation-related projects and activities that have been recently completed or are about to get under way in the Pacific Islands.
- Improved ability of coastal communities to reduce the economic, social, and environmental impacts of coastal natural hazards.

Enhance communication, coordination, and collaboration among federal network partners in the Pacific Islands:

- Describe agency, institution, or organization hazard mitigation projects and activities—what they involve, where they are being conducted, by whom, and when;
- Identify gaps and overlaps, priority needs, and information dissemination challenges and opportunities;

- Develop an action plan to support sustained dialogue among Pacific Island partners; and
- Cultivate a sense of community and an appreciation for the unique physical and cultural characteristics of the Pacific Islands.

**Potential Project Partners:** NOAA Coastal Services Center, NOAA Office of Ocean and Coastal Resource Management, Hawai'i Coastal Zone Management Program; Hawai'i Department of Land and Natural Resources, American Samoa Coastal Management Program, American Samoa Territorial Emergency Management Coordinating Office, American Samoa Community College, American Samoa Power Authority, Guam Coastal Management Program, CNMI Coastal Resources Management Office, NOAA National Weather Service, Federal Emergency Management Agency, U.S. Geological Survey, University of Hawai'i Social Sciences Research Institute, University of Hawai'i Department of Civil Engineering, Kamehameha Schools, East-West Center's Pacific Disaster Center, Martin and Chock, Inc., and others.

**Start Date:** August 2002

**End Date:** Ongoing

## **Fire Weather Support Program for the Mariana Islands. Weather Forecast Office Guam**

### **Project Lead**

Chip Guard and Paul Stanko, Weather Forecast Office (WFO) Guam

**Agency/Institution/Organization Acronym:** WFO Guam

### **Geographic Area of Interest or Application (region or island)**

Guam, Saipan, Rota, Tinian (Mariana Islands)

### **Goals/Objectives**

To provide the necessary meteorological information and Red Flag criteria to alert Guam Forest Service and CNMI Forest Service of fire potential.

### **Description**

- Joint initiative of WFO Guam, the U.S. Forest Service, and the Guam Department of Agriculture Forest Service Division
- Will develop a fire model for Guam and the Mariana islands
- Will provide Red Flag criteria
- Will identify routine information and forecasts needed by the regional fire services

### **Products or Outcomes**

- Red Flag Criteria
- Red Flag Warning (Likely)
- Fire Weather Planning Forecast (Likely)
- Fire Spot Forecast for Fuel Break/Ballpark Burn (Possible)
- Smoke Management Forecast (Possible)

The products will be provided daily from December through May of each year (Dry Season). Red Flag warnings will be disseminated as needed.

**Partners:** U.S. Forest Service, Guam Department of Agriculture Forest Service Division, USDA Natural Resources Conservation Service, University of Guam Water and Environmental Research Institute (WERI). CNMI partners are to be determined.

**Start Date:** 1 January 2004

**End Date:** 1 October 2004

## Flood Hydrology and Post-Flood Assessments

### Project Leads

Richard Fontaine, Barry Hill, and Delwyn Oki, U.S. Geological Survey, Water Resources Division (WRD), Honolulu, Hawai'i

### Agency/Institution/Organization Acronym

USGS

### Geographic Area of Interest or Application (region or island)

Pacific Region

### Goals/Objectives

1. To describe the magnitude and frequency of flooding on streams in Hawai'i.
2. To describe streamflow response associated with specific, extreme storm events.
3. To provide timely hydrologic data to users.

### Description

Goal 1 – Flooding on streams in Hawai'i

- Document the magnitude and frequency of floods at data collection sites in Hawai'i.
- Develop regression equations, based on easily measured watershed characteristics, which can be used to estimate the magnitude and frequency of floods at sites where no data collections sites have been operated.

Goal 2 – Extreme storm events

- Determine the magnitudes of peak streamflow at selected locations in flood-impacted areas.
- Determine the recurrence intervals associated with flood peaks.
- Document specific factors, such as the distribution and intensity of rainfall, that contributed to the occurrence and timing of the flood peaks.

Goal 3 – Timely hydrologic data

- Disseminate near real-time streamflow and rainfall data to users.

### Products or Outcomes

Goal 1 – Flooding on streams in Hawai'i

- A report summarizing the project is being prepared. This report will provide more accurate methods for determining the magnitude and frequency of flooding in Hawai'i.

Goal 2 – Extreme storm events

- USGS Water-resources Investigations Report 02-4117, "Streamflow and Erosion Response to Prolonged Intense Rainfall of November 1-2, 2000, Island of Hawai'i, Hawai'i."
- USGS Fact Sheet 061-03, "Flooding Associated with Typhoon Chata'an, July 5, 2002, Guam."

Goal 3 – Timely hydrologic data

- Real-time streamflow data for 21 streams and rainfall data for eight sites in Hawai'i are provided on the USGS Web page at <http://hi.water.usgs.gov>. These data include those for the Kawainui Marsh flood-warning network, a real-time data network developed and operated specifically to provide flood-warning data directly to appropriate management and disaster response agencies.

### **Partners**

I will restrict this list to partners that are currently providing funding to support the above activities and projects. A list of potential partners would include any group or agency that has any dealings related to stream flooding and would be extensive.

Active partners include Hawai'i Department of Land and Natural Resources (Engineering and Land Divisions) and the Commission on Water Resource Management, Hawai'i Department of Transportation, U.S. Army Corps of Engineers, National Weather Service, U.S. EPA, Honolulu Board of Water Supply, Honolulu Department of Planning and Permitting, Honolulu Department of Environmental Services, Hawai'i Department of Agriculture, Maui County Department of Water Supply, Hawai'i County Department of Water Supply, Hawai'i County Department of Public Works, Hawai'i Department of Health, American Samoa Power Authority, American Samoa EPA, University of Guam WERI, U.S. Navy, CNMI Public Utilities Corporation, Palau Ministry of Resource Development, and National Tropical Botanical Gardens.

### **Start and End Dates**

Goal 1: Start date March 2002 End data September 2004

Goal 2: Ongoing

Goal 3: Ongoing

## **Gender Equality and Disaster Reduction Workshop. University of Hawai'i Social Science Research Institute (SSRI)**

### **Project Lead**

Cheryl Anderson, Program Manager  
Elaine Enarson, Co-planner

### **Agency/Institution/Organization Acronym**

University of Hawai'i Social Science Research Institute (SSRI)  
With sponsorship from USAID Office of Foreign Disaster Assistance, USDA Foreign Agricultural Service, UN International Strategy for Disaster Reduction, the University of Hawai'i, the East-West Center, and the Gender and Disaster Network.

### **Geographic Area of Interest or Application (region or island)**

International workshop with interest to all regions and islands. Workshop will take place in Honolulu, Hawai'i, at the East-West Center.

### **Goals/Objectives**

The goal of this workshop is to build actual strategies and develop practical tools relating to recommendations from previous work on gender equality and disaster risk reduction. Some of the objectives are the following:

- Make new connections between gender, development, and disaster
- Learn about women's grassroots work to prevent disasters
- Identify existing and needed tools and resources
- Increase organizational capacity to engender disaster work
- Contribute to a new gender and disaster sourcebook of educational materials
- Mentor the next generation of disaster managers
- Support men and women in nontraditional disaster work
- Build community

### **Description**

The "decade of disasters" vividly demonstrated how catastrophic social events are gendered and the corresponding need for engendering global approaches to reducing disasters. Because gender relations structure the lives of both women and men, with differences through the life cycle and across cultures, the work of reducing risk cannot fall to men alone. Indeed, in many parts of the world, women have organized effectively to reduce the risk of natural, human-induced, and technological disasters. But these efforts are not well-known nor are they integrated into mainstream disaster risk reduction programs. The full and equal participation of women and men is needed to mitigate hazards, reduce social vulnerabilities, and rebuild more sustainable, just, and disaster-resilient communities.

Mainstreaming gender equality is urgently needed but implementation of even the most basic change strategies in education, policy, and practice are lacking in most parts of the world, especially with respect to mitigation and the reduction of social vulnerability. In response, this workshop offers practical tools for engendering global responses to hazard, risk, and disaster. Through plenary discussions, video, information exchanges, roundtable discussions, and facilitated workshops, participants will contribute and

benefit from: 1) Dialogue across disciplines, regions, and sectors about empowering women and reducing the risk of disaster; 2) Integrating gender and disaster concerns into parallel dialogues about global development, environmental racism, environmental sustainability, global feminisms, and other social movements for change; 3) Mentoring and networking in support of the next generation of female disaster managers and responders and their male colleagues; 4) Sharing and learning about strategies for transforming organizational culture in disaster management; 5) Practical knowledge of existing gender-sensitive strategies, tools, and resources for promoting awareness, training, and education; 6) Strategies for an integrated approach building gender equality into crisis response and reconstruction; 7) Consultations to design and develop educational resources promoting awareness, training, and education on gender equality and disaster risk reduction; and 8) Developing a framework for continued collaboration. ([www.ssri.hawaii.edu/research/GDWwebsite/](http://www.ssri.hawaii.edu/research/GDWwebsite/))

### **Products or Outcomes**

- Shared tools and increased capacity for gender mainstreaming in disaster risk management organizations.
- A sourcebook of tools and insights to engender disaster management
- A framework for continued collaboration
- Recommendations that can be shared at the ISDR World Conference in 2005 and at Beijing+10 world meetings.

### **Partners**

In addition to sponsors listed above, the invitation is extended for partnerships internationally among agencies and organizations with an interest in reducing the impact of disasters.

### **Start and End Dates**

August 10 to 12, 2004, in Honolulu, Hawai`i



## **Generation of Precipitation and Storm Event Data to Support Hawai'i's Coastal Zone Management Initiative**

### **Project Lead**

Pao-Shin Chu, Hawai'i State Climate Office, Department of Meteorology, School of Ocean and Earth Science and Technology, University of Hawai'i

### **Geographic Area of Interest**

Hawai'i and the Pacific islands

### **Goals/Objectives**

To generate precipitation grids for the Waianae area of O'ahu, Hawai'i, in support of NOAA Coastal Water Quality project.

### **Description**

To compile historical monthly and annual rainfall records from the federal and state gages. To determine storm events from historical meteorological data and weather maps and to extract daily rainfall records during the storm events. Compute and digitize representative values for each storm event.

### **Products**

Digitized annual and monthly precipitation grid point records. Digitized daily precipitation grid point records for storm events.

### **Partners**

NOAA Coastal Services Center, NOAA Pacific Services Center, Hawai'i Coastal Zone Management/Department of Business, Economic Development & Tourism

**Start Date:** 1 March 2004 (expected)

**End Date:** 1 November 2004 (expected)

## **GOES PACIFIC Region, NOAA/NESDIS Office of Satellite Operations (OSO)**

### **Project Lead**

Kathy Kelly

### **Agency/Institution/Organization Acronym**

NOAA/NESDIS/OSO

### **Geographic Area of Interest or Application (region or island)**

Pacific Region

### **Goals/Objectives**

Provide meteorological and environmental data to the Asian-Pacific region in support of the Japanese Meteorological Agency (JMA). Support the Pan-Pacific Education and Communication Experiments by Satellite (PEACESAT) group to provide development and community communications services to the Pacific Islands region.

### **Description**

NOAA/NESDIS Office of Satellite Operations (OSO) provides global environmental data to worldwide user community.

Within the last year, OSO has been providing geo-synchronous meteorological data to the Asian-Pacific region using Geostationary Operational Environmental Satellite (GOES)-9. GOES-9 was transferred to 205 degrees West in December 2002 to support JMA operations in May 2003. GOES-9 provides real-time imaging and sounding data through GVAR (GOES Variable Data Format) and Search and Rescue (SAR). To support this effort a new ground system was installed at OSO's Fairbanks Command Data and Acquisition Site (FCDAS). The satellite is operating nominally but can no longer maintain inclination control due to the amount of fuel remaining on board the spacecraft. The inclination will increase approximately 1 degree per year. In the early spring 2004, GOES-9 will be used to test new ground systems for the Emergency Manager's Weather Information Network (EMWIN-N) in preparation for GOES-N operations. The transition to the new EMWIN capability will be determined by the NWS.

One of our older satellites, GOES-7 located at 175 degrees West, was transferred to PEACESAT, to provide communication services to the Pacific Region. OSO continues to provide engineering services for the operation of GOES-7. Although launched in 1987, GOES-7 is still able to provide communication services. It has an S-Band transponder and a WEFAX transponder. It also has enough fuel remaining to support another 13 years of service. GOES-7 does have limitations: with no batteries, the entire satellite including the communications services is turned off during daily eclipse and is manually turned on during eclipse season; and there is no redundancy in the earth sensor and in the despun platform electronics. The UHF equipment cannot be used as a transponder because there is no direct UHF-to-UHF transponder (uplink is UHF to S-Band and downlink is S-Band to UHF).

To provide a backup capability to the JMA, OSO transferred GOES-8 (formally GOES-East) to 195 degrees West. GOES-8 completed its operational service to NOAA in April 2003. GOES-8 was also considered as a potential replacement for PEACESAT; however, GOES-8 (or any GOES I-M spacecraft)

would require too many resources to maintain it as a communications satellite. To operate the satellite would require 24 hour, 7 days a week operation and a dedicated antenna system for health and safety. Also, tests with the PEACESAT 3 meter antenna did not have good results. Since the transfer, GOES-8 has lost redundancy in the Attitude Orbit Control Electronics (AOCE). To de-orbit, GOES-8 requires one functioning AOCE. It has been decided to de-orbit GOES-8 in July 2004.

**Products or Outcomes**

- GOES-9 will provide Meteorological Imaging and Sounding Data through GVAR.
- GOES-7 continues to provide Pacific Island communications services.
- GOES-8 will be de-orbited in July 2004.

**Partners**

NOAA/NESDIS Office of Satellite Operations continues to partner with the Japanese Meteorological Agency and PEACESAT (University of Hawai'i).

**Start and End Dates**

- GOES-9 started Asian-Pacific coverage in May 2003. It will continue to support until JMA's MTSAT1R is operational.
- GOES-7 launched in 1987 and will continue to support PEACESAT.
- GOES-8 was launched April 1994 and will be de-orbited in July 2004.

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## **Guam Contaminated Site Technical Assistance. NOAA Office of Response and Restoration**

### **Project Lead**

Laurie Sullivan, NOAA Office of Response and Restoration

### **Agency/Institution/Organization Acronym**

OR&R

### **Geographic Area of Interest or Application (region or island)**

Guam

### **Description**

OR&R has assisted the Guam Environmental Protection Agency (EPA) by providing direct technical assistance and support related to environmental impacts of Orote landfill. Specifically, OR&R helped Guam formulate recommendations for an approach to further evaluate the site, provided recommendations for further sampling, and helped support these recommendations to the Navy. Based on the results of the sampling, Guam EPA recommended (released during an August community meeting) the reduction by half of the initial fish consumption advisory area, a reduction that was very helpful to the local community. OR&R is now working to identify acceptable PCB levels in fish for ecological concerns in the Guam environment.

## **Hawai`i's Hazard Mitigation Guidebook for Coastal Development. State of Hawai`i**

### **Project Lead** (3 personnel total)

Dennis Hwang, Author

Dolan Eversole, Workshop Assistant, Erosion Specialist

Sam Lemmo, Workshop Assistant

### **Agency/Institution/Organization Acronym**

Office of Conservation and Coastal Lands (OCCL), State of Hawai`i, Department of Land and Natural Resources (DLNR);

Coastal Zone Management Program, Office of Planning State of Hawai`i; University of Hawai`i Sea Grant; NOAA Pacific Services Center

### **Geographic Area of Interest or Application (region or island)**

State of Hawai`i

Pacific Region

### **Goals/Objectives**

To reduce the risk to coastal development by identifying common hazards and encouraging the coastal development industry to implement higher construction and development standards. A series of workshops will provide an opportunity to introduce the resource management and planning community and general public to the material in the guidebook.

### **Description**

Guidebook produced for the purpose of planning coastal development and construction so that risks from natural hazards such as erosion, flooding, tsunamis, or hurricanes may be reduced. Intended for planners, developers, realtors, homeowners, and the construction industry.

### **Products or Outcomes**

Publication of guidebook, development of digital CD-ROM version. Downloadable version for Web site and workshops to introduce the material.

### **Partners**

OCCL-DLNR

CZM-Office of Planning

University of Hawai`i Sea Grant

NOAA Pacific Services Center and NOAA Coastal Services Center

### **Start and End Dates**

In publication now, workshops ongoing

## **Hawai`i State Hazard Mitigation Plan. University of Hawai`i Social Science Research Institute (UH SSRI)**

### **Project Contact**

Cheryl Anderson, Program Manager  
Eric Yamashita, GIS and Planning Analyst

### **Agency/Institution/Organization Acronym**

University of Hawai`i Social Science Research Institute (UH SSRI) – planners  
Hawai`i State Civil Defense – client and state hazard planning coordination  
Statewide Hazard Mitigation Forum – advisors for the planning process, including the advisory committees for Multi-Hazard Science, Hurricanes, Earthquakes, and Public Education and Awareness.

### **Geographic Area of Interest or Application (region or island)**

State of Hawai`i

### **Goals/Objectives**

To minimize impacts from natural hazards to the State of Hawai`i, with an emphasis on critical facilities and lifelines to protect the people and their economic livelihood in the event of a hazard.

### **Description**

Developing a Hawai`i State Hazard Mitigation Plan to meet federal criteria in the Disaster Mitigation Act of 2000. The foundation of the state plan is formed from the four county plans that include risk and vulnerability assessments and mitigation strategies. State assets, critical facilities, and lifeline connections throughout the state are considered. The Statewide Hazard Mitigation Forum has provided project prioritization.

### **Products or Outcomes**

Hawai`i State Hazard Mitigation Plan, with an identified hazard and risk assessment GIS database and mapping products.

### **Partners**

Multiple – federal, state, county, State Hazard Mitigation Forum

### **Start and End Dates**

In progress. Draft plan should be ready for review in April 2004 with final plan submission to FEMA by July 2004. Documents will be available online at [www.mothernature-hawaii.com/hazmit\\_planning.htm](http://www.mothernature-hawaii.com/hazmit_planning.htm).

## **Height Modernization in the Pacific Islands. NOAA National Geodetic Survey / Pacific Services Center**

**Project Lead:** Edward Carlson, NOAA National Geodetic Survey, Pacific Services Center

**Agency, Institution, Organization Acronym:** NGS, PSC

**Geographic Area of Interest or Application:** Guam, Hawaiian Islands, Pacific Region

**Goals/Objectives:** Height Modernization

**Description:** Height modernization is designed to improve the vertical portion of the National Reference System by using the Global Positioning System (GPS) and leveling to determine heights to support a diversity of GIS, engineering, geophysical, charting, and mapping applications required within the federal and local government agencies, and to support private sector requirements. Accurate heights determined through height modernization will accomplish the following:

- Allow aircraft to land safely in low-visibility conditions
- Alert safety planners to evacuation routes that are slowly sinking and susceptible to flooding
- Provide ships with safer under-keel and overhead clearance to avoid dangerous collisions
- Identify flood-prone areas to guide new construction and reconstruction projects in vulnerable areas
- Allow efficient fertilizer and pesticide use and reduce costs to counter pollution from chemical runoff
- Improve the efficiency and reliability of water delivery systems
- Improve infrastructure monitoring

Height Modernization and Height Modernization activities can be viewed at [www.ngs.noaa.gov](http://www.ngs.noaa.gov).

### **Products of Outcomes**

Provide positional accuracies better than 1 centimeter in the horizontal and 2 centimeter in orthometric height components.

**Potential Project Partners:** NOAA, NOS, NGS, other federal and local government agencies, and the private sector

**Start Date:** March 2003

**End Date:** Ongoing

## **Implement the Saffir-Simpson Tropical Cyclone Scale in Micronesia. Weather Forecast Office Guam**

### **Project Lead**

Chip Guard, Warning Coordination Meteorologist, Weather Forecast Office (WFO) Guam

### **Agency/Institution/Organization Acronym**

WFO Guam

### **Geographic Area of Interest or Application (region or island)**

Republic of Palau, Federated States of Micronesia (Yap, Chuuk, Pohnpei, Kosrae), Republic of the Marshall Islands, Commonwealth of the Northern Mariana Islands, Guam

### **Goals/Objectives**

To introduce and implement the use of the Saffir-Simpson Tropical Cyclone Scale into the U.S.-affiliated islands of the western Pacific. This scale relates maximum tropical cyclone surface winds to potential damage from wind and storm surge to structures, infrastructure, and vegetation.

### **Description**

- The Saffir-Simpson Hurricane Scale has been used for three decades in the Atlantic and Gulf Coast areas to rate the intensity of hurricanes and describe associated damages.
- The Saffir-Simpson Hurricane Scale does not work well in more tropical areas.
- Guard and Lander (1999), after 8 years of study, adapted the scale for use in tropical hurricane- and typhoon-prone areas.
- This Saffir-Simpson Tropical Cyclone Scale considers tropical building materials and practices, tropical vegetation and agriculture, the effects of the reefs on storm surge and inundation, and sub-hurricane (typhoon)-force winds.
- The scale contains two tropical storm categories and five typhoon categories for defined ranges of wind speed.
- The scale will allow decision makers to have an accurate idea of damages from various intensity tropical cyclones. It also allows the assessment of wind strength where there is no wind-measuring equipment or where the equipment was damaged.
- The scale has already been introduced to emergency managers throughout Micronesia. The World Meteorological Organization (WMO) wants to use it in tropical hurricane- and typhoon-prone areas around the world. It is being translated into French.

### **Products or Outcomes**

- A colored handout that summarizes the scale is being prepared.
- National Weather Service typhoon products (Public Advisories and Typhoon Local Statements) will reflect the appropriate tropical storm or typhoon category.
- Some routine products will also refer to the tropical storm or typhoon category.
- Outreach workshops will cover use and interpretation of the scale.

This initiative complements the initiative on the re-evaluation of tropical cyclone watch/warning points.

### **Partners**

Weather Service Offices (WSOs), National Emergency Management Offices, University of Guam, WMO



**Start Date:** 1 June 2004

**End Dates:** Indefinite

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## **Improving the Ability to Capture Threats from Contaminated Sites. NOAA Office of Response and Restoration**

### **Project Lead**

Jill Meyer, NOAA Office of Response and Restoration

### **Agency/Institution/Organization Acronym**

OR&R

### **Geographic Area of Interest or Application (region or island)**

Hawai`i

**Description:** OR&R, with support from the Pacific Services Center, is working with the Hawai`i Department of Health's (DOH) Hazard Evaluation and Emergency Response Office (HEER) to improve the ability to accurately capture the threat that contaminated sites pose to Hawai`i's natural resources and public health. Efforts will explore increasing efficiency of the site prioritization process by using data management techniques and/or GIS analysis. Representatives from OR&R and the Pacific Services Center met with HEER representatives the first week of February to complete a phase assessment of the current HEER database and tracking system. Final recommendations to the HEER office will be delivered in the spring of 2004.

## **Install HURREVAC Software at All Micronesian Emergency Management Offices (EMO). Weather Forecast Office Guam**

### **Project Lead**

Chip Guard, Warning Coordination Meteorologist, Weather Forecast Office (WFO) Guam

### **Agency/Institution/Organization Acronym**

WFO Guam

### **Geographic Area of Interest or Application (region or island)**

Republic of Palau (ROP), Federated States of Micronesia, FSM (States of Yap, Chuuk, Pohnpei, Kosrae), Republic of the Marshall Islands (RMI), Commonwealth of the Northern Mariana Islands (CNMI), Guam

### **Goals/Objectives**

To assist all Micronesian EMOs with installing the latest version of the HURREVAC tropical cyclone plotting and decision-making software. Provide training on how to use the program.

### **Description**

- HURREVAC is a tropical cyclone plotting and decision-making software tool funded by FEMA and the U.S. Army Corps of Engineers (USACE).
- Due to limited band-width capabilities, EMOs have not been able to download the software and documentation. Warning Coordination Meteorologist (WCM) obtained permission from the HURREVAC program manager to put the software and documentation on a CD-ROM and WCM will register the user with the program manager.
- New versions have options to put data in local time for all islands.
- WFO Guam has taken steps to have the Joint Typhoon Warning Center (JTWC) include 65-knot wind radii information in warning messages. This will enable that information to automatically update in HURREVAC.
- WSO meteorologists in charge (MICs) or representatives will assist with training.

### **Products or Outcomes**

- Have each Micronesian EMO with the capability to run HURREVAC by 30 September.
- HURREVAC will be supplied 65-knot wind radii in JTWC warnings.
- EMOs can better respond to tropical cyclones and supply improved support to their islands.

**Partners:** JTWC, FEMA HURREVAC contractor (John Townsend), Micronesian Weather Service Offices (WSOs)

**Start Date:** September 2003

**End Date:** September 2004

## **Integrated Coastal Management (Component of International Waters Programme). South Pacific Regional Environment Programme (SPREP)**

### **Project Lead**

Andrew Wright  
Project Manager, International Waters Project  
South Pacific Regional Environment Programme  
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Web: [www.sprep.org.ws/iwp](http://www.sprep.org.ws/iwp)

### **Agency/Institution/Organization Acronym**

South Pacific Regional Environment Programme (SPREP)

### **Geographic Area of Interest or Application (region or island)**

Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu

### **Goals/Objectives**

To “address root causes of the degradation of international waters in coastal regions through a programme focused on improved integrated coastal and watershed management”

### **Description**

The International Waters Programme (IWP), which began in July 2000, addresses a diverse range of issues, including resource management, conservation, habitat rehabilitation, economic development, policy and planning, and institutional issues, particularly at the community level. The IWP has two main components. The oceanic component focuses on the management and conservation of tuna stocks in the western central Pacific. The coastal component's focus is on integrated coastal watershed management. It involves the implementation of 14 pilot projects that address sustainable resource management and conservation issues in the coastal zone.

The Integrated Coastal Watershed component focuses actions on freshwater supplies, including groundwater, marine protected areas, sustainable coastal fisheries, integrated coastal management planning, including tourism development and activities to promote waste reduction in local communities.

### **Products or Outcomes**

Activities will concentrate on implementing 14 community-based demonstration projects that demonstrate best practices and provide lessons for community-based management of threatened habitats and promote options for the sustainable use of natural resources.

Each project will seek to strengthen capacity and provide lessons for best practice and appropriate methodologies for sustainable resource management and conservation in four focal areas relating to

- Marine protected areas (4 projects);
- Sustainable coastal fisheries (3 projects);
- The protection of freshwater resources (4 projects), and
- Community-based waste reduction (3 projects).

**Partners**

The Global Environment Facility (GEF) , Secretariat for the Pacific Community (SPC) and the Forum Fisheries Agency (FFA), University of the South Pacific (USP), the South Pacific Applied Geosciences Commission (SOPAC) United Nations Development Programme (UNDP) , Forum Secretariat, Governments of Pacific Island Countries

**Start and End Dates**

February 2000 to December 2006

South Pacific Regional Environment Programme (SPREP)

P O Box 240, Apia, Samoa

Tel: +685 21929; Fax: +685 20231

Web site: [www.sprep.org.ws](http://www.sprep.org.ws)

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## **Landslide Inventory and Hazard Maps of Chuuk State in the Federated States of Micronesia. USGS**

**Description:** A landslide hazard map has been prepared for the islands of Chuuk State that were affected by tropical storm Chata'an in July of 2002. The hazard map is based on an inventory of landslides triggered by the rainfall of tropical storm Chata'an, a slope map of the islands affected, and the geology of those islands. A GIS-based landslide susceptibility map is generated using a simple "infinite-slope analysis" that calculates the theoretical stability of each 10-meter cell of slope based on the representative shear-strengths of the geologic units. This susceptibility map is then compared to the actual landslide locations to estimate the spatial landslide probability for each of the cells. Hazard categories are then selected based on these probabilities, and the map is then made depicting the limits of these hazard categories. Because the relocation of people and property from areas of high landslide hazard is not an option in Chuuk due to lack of any public land, attention has been given to defining a "safety" zone for evacuation purposes based on the runout statistics of the debris flows that occurred.

Upon completion of these maps, a return trip was taken to Chuuk and to the Federated States of Micronesia capitol on Pohnpei to brief government agencies and NGOs on proper uses of the hazard map.

Ed Harp, 303 273-8557 or e-mail at [harp@usgs.gov](mailto:harp@usgs.gov)

**The National Map Pilot Projects. USGS (see *.pdf*)**







**The National Map: Topographic Maps for the 21<sup>st</sup> Century. USGS (see *.pdf*)**



**Natural Hazards Initiatives for Pacific Communities. NIWA (see *.pdf*)**



**New Zealand's Natural Hazard Centre (NHC) Activities Brief. NIWA  
(see .pdf)**



## **NOAA CoastWatch – Central Pacific Node**

### **Project Lead**

Dr. Jeffrey Polovina (Principal Investigator)  
Lucas Moxey (CoastWatch Administrator)

### **Agency/Institution/Organization Acronym**

NOAA

### **Geographic Area of Interest or Application (region or island)**

Pacific Basin

### **Goals/Objectives**

To develop and distribute near real-time satellite-derived ocean products to support management, sustainability, and research of living marine resources.

### **Description**

Release of remote sensing products to the public regarding the oceanographic surface processes for the Pacific Ocean.

### **Products or Outcomes**

Satellite remote sensing products:

1. Sea Surface Temperature (AVHRR-HRPT)
2. Sea Surface Temperature (AVHRR-GAC)
3. Sea Surface Temperature (GOES)
4. Ocean Color (Chlorophyll-a) (MODIS Terra/Aqua, SeaWiFS)
5. Ocean Altimetry (Jason-1, TOPEX/Poseidon)
6. Ocean Wind Speed (QuikSCAT)
7. Ocean Wind Stress (QuikSCAT)
8. Ocean Wind Stress Curl (QuikSCAT)
9. Ocean Surface Currents (OSCARs)
10. EOF Indicators (Altimetry)

### **Partners**

University of Hawai'i – Joint Institute of Marine and Atmospheric Science

### **Start and End Dates**

Ongoing



## **NOAA National Coastal Data Development Center (NCDDC) Liaison for Hawai'i and U.S.-Affiliated Pacific Islands**

### **Patrick Caldwell**

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Liaison for Hawai'i and U.S.-affiliated Pacific Islands  
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My position is ongoing and I do not have explicit start and end dates to my duties, which are spread among various activities:

### **I. Serve as a regional contact for the NOAA data centers.**

There are two primary modes: the posterity archive and the NCDDC coastal gateways.

For the posterity archive, the liaison solicits contributions of regional oceanic/coastal measurements from county, state, and federal governmental offices, academia, private consultants, and NGOs. Data received are reviewed and documented with Federal Geographic Data Committee (FGDC) metadata and entered into the posterity archive via the National Oceanographic Data Center (NODC). Regional data accumulated to date can be found at [http://ilikai.soest.hawaii.edu/HILO/data/sort\\_PCID.html](http://ilikai.soest.hawaii.edu/HILO/data/sort_PCID.html)

For the federal hazard mitigation partners (FHMP), these historic data would serve as baseline information.

For the gateways, the liaison seeks out regional Internet-based data repositories for linking into the NCDDC coastal catalog and gateway system ([www.ncddc.noaa.gov](http://www.ncddc.noaa.gov)). This distributed archive would support the FHMP with access to both real time and historic data and products.

### **II. Serve as data manager for the Joint Archive for Sea Level (JASL)**

The JASL is an international archive of research-quality hourly, daily, and monthly sea level data. It is co-located with the University of Hawai'i Sea Level Center, which shares scientific guidance. This repository would serve the FHMP for baseline information. The data are available at <http://ilikai.soest.hawaii.edu/uhsdc/data.html>

### **III. Serve as data manager for the Joint Archive for Shipboard ADCP (JASADCP)**

The JASADCP (<http://ilikai.soest.hawaii.edu/sadcp/>) serves as a repository for calibrated and quality-controlled shipboard ADCP data. The E. Firing ADCP Laboratory at the University of Hawai'i provides scientific overview. The focus is on acquisition and archival of data from U.S. national sources; however the JASADCP is serving as a Data Assembly Center for the World Ocean Circulation Experiment (1995-2002) and the Climate Variability and Predictability Program (2003-), leading to cruises collected by international sources. These data would also be of interest to the FHMP as baseline data.

#### **IV. Make daily surf forecasts**

In collaboration with the National Weather Service (NWS), a surf forecast ([www.prh.noaa.gov/hnl/Products/SRF.php](http://www.prh.noaa.gov/hnl/Products/SRF.php)) is produced Monday through Friday. The surf forecast is an essential element in Hawai'i within the primary NWS mission of protection of life and property from oceanic and atmospheric phenomena. It is also widely used for commercial and recreational nearshore activities.

## **O`ahu Drift Card Study. NOAA Office of Response and Restoration (OR&R)**

**Project Lead:** Glen Watabayashi

### **Agency/Institution/Organization Acronym**

Office of Response and Restoration (OR&R)

NOAA Hazmat

### **Geographic Area of Interest or Application (region or island):**

Hawaiian Islands

### **Goals/Objectives**

The purpose of this study is to learn where floating pollutants might go if released from the south shore of O`ahu. Drift cards are inexpensive and allow us to gather information under a broad range of environmental conditions for a fairly long period of time.

### **Description**

A drift card is a 4"x 6"x 1/8" wooden card painted with non-toxic paint. Released into the ocean, these cards float and are affected by various environmental conditions. Ultimately, the drift cards will biodegrade or get blown ashore by the wind where individuals will find them.

Approximately once a month from fall 2002 to fall 2004, a volunteer team will travel out in between the Chevron and Tesoro mooring buoys that are located approximately one mile offshore of Barber's Point. Each time, the volunteer team will release 100 cards into the water. A total of 2,400 cards will be released during the 2-year period of the study. Like a message in a bottle, the cards ask the finder to contact Hazmat, via e-mail, mail, or Web site to report when and where the card was found. So far, 14 batches have been dropped, with an additional two drops in January and November 2003, because of a Kona wind event. These events, with winds from the south and southwest, usually occur several times during the winter months in Hawai`i, and have the potential of carrying pollutants to the Waikiki and Diamond Head areas. These specific drops are made possible by special notifications from NWS Honolulu. As of January 2004, 147 cards have been returned from the 16 drops.

The information will be used to improve current predictions for floating objects in the Hawaiian Islands.

### **Products or Outcomes**

Better current predictions for oil spill response planning.

### **Partners**

In cooperation with Clean Island Council Spill Response Cooperative, Chevron, Tesoro, NOAA's National Weather Service, and the U.S. Coast Guard

### **Start and End Dates**

Winter 2002 to winter 2004, monthly

## **Pacific Disaster Center (PDC) Activities**

### **Agency, Institution, or Organization**

Pacific Disaster Center

### **Agency, Institution, or Organization Acronym**

PDC

### **Project Lead**

Dr. Allen Clark

### **Mission**

The Pacific Disaster Center's mission is to support the development of more effective policies, institutions, programs, and information products for the disaster management community of the Asia-Pacific region and beyond.

### **Geographic Area of Interest or Application**

Asia Pacific Region

### **Description of current activities (include project acronyms):**

#### *Long-term programs*

Decision and Policy Support  
Institutional Capacity Development  
Risk and Vulnerability  
Humanitarian Assistance Support  
Security and Sustainability

#### *Short-term projects*

DIN – A Distributed Information Network (DIN) supporting Natural Hazard Applications in the Asia-Pacific Region. The DIN will support geospatial information users such as emergency managers, planners, and resource managers, as well as geospatial information producers, including governmental and nongovernmental organizations, and potentially, private-sector firms. It will play a pivotal role in facilitating dissemination of and access to these critical data resources for a wide variety of disaster management activities. The first node in the DIN, PDC's Enterprise Geospatial Database, will come on-line later this spring. Other nodes are anticipated to come on-line throughout the year.

IDSS - The PDC has been supporting institutional and infrastructure development in the Caribbean region leading to the development of an Integrated Decision Support System (IDSS). IDSS has been designed to support planning, preparation, and recovery from regional natural disasters. Sponsored by humanitarian assistance elements of the U.S. Southern Command (USSOUTHCOM), its goal is to establish institutional resources, at the regional and national level, supporting comprehensive emergency management. IDSS is presently hosted at PDC and will transition to USSOUTHCOM by mid-summer.

Hazards Atlas - In support of the needs of regional planning agencies involved in disaster mitigation and preparedness, the PDC has developed a Web-accessible Asia Pacific Natural Hazard and Vulnerability Atlas. The Hazards Atlas provides a venue for decision makers to explore issues related to risk,

vulnerability, and regional impact assessment within a geospatial framework. Version 2.0 of the atlas will include expanded analytical functionality and enhanced data for Hawai'i when it is deployed this spring.

SOPAC/CHARM RVA - As part of South Pacific Applied Geophysical Commission's (SOPAC) Comprehensive Hazard, Risk and Mitigation (CHARM) initiative, this project coordinates the application of PDC's modeling and data resources with the Pacific Marine Environmental Laboratory (PMEL) in the formulation of tsunami inundation products of Port Vila and Mele Bay. These products include inundation maps, damage assessments, and data visualization products. SOPAC funded this project through the World Bank's Catastrophic Insurance Pilot Project.

American Samoa RVA and Mitigation Project – A two-phase effort which lead to a hazard mitigation plan for American Samoa. Phase I developed a comprehensive Natural Hazard Risk and Vulnerability Assessment, to gain an understanding of the risks of natural disasters. Under Phase II, a Mitigation Plan was developed to identify and prioritize mitigation projects.

DPMA – The PDC has been supporting the Disaster Prevention and Mitigation Activity (DPMA). DPMA is a U.S. Army, Pacific (USARPAC), humanitarian assistance/disaster response (HADR) program. The HADR provides a fundamental overview of a nation's vulnerabilities and a review of the national disaster plan. This support has contributed to a more thorough assessment of the resources at risk within the island nations in the Southern Pacific and Indian Oceans. PDC, in collaboration with the Global Center for Disaster Management and Humanitarian Action, has a proposed a capacity development component to this year's DPMA missions through the introduction of an integrated set of training/workshop/collaboration tool activities in conjunction with planned missions.

Regional Exercise Support – PDC provides emergency managers and planners within Hawai'i and throughout Asia-Pacific with collaboration tools and dynamic information products addressing disaster preparedness, response, and recovery phases. Recent and upcoming exercises include Cobra Gold, Blue Pacific, and Makani Pahili.

HAZUS Hazards Atlas – In collaboration with the Hawai'i State Earthquake Advisory Committee (HSEAC) and Hawai'i State Civil Defense (HSCD), the PDC is developing an Internet-based HAZUS Atlas (catalog). The catalog will provide disaster managers with critical information about the potential losses and impacts from historical earthquakes based on the FEMA-developed HAZUS Earthquake Loss model. The catalog will provide disaster managers with easy access to HAZUS loss estimates for more than 20 historical earthquakes, affecting Hawai'i. The catalog will be accessible to disaster managers through the PDC's Emergency Management Operations (EMOPS) Web site, which is password protected.

#### Contact Information

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## **Pacific ENSO Application Center (PEAC) Outreach: Assessment and Development**

### **Project Lead**

LTJG Nicole Colasacco, PEAC Outreach Officer

### **Agency/Institution/Organization Acronym**

PEAC (Pacific ENSO Application Center)

### **Geographic Area of Interest or Application (region or island)**

U.S. Affiliated Pacific Islands (USAPI)

Territory of Guam

Territory of American Samoa

Commonwealth of North Mariana Islands (CNMI)

Federated States of Micronesia (FSM)

Republic of Marshall Islands (RMI)

Republic of Palau

State of Hawai`i

### **Goals/Objectives**

Utilize user input to improve the outreach component of PEAC.

### **Description**

The Pacific ENSO Applications Center (PEAC) is a collaborative effort of the University of Hawai`i, the University of Guam, NOAA, and the Pacific Basin Development Council. The mission of the Pacific ENSO Applications Center is to conduct applied regional climate research and provide regional climate forecasts and information for use in management and planning undertaken in the USAPI (United States-Affiliated Pacific Islands) in such climate-sensitive sectors as water resource management, fisheries management, agriculture, civil defense, power utilities, coastal zone management, etc. Currently, this is conducted through the PEAC newsletter, *Pacific ENSO Update*, the PEAC Web site, and local meetings and workshops.

PEAC is in a transition period from a research pilot project to an operational status under the National Weather Service – Pacific Region. During this period, a comprehensive review of the PEAC program is being conducted by Eileen Shea of the East-West Center. One of the objectives of this review is to provide PEAC with input from PEAC users, scientists, and forecasters. PEAC plans to use the results of the surveys, interviews, and workshops to improve the current outreach program.

### **Products or Outcomes**

- Improve the PEAC newsletter, the *Pacific ENSO Update*, and the PEAC Web site (<http://lumahai.soest.hawaii.edu/Enso/index.html>) by implementing the results of the PEAC survey and PEAC review workshop (1-3 June 2004).
- Incorporate other suggestions of the PEAC survey and review workshop into PEAC's outreach program.
- Investigate other methods of disseminating climate information and educating climate-sensitive sectors of the USAPI.

- Develop and strengthen partnerships with regional organizations that have complementary objectives.

**Partners**

University of Hawai`i

- JIMAR – Joint Institute for Marine and Atmospheric Research
- SSRI – Social Science Research Institute

NOAA

- National Weather Service – Pacific Region

UOG/WERI

- University of Guam – Water and Energy Research Institute

PBDC

- Pacific Basin Development Council

**Start and End Dates:** January 2004 to ??

## **Pacific Islands Global Climate Observing Systems (PI-GCOS). South Pacific Regional Environment Programme (SPREP)**

**Project Lead:** Mark Morrissey, PI-GCOS Officer

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### **Agency/Institution/Organization Acronym**

South Pacific Regional Environment Programme (SPREP)

### **Geographic Area of Interest or Application (region or island)**

Pacific Region

### **Goals/Objectives**

To coordinate and provide advocacy in the region to implement activities related to the PI-GCOS goals.

### **Description**

The primary objective of PI-GCOS is to significantly enhance the number and quality of climate observations in the Pacific region. It has been long recognized that the achievement of this objective requires a significant effort on both developed and developing Pacific regional countries to enhance the capacity of island meteorological, hydrological, and other related environmental island governmental organizations. Most importantly, the resulting enhancement of this capacity must be sustainable, which requires significant effort and a strong sense of "ownership" of the PI-GCOS by the individual Pacific Island countries.

### **Products or Outcomes**

A significant enhancement of the current Pacific Island climate-observing network through sustainable capacity building of Pacific Island, environmentally related, governmental organizations.

### **Partners**

The World Meteorological Organization, the Australian Bureau of Meteorology, The U.S. National Weather Service (NOAA), the New Zealand National Institute for Water and Atmospheric Research, SOPAC, SPREP, the East-West Center (University of Hawai'i), Pacific Island governments.

South Pacific Regional Environment Programme (SPREP)

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## **Pacific Island Land Ocean Typhoon Experiment (PILOT). Coastal and Hydraulics Lab, Engineering Research and Development Center (ERDC), U.S. Army Corps of Engineers**

### **Project Lead**

Dr. Andrew Garcia and Mr. Stanley Boc

### **Agency/Institution/Organization Acronym**

Coastal and Hydraulics Lab, Engineering Research and Development Center (ERDC), U.S. Army Corps of Engineers

### **Geographic Area of Interest or Application (region or island)**

Pacific Islands

### **Goals/Objectives/Description**

Studies of methods to protect U.S. populations from the effects of landfalling tropical cyclones have been confined primarily to the continental United States. These studies have emphasized evacuation of large populations from coastal areas as a primary mitigation measure against the effects of coastal storm surge and maximum cyclonic winds. The concept of evacuation as a viable mitigation tool assumes a supporting infrastructure far enough removed from the landfall location to accommodate the evacuating populace, a road system that permits timely evacuation, and an effective emergency management system in place to control and conduct an orderly evacuation.

The methods used to protect mainland populations from cyclone effects may not be appropriate or effective in island environments. If no inland infrastructure exists that offers refuge from the cyclone effects, evacuation is not a viable option for the local populace. Moreover, cyclone effects that are of little or no concern to mainland residents may pose significant hazards in island environments. These effects can include terrain enhanced winds, elevated coastal water levels caused by wave-induced ponding on reefs, and mudslides caused by heavy rains. In contrast to mainland tropical cyclone hazard scenarios, which have been extensively studied and where mature emergency management measures are in place, island hazard scenarios have received little attention.

Adequate data exist to quantitatively depict some of the various geophysical processes occurring during cyclone landfall in islands (e.g., spectral wave transformation, coastal surge) such that competent models of these processes are available. However, data depicting other processes (e.g., wave-induced ponding, wind-forced wave uprush) are inadequate or do not exist, consequently the physics of these processes are poorly understood and adequate models are not available. Data of adequate quantity and quality depicting the physics of these processes are required to develop these models.

To acquire the data necessary to depict and better understand the physics of above-mentioned processes, a field laboratory will be established on the island of Guam. Guam was selected primarily because it is affected by an average of three tropical cyclones annually. In addition, it offers a favorable physical and logistical setting to study the required processes. Initial plans include establishing a nearby deep-water directional wave buoy, a coastal water-level and meteorological station, and shallow water wave gages nearshore and in a reef-rimmed lagoon, and performing a laser-based bathymetric survey.

Longer-term goals include establishing, via partnership, a high-density anemometer and rain gage network to acquire data on terrain-enhanced winds and precipitation respectively, and Doppler-radar-derived low-level winds. A local stream-gage network to measure cyclone-generated streamflow is also a high-priority goal. The USACE intends to provide the basic infrastructure and administrative framework for the PILOT experiment, and seeks partners who have complementary interests and goals in order to develop a synergistic research environment for mutual benefit.

**Products or Outcomes:** Product from the PILOT experiment will be typhoon-produced water level and wave data set(s) that will be used to upgrade existing model suites for hurricane/typhoon inundation and for the development of the next generation models.

**Partners:** National Weather Service, Air Force, State of Hawai'i, and Territory of Guam.

**Start and End Dates:** Started fiscal year 2003 and scheduled for a 5-year program.

## **Pacific Ocean Pollution Prevention Programme (PACPOL)**

### **Program Lead**

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Ph (685) 21929; Fx (685) 20231; e-mail: [sefanaian@sprep.org.ws](mailto:sefanaian@sprep.org.ws)

### **Agency/Institution/Organization Acronym**

South Pacific Regional Environment Programme (SPREP)

### **Geographic Area of Interest or Application (region or island)**

Pacific Islands Region

### **Goals/Objectives**

To minimize and manage the shipping-related marine pollution in the Pacific Islands region.

5 focal areas:

Marine Spills  
Ships Waste Management  
Port Operations  
Invasive marine Species  
WWII Wrecks

### **Description**

PACPOL is a joint SPREP/ International Maritime Organization (IMO) programme aimed at addressing shipping-related issues. It focuses on enabling members to meet their obligations under various global and regional legal instruments on marine environment protection. Programme outputs focus on providing the necessary tools for member governments to provide the legal, policy, and institutional framework to implement activities and guidance on how these activities are to be implemented

### **Products or Outcomes**

Regional Marine Spills Risk Assessment (Regional/National/Port level)  
Pacific Islands Regional Marine Spill Contingency Plan (PACPLAN)  
National Marine Spill Contingency Plan (NATPLAN) template  
Model "Marine Pollution Prevention Act"  
Regional Ships' Waste Management Strategy  
Regional Guidelines for the Environmental Management of Ports (including port contingency plans)  
Regional Strategy to Address Marine Invasive Species  
Data compilation of ship wrecks incorporated into GIS  
Regional Strategy to Address Marine Pollution from World War II Wrecks

### **Partners**

IMO, Government of Canada, Commonwealth Secretariat (COMSEC), member governments, Association of Pacific Ports, oil industry, fishing industry

**Start and End Dates:** Start 1998; End 2005 (current work programme)

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## Pacific Resources for Education and Learning (PREL) Service Centers

Entity (Location)	PREL Staff	Service Center Funding Focus	PREL Video Conferencing Centers
American Samoa (Pago Pago)	2 Program Staff	Pacific CHILD early reading improvement research project	<ul style="list-style-type: none"> <li>▪ American Samoa DOE office</li> <li>▪ 20 public school sites</li> <li>▪ LBJ Hospital</li> <li>▪ American Samoa Community College</li> </ul>
Chuuk (Weno)	3 Program Staff 1 Support Staff	Pacific Parental Information Resource Center; Pacific CHILD early reading improvement research project	Chuuk DOE Conference Room
CNMI (Saipan)	2 Program Staff 1 Support Staff	Pacific CHILD early reading improvement research project	<ul style="list-style-type: none"> <li>◇ CNMI PSS Central Office</li> <li>▪ All public schools</li> <li>▪ PREL CNMI Service Center</li> </ul>
Guam (Hagatna)	1 Program Staff 1 Support Staff	Math/Science Consortium	<ul style="list-style-type: none"> <li>▪ Guam DOE Central Curriculum Offices</li> <li>▪ 20 public school sites</li> <li>▪ PEACESAT at the University of Guam</li> <li>▪ PREL Guam Service Center</li> </ul>
Kosrae	2 Program Staff	Pacific CHILD early reading improvement research project	Kosrae DOE 2 <sup>nd</sup> Floor Conference Room
Palau (Koror)	2 Program Staff	Pacific Regional Technology in Education Consortium; Pacific CHILD early reading improvement research project	Palau MOE Conference Room
Pohnpei (Kolonia)	3 Program Staff 1 Support Staff	Pacific Parental Information Resource Center; Pacific CHILD early reading improvement research project	<ul style="list-style-type: none"> <li>▪ College of Micronesia</li> <li>▪ Pohnpei Hospital</li> </ul>
RMI (Majuro)	2 Program Staff 1 Support Staff	Pacific Parental Information Resource Center; Pacific CHILD early reading improvement research project	<ul style="list-style-type: none"> <li>▪ College of the Marshall Islands Tech Center</li> <li>▪ PREL RMI Service Center</li> </ul>
Yap (Colonia)	2 Program Staff	Math/Science Consortium; Pacific CHILD early reading improvement research project	Yap DOE Media Center

**The Pacific Comprehensive Regional Assistance Center (Pacific Center)**

The Pacific Center provides comprehensive training and technical assistance to recipients of the U.S. Department of Education's Office of Elementary and Secondary Education (OESE) funding. Services include coordinating and implementing school reform programs; adapting and implementing research-based promising practices for improving teaching and learning; and administering OESE programs.

**The Pacific Mathematics and Science Regional Consortium**

The consortium supports improved student achievement in mathematics and science, especially in high-poverty schools serving under represented populations. The consortium provides research-based technical assistance in strategic planning and professional development, and works with teachers and administrators to identify and implement challenging, standards-based curricula. Sustainable programs are developed by applying the best in current research to the design and delivery of services in local contexts. Progress is determined by and supported through assessments with measurable performance indicators and ongoing data analysis.

**The Pacific Regional Technology in Education Consortium (PR\*TEC)**

PR\*TEC enhances and builds local school and community capacity to acquire and effectively utilize technologies to improve teaching and learning. The program promotes these objectives through four activity areas: professional development, technical assistance, adult education, and information dissemination.

**Videoconferencing: PEACESAT and PREL**

The partnership between PREL and PEACESAT has provided the ten entities that PREL serves with videoconferencing capabilities. In addition to connecting to each other and PREL Honolulu, the systems can also connect to any other videoconference site in the world. Although the system is operational today there are still refinements to be made. For example, more equipment is needed so that Telehealth can share in videoconferencing. Other grants are being sought to provide funding for more equipment and maintenance of the sites. PREL has shared its network with other non-profit agencies at a minimal cost.

**Contact Information**

For more information about PREL's products, services, and programs, contact:

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## **Partnering to Mitigate Coastal Hazards. Hawai`i Coastal Zone Management Program**

### **Project Lead**

Ann Ogata-Deal, Hawai`i Coastal Zone Management Program

### **Agency/Institution/Organization Acronym**

CZM Hawai`i

### **Geographic Area of Interest or Application (region or island)**

State of Hawai`i

### **Goals/Objectives**

Support the timely development and implementation of state and county hazard mitigation strategies.

### **Description**

As a network program, support the state and the counties in development and implementation of their multihazard mitigation plans, including the following:

- Provide planning and/or funding support to each of the four counties to develop and implement their multihazard mitigation plan.
- Provide planning support to State Civil Defense in development of lava flow hazard mitigation plan.
- Provide planning and funding support to the County of Hawai`i in implementation of recommendations of the lava flow hazard mitigation plan.
- Provide planning and funding support to projects of the Statewide Hazard Mitigation Forum, the Hawai`i State Earthquake Advisory Committee, and the Tsunami Technical Review Committee.
- Provide multihazard mitigation training to coastal planners, emergency managers, businesses, visitor and health industries, communities, government agencies, and decision makers.
- Develop and distribute educational materials to the public on preparing for natural disasters.

### **Products or Outcomes**

- Timely completion and FEMA approval of state and county multihazard mitigation strategies.
- Timely implementation of multihazard mitigation strategies leading to a disaster-ready community.
- Better understanding by stakeholders and the general public regarding natural hazards and how to prepare for them.

### **Partners**

State Civil Defense, Department of Business, Economic Development & Tourism/Office of Planning, O`ahu Civil Defense Agency, County of Hawai`i Civil Defense Agency, County of Hawai`i Planning Department, County of Kaua`i Civil Defense Agency, County of Maui Civil Defense Agency, NOAA Coastal Services Center, NOAA Pacific Services Center, International Tsunami Information Centre, Hawai`i Volcanoes Observatory, University of Hawai`i-Hilo Center for the Study of Active Volcanoes.

**Start Date:** July 1, 2001

**End Date:** Ongoing

## **A PC-Based, Web-Interfaced, High-Resolution Ocean Prediction System for Hawaiian Waters. Scientific Solutions, Inc.**

### **Project Lead**

James K. Lewis, Scientific Solutions, Inc.

### **Agency/Institution/Organization Acronym: SSI**

### **Geographic Area of Interest or Application**

Waters Surrounding the Inhabited Islands of the Hawaiian Archipelago

### **Goals/Objectives**

Develop an automated ocean analysis, prediction, and archiving system that can be utilized for government and civilian needs relating to ocean processes and anticipated ocean conditions.

### **Description**

For Navy-related work, SSI developed an ocean prediction system for the waters surrounding Kaua'i/Ni'ihau and O'ahu. Requirements necessitated an automated system running 24/7 and producing predicted fields every day. The system utilizes state-of-the-art, dynamic, ocean circulation and surface wave models with high-resolution grids (900 m to 3000 m horizontally and 28 levels in the vertical with vertical resolutions as low as 2 m). Analysis fields for forcing the models are downloaded every night, and forecast products are posted to the Web every day ([www.hawaii.scisol.com](http://www.hawaii.scisol.com)).

At this time, the Web site products are graphical in nature. Some 30-35 megabytes of graphics are downloaded every day by users, with a growing number of users other than the Navy. All model results are archived each day, resulting in a developing physically-sound database for three-dimensional fields of water temperatures, salinities, and currents, as well as two-dimensional fields of wave characteristics and sea level.

### **Products or Outcomes**

Products from the archives and the daily predictions include current patterns, temperature variations, surface wave magnitudes and patterns, and wave energy dissipation characteristics. These can provide valuable information for hazard mitigation planning, real-time estimates of pollutant dispersal, and search and rescue operations. In addition, coastal engineering and development programs would benefit from the archived information.

Required tasks include a means of linking these databases to potential users. Moreover, we still need to acquire resources to develop, implement, and test domains for Maui and Hawai'i counties so that the waters of all the major Hawaiian Islands are included in the ocean prediction system.

**Partners:** The Office of Naval Research and the Center of Excellence for Research in Ocean Sciences have funded the development of the prediction system. Scientific Solutions, Inc., is supporting the maintenance, continued production, and distribution of products of the Web site.

**Start and End Dates:** This is an ongoing project.



## **Radio and Internet Technology for Communication with Remote Locations in the Pacific (RANET – Pacific). MetService New Zealand Ltd.**

### **Project Lead**

Garry Clarke, International Operations Manager, MetService New Zealand Ltd.

### **Agency/Institution/Organization Acronym**

MetService

### **Geographic Area of Interest or Application**

South Pacific Region

### **Goals/Objectives**

To make weather, climate, and related information more accessible to remote and resource poor populations to aid day-to-day decisions and prepare against natural hazards.

### **Description**

RANET-Pacific will link remote locations in the Pacific with the Small Island Developing States Network (SIDSnet) project. This project aims to duplicate the success of the RANET project for Africa, which used satellite data transmission, wind-up radios (no batteries, no electricity), solar-powered computers, and desktop radio transmitters. RANET-Africa has been providing vital weather, water, and climate information to remote villages in Africa and has had a positive impact on agricultural production, as well as improved use of available freshwater.

The principal objective of this project is to make weather, climate, and related sustainable development information drawn from the Barbados Programme of Action (BPoA) more accessible to remote communities. This information will assist them in making resource decisions and prepare against natural disasters.

RANET-Pacific will employ innovative technologies in sustainable applications and partnerships at the community level to ensure that the networks created serve the entire household information needs. The project will build on the experiences of SIDSnet and RANET-Africa.

The project is designed for 16 Pacific SIDS, but will start with the most underserved communities. The project team, in consultation with regional organizations (SPREP, FORSEC, SPC, SOPAC, and USP), will identify these remote communities. Subsequently, the team will consult with these communities on their needs, translating these needs into tangible actions.

The consortium that comprises RANET is a varied list of organizations that believe that environmental information, while not a panacea to the numerous challenges that face many communities, is nonetheless a vital component of any sustainable development strategy.

RANET activities include training, pilot activities to demonstrate various community technologies, and development of a dissemination network through partnership and platform development.

During the implementation, RANET-Pacific will explore and apply new energy solutions that enable the use of computers and radios in the most remote locations.

**Products or Outcomes:**

- Two RANET Pacific demonstration sites in Niue and Vanuatu successfully installed and meeting the information needs of the remote communities.
- Training Workshops for participants representing all stakeholders in the project completed successfully.
- Better access to meteorological and climatological information for the remote communities.
- Better access to environmental information.
- Better access to disaster preparedness information.
- Better resource decisions and preparations against natural disasters.
- Better access to sustainable development information.
- Plan completed for future development and expansion of RANET Pacific within country and into other South Pacific States.

**Partners:** NOAA Office of Global Programs (OGP), African Centre of Meteorological Applications for Development (ACMAD), UN SIDS Unit/Department of Economic and Social Affairs (DESA), SIDSNet, SPREP, Niue Government, Vanuatu Government, Niue Meteorological Service, Vanuatu Meteorological Service.

**Potential Partners:** Pacific Islands Forum Secretariat (FORSEC), Secretariat of the Pacific Community (SPC), SOPAC, USP, Peace Corps, NZAID, AusAID, UNICEF, Red Cross/Red Crescent, People First Network (PFNet), and other government and nongovernmental agencies in Niue and Vanuatu.

**Start and End Dates:** February 1, 2004, to December 31, 2004. (Phase 1).

## **Reducing the Effects of Contaminants on Fish and Wildlife Resulting from Oil and Chemical Spills. U.S. Fish and Wildlife Service (USFWS)**

### **Project Lead**

Chief, Branch of Environmental Contaminants, U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai'i

### **Agency/Institution/Organization Acronym**

Department of the Interior, U.S. Fish and Wildlife Service (USFWS)

### **Geographic Area of Interest or Application (region or island)**

Hawai'i, Guam, Commonwealth of the Northern Mariana Islands (CNMI), American Samoa, and former affiliated Trust territories

### **Goals/Objectives**

Promote early planning and cooperation at the local, regional, and national level to minimize injury to fish, wildlife, and sensitive habitats from chemical and oil spills, and assist with cleanup, wildlife rehabilitation and habitat restoration at hazardous waste and oil spill sites.

### **Description**

- Oil and Chemical Spill Response training of USFWS personnel and other agencies and partners in the Pacific Islands.
- Hazardous Waste Operations and Emergency Response (HAZWOPER) training.
- HAZWOPER Instructor Training.
- Natural Resource Damage Assessment and Restoration (NRDAR) training.
- Participation in oil and chemical spill drills with other agencies.
- Wildlife and plant surveys and monitoring of effects of oil and chemical spills on wildlife and plant resources.

### **Products or Outcomes**

- Maintenance of a ready source of fully trained and prepared USFWS personnel and other Pacific Island partners to respond to oil and chemical spill emergencies in the marine and terrestrial environment and minimize effects of such spills on natural resources.
- Restoration of damaged natural resources through adequate and thorough follow-up to oil and chemical spill events and coordination with responsible parties.

**Partners:** NOAA, U.S. Coast Guard, Department of Defense, Environmental Protection Agency, National Park Service, Hawai'i Department of Land and Natural Resources, Hawai'i Department of Health, Guam Division of Aquatic and Wildlife Resources, CNMI Division of Fish and Wildlife, American Samoa Department of Marine and Wildlife Resources, City and County agencies, Clean Islands Council, various private companies.

**Start and End Dates:** Ongoing

## **Re-Evaluation of Tropical Cyclone Watch/Warning Points for Micronesia. Weather Forecast Office Guam**

### **Project Lead**

Chip Guard, WCM Weather Forecast Office (WFO) Guam

### **Agency/Institution/Organization Acronym**

WFO Guam

### **Geographic Area of Interest or Application (region or island)**

Republic of Palau, Federated States of Micronesia (Yap, Chuuk, Pohnpei, Kosrae), Republic of the Marshall Islands, Commonwealth of the Northern Mariana Islands, Guam.

### **Goals/Objectives**

To re-evaluate the tropical cyclone watch/warning-point needs of the U.S.-affiliated islands of Micronesia, and make changes as necessary; eliminate watch/warning points for unpopulated islands.

### **Description**

- Joint initiative of WFO Guam, Micronesian WSOs, and Emergency Management Offices (EMOs).
- Will determine new watch/warning point requirements.
- Will eliminate watch/warning points for unpopulated islands.
- Will identify equipment needed for watch/warning verification.

### **Products or Outcomes**

- Will eliminate Sorol Atoll (Yap State, FSM) and Ujelang Atoll (RMI).
- Will add warning points: Fais and Faraulap (Yap State, FSM); Ulul (Namanuito Atoll), Fananu (Hall Islands), Losap (Upper Mortlocks) (Chuuk State, FSM); Pakin Atoll, Sapuatik Atoll, and Lukonor Atoll (Pohnpei State, FSM); Ujae Atoll (RMI).
- Acquisition of meteorological equipment for verification of watches and warnings.

Procedures have been implemented for the needed changes to become effective by 1 June 2004.

**Partners:** NWS Pacific Region Headquarters, Micronesian WSOs, Micronesian EMOs

**Start Date:** 1 November 2003

**End Dates:** 1 June 2004 for warning points; equipment TBD

## **Remote Sites Satellite and Internet Connectivity for Meteorological Communications Networks. Networking Services, and Australian Bureau of Meteorology**

### **Project Lead**

Bryan Hodge, Networking Services, and Australian Bureau of Meteorology (BOM)

### **Agency/Institution/Organization Acronym**

ABOM

### **Geographic Area of Interest or Application (region or island)**

WMO Region 5, Australian Territorial Islands, remote mainland communities, and Antarctica.

### **Goals/Objectives**

To extend meteorological communications networks to remote sites providing 2-way communications with low ongoing costs.

### **Description**

Investigation and implementation of a variety of methods to deliver meteorological data to BOM's remotest sites and also extend these solutions into WMO Region 5 if possible.

Components of this project include:

- Network tunneling through consumer (Internet) satellite networks.
- Encryption technologies and their suitability for meteorological networks.
- Use of Dial up and ADSL technologies.
- Corporate network extension through the Internet.
- GTS hub extension.
- Voice connections over slow speed internet links.
- Maintaining communications integrity over poor and unreliable links.
- Local data collection networks and connectivity to international meteorological networks.
- Use of multicasting to reduce bandwidth requirements

### **Products or Outcomes**

- Use of consumer technology and consumer market costs enabling new sites to be connected to meteorological networks.
- Two-way communications to sites that could otherwise "receive only."
- Better connection of local networks, automated services, and radio networks.
- Better ability to deliver meteorological forecasting tool to sites otherwise restricted by cost.
- Use of new technologies to provide backup links for established communications circuits.

### **Potential Partners**

All region 5 WMO partners, NOAA, Australian Antarctic Division, Optus/Singtel, RANET partners

**Start Dates:** January 2001

**End Date:** Ongoing

## **Science of Oil Spills and Damage Assessment Workshop. NOAA Office of Response and Restoration (OR&R)**

### **Project Lead**

Ruth Yender, Scientific Support Coordinator

### **Agency/Institution/Organization Acronym**

Office of Response and Restoration (OR&R), NOAA Hazmat

### **Geographic Area of Interest or Application (region or island)**

U.S. Flag Pacific Islands and Freely Associated States

### **Goals/Objectives**

Science of Oil Spills Workshops (SOS) are designed to help both new and experienced spill responders understand the complex, interrelated issues that decision makers face during oil spill incidents.

### **Description**

The NOAA Pacific Services Center (PSC), in partnership with NOAA's Office of Response and Restoration (OR&R) and NOAA's Coral Reef Conservation Program, hosted an introductory science of oil spills and vessel grounding damage assessment/salvage training course in Guam, March 8 to 12, 2004. Representatives from the U.S. Coast Guard (USCG), Department of Defense, U.S. Pacific Territories response and natural resource agencies, and Freely Associated States attended. The course was implemented through both classroom lectures and field exercises. General topics covered in this course include the following:

- Overview of oil movement and weathering
- Response alternatives in coral & other tropical habitats
- Shoreline and open water oiling and cleanup
- Natural resource damage assessment following vessel groundings
- Vessel salvage assessment planning and implementation
- Dispersants, bioremediation, and other ways to minimize environmental damage
- Spill case studies
- NOAA-developed software tools for spills.

### **Products or Outcomes**

Introduces local, state, federal, and industry responders and managers to the science relating to oil spilled in the environment.

### **Partners**

Attendees include representatives of territorial government agencies from Guam, Commonwealth of the Northern Mariana Islands (CNMI), American Samoa, and Yap. Also Guam USCG, Navy, (and one oil spill response organization [OSRO] rep). This course is sponsored by the NOAA Pacific Services Center.

### **Start and End Dates**

March 2004

## Sea-Level Variability and Predictability – U.S.-Affiliated Pacific Islands

### Project Lead

Research Scientist: Dr. M. Rashed Chowdhury, PI: Dr. Thomas Schroeder

### Agency/Institution/Organization Acronym

Pacific ENSO Applications Center (PEAC), University of Hawai'i, Joint Institute for Marine and Atmospheric Research, NOAA National Weather Service

### Geographic Area of Interest or Application (region or island)

U.S.-affiliated Pacific Islands (UAPI): American Samoa, Guam, Micronesia, Palau, and Marshall Islands

### Goals/Objectives

At present, the U.S.-affiliated Pacific Islands (UAPI) (American Samoa, Guam, Micronesia, Palau, and Marshall Islands) are provided with an advance seasonal climate outlook, which is based on ENSO (El Niño – Southern Oscillation). This information is contributing significantly to hazards preparedness actions in these Islands. It is, however, observed that there is a demand for forecasting lead-time of 'sea-level variability' for a season or so.

The primary objective of this research is to study the variability and predictability of sea-level in these islands from the coupled oceanic and atmospheric variation, as revealed by large-scale predictors for the climate across the Ocean.

### Description

Probabilistic forecast of climate variability raises issues of both academic and public interest. The present study arises from a real world problem and thus is not solely of academic value but aims to bridge theory and application. This research is aimed at providing a basis for the development of a seasonal outlook for the extent of "sea-level variability" (henceforth, SL) in the U.S.-affiliated Pacific Islands (henceforth, UAPI).

Objectives are as follows:

1. Identification of the oceanic and atmospheric variation of large-scale climate predictors and patterns in the tropical oceans (especially the tropical Pacific);
2. Study the General Circulation Models (GCM) precipitation prediction fields, that is, the response of a physical/dynamical climate model to forcing from the prevailing sea surface temperature (SST) patterns in each year.

The intention is to identify the nature and strength of possible teleconnections (correlation) between the "sea-level variability" and the tropical SSTs and GCM precipitations (*ECHAM is a comprehensive general circulation model of the atmosphere, and the model has been developed from the European Center for Medium-Range Weather Forecasts, or ECMWF, model*) and to develop a statistical model that can capture the natural variability of sea-level, quantifying the skill at a long-lead time of several months.

### Products or Outcomes

- A. *Variability and Predictability from the Tropical SST*: This will provide predictors available in early January from the leading PCs (Principal Components) of SST, which could be used to provide a first indication of SL to expect in the coming monsoon season. Further improvements with good

skill with a lead-time of a month could be observed in July. Finally, the highest prediction skills could be obtained in the month of August.

- B. *Variability and Predictability from the GCM Precipitation*: This will provide SL variability and predictability from the *leading PCs* of ECHAM precipitation.

**Start and End Dates**

December 2003 to November 2004



## **Spatial Data Development for Coastal and Natural Resource Managers in the U.S. Flag Pacific Islands. NOAA Pacific Services Center**

### **Project Lead**

Darcee Killpack, Spatial Technology Coordinator, NOAA Pacific Services Center

### **Geographic Area of Interest or Application (region or island)**

U.S. Flag Pacific Islands

### **Goals/Objectives**

The project will continue to compile and disseminate information about NOS, and when possible NOAA, mapping activities in the Pacific. It will also build a geospatial network of mapping professionals to further the collection and dissemination of spatial data in the Pacific Islands.

### **Description**

There are numerous federal, state, and territory mapping activities being conducted or planned in the Pacific Islands. PSC can help to coordinate and disseminate this information to coastal managers as much as possible. Because of the remote locations of these islands, costs for creating spatial data are high. Therefore, any opportunity to pool resources and learn about current activities from other organizations is important to the success of data collection activities. It is important to leverage opportunities to collect spatial data, provide training, and build local capacity within the Pacific Islands.

PSC is supporting numerous data collection efforts through coordination, funding, and/or local technical support. Three efforts that PSC is involved in, highlighted below, should be completed in 2004. Other activities being coordinated in the Pacific are acquiring QuickBird satellite imagery for the Pacific islands, acquiring IKONOS satellite imagery for Hawai'i through the Hawai'i IKONOS consortium, and, through NOAA's continual efforts, mapping shallow-water benthic habitats in the Pacific and Hawai'i using satellite imagery (especially IKONOS).

NOAA, through PSC and the NOAA Coastal Services Center, is funding the acquisition of Light Detection and Ranging (LIDAR) data for the entire island of O`ahu at 4-meter postings and the Lahaina area of West Maui at a 2-meter posting. With a 4-meter posting, users will be able to produce a 4-meter Digital Elevation Model that has vertical measurement accuracy around 15 to 30 centimeters. These data are being collected as part of a grant to the State of Hawai'i Office of Planning and other NOAA initiatives, and will be available to the public through an Internet data server.

USGS, in cooperation with PSC, is creating base data products for the 10 Northern CNMI islands. IKONOS imagery was collected in 2003, and the National Geodetic Survey, with support from the CNMI government, traveled to the islands in the summer of 2003 to collect ground control points to register the imagery to the North American Datum of 1983. USGS is using this imagery, in conjunction with National Geospatial-Intelligence Agency (NGA) data, to create new topographic maps, digital elevation models, and digital line graphs for the northern islands. PSC will also work with the NOAA Office of Coast Survey to use these data sets to begin the process of repositioning the NOAA nautical charts.

PSC is also helping the islands in the development of hazard mitigation data inventory templates. These

templates provide emergency planners in the Pacific Islands with a list of spatial data sets that need to be considered during hazard mitigation planning, and they assist in the collection and organization of these spatial data layers. The template structure addresses specific Pacific Island concerns and fits within the hazard mitigation framework provided by the Department of Homeland Security (DHS). The template is in the form of a digital database with fields for tracking data mining and collection activities.

**Products or Outcomes**

A greater amount of spatial data made available to Pacific Island coastal resource community.

**Partners**

U.S. Geological Survey, U.S. Fish and Wildlife Service, U.S. Natural Resources Conservation Service, National Park Service, U.S. Forest Service, Federal Emergency Management Agency, Department of Homeland Security

State of Hawai'i Office of Planning, State of Hawai'i Coastal Zone Management, City and County of Honolulu, County of Maui, County of Hawai'i, Hawai'i Natural Heritage Program, CNMI Coastal Resources Management Office, Northern Mariana Community College, American Samoa Coastal Management Program, American Samoa Community College, Guam Coastal Management Program, Guam Civil Defense, Guam Bureau of Statistics and Plans, University of Guam Marine Laboratory

**Start and End Dates**

The LIDAR data collection started in October 2003 and will continue until the end of 2004.

The Northern CNMI data products were started in October 2003 and should be completed by September 2004.

## **State of Hawai`i Hazard Mitigation Public Awareness and Education Campaign. UH Social Science Research Institute (SSRI)**

### **Project Lead**

Cheryl Anderson, Program Manager

### **Agency/Institution/Organization Acronym**

UH Social Science Research Institute (SSRI) with the Statewide Hazard Mitigation Forum and their Public Awareness and Education subcommittee. The client and coordinator of this project is Hawai`i State Civil Defense.

### **Geographic Area of Interest or Application (region or island)**

State of Hawai`i, with particular focus on counties. May provide some useful information for other islands.

### **Goals/Objectives**

Improve and update hazard mitigation information for the general public, with specific information for individuals, for businesses, and for communities engaging in mitigation planning.

### **Description**

The project uses information dissemination through the Internet and the public libraries to improve awareness. Available at [www.mothenature-hawaii.com](http://www.mothenature-hawaii.com).

### **Products or Outcomes**

- Kaua`i “Natural Hazard Risk and Vulnerability Assessment and Mitigation Planning Workbook” – county and community “how-to” guide based on Kaua`i’s planning experience.
- County Mitigation Strategies – shared for review by other regions. Information will be updated based on current hazard mitigation planning processes.
- Actions by hazard and county to mitigate hazard impacts.
- Information on hazard risks in Hawai`i.

### **Partners**

Multiple partners from federal, state, and county agencies coordinated through the Hawai`i State Hazard Mitigation Forum.

### **Start and End Dates**

October 31, 2005, is the official end date for funding, however, the campaign has been designed to continue indefinitely.

## Updating NOAA charts and the U.S. Coast Pilot 7 for the Pacific Islands. NOAA Office of Coast Survey

**Project Lead:** Gerald E. Wheaton ([Gerry.Wheaton@noaa.gov](mailto:Gerry.Wheaton@noaa.gov), 831-583-2365)  
Office of Coast Survey, NOAA Nautical Charting Program

**Agency/Institution/Organization Acronym:** The Office of Coast Survey (OCS), NOS, NOAA

**Geographic Area of Interest or Application (region or island):** State of Hawai'i, Northwestern Hawaiian Islands, American Samoa, Guam, and CNMI.

### Goals/Objectives

It is said that 80 percent of everything Hawai'i uses is imported and that 98.6 percent of these imported goods are shipped by sea. In 2002, 22.6 million domestic and foreign tons of commerce passed through the State of Hawai'i. Maintaining high-quality data and information for application to charts and Coast Pilot 7 is essential to promote Hawai'i's maritime commerce. During times of national emergency, nautical charts and Coast Pilot 7 provide a continuous baseline for mitigating port and harbor closures.

### Description

A nautical chart is a graphic portrayal of the marine environment used by the mariner both as a "road map" and worksheet. Used in conjunction with other supplemental navigational aids, such as Coast Pilots and Notices to Mariners, the mariner is able to navigate a ship by the shortest and most economical safe route. A nautical chart shows the nature and form of the coast, the depths of the water and general character and configuration of the sea bottom, the locations of reefs, shoals, and other dangers to navigation, the rise and fall of the tides, the locations of man-made aids to navigation, the direction and strength of water currents, and the characteristic of the Earth's magnetism in the area of the chart. The Coast Pilot supplements the navigational information shown on the nautical charts.

### Products or Outcomes

Two chapters (14 and 15) in Coast Pilot 7 supplement the navigational information shown on the nautical chart. To date, chapter 14, Hawai'i, was completely revised. Contractors with local knowledge of their respective areas are currently revising Chapter 15, Pacific Islands, language for CNMI (Saipan and Rota) and American Samoa. Guam is next on the schedule for a chart evaluation survey and Coast Pilot update.

There are 65 NOAA nautical charts that cover the State of Hawai'i, Western Hawaiian Islands, and the Pacific Islands. Thirty-nine editions were published in 2000 or earlier and twenty-six were published between 1986 and 2000. All western Hawaiian charts were located with differential GPS for application to the nautical charts. Boundaries, such as a fishing and EEZ, will be included on the next edition of the chart associated with each island in the western chain.

### Partners

NOS Pacific Services Center, Office of Coast Survey, Office of Ocean and Coastal Resource Management, National Geodetic Survey, Coastal Services Center; and Island resource management agencies, port authorities, mariners, and other navigation interest.

**Start and End Dates:** Charts and U.S. Coast Pilot 7 are in continuous maintenance.

#### **4.2.3. Canoes and Paddles Matrix**

In addition, participants were asked to post current projects/activities on a large-scale Pacific Islands Risk Management Framework. The information complemented the notes from the canoes discussion sheets and the action plan, and assisted the groups in their deliberations.

**Table 7. Canoes and Paddles Matrix**

TOOLS	THEMES/CANOES			
	CROSS-CUTTING	SEISMIC, VOLCANIC, & TSUNAMI	CLIMATE AND WEATHER	HUMAN-INDUCED
<b>Coastal/Ocean Processes and Observations</b>	<ul style="list-style-type: none"> <li>• Global (GODAE) ocean products and regional subsets: <a href="http://apdrc.soest.hawaii.edu">http://apdrc.soest.hawaii.edu</a> (nowcasts, re-analysis, climatology – P.Hacker) (p. 5)</li> <li>• PC-Based Ocean Analysis &amp; Prediction System for quantifying and predicting coastal ocean fields and processes (Scientific Solutions, Inc.)</li> <li>• PDC's Distributed Info Network (DIN)</li> </ul>	<ul style="list-style-type: none"> <li>• ITSU working group SW Pacific and Indian Ocean Regional Tsunami Warning System planning</li> </ul>	<ul style="list-style-type: none"> <li>• Automatic Meteorological Observing Stations (AMOS) Replacement Plan, National Weather Service (dup)</li> </ul>	<ul style="list-style-type: none"> <li>• PILOT – OR&amp;R</li> <li>• Drift card study – ORR</li> <li>• Oceania Regional Response Team – Coordination/prep for oil spills and chemical releases) – EPA &amp; Coast Guard lead</li> <li>• Criminal Investigators for intentional human-induced risk (both planning for events, post events) EPA + partners</li> </ul>
<b>Data Management</b>	<ul style="list-style-type: none"> <li>• Data products and archive fields for coastal ocean regions (see above) (Scientific Solutions, Inc.)</li> <li>• Geodetic control – American Samoa, CNMI</li> <li>• Geodetic Control – Guam, Hawaii islands</li> <li>• NOAA/PSC – NGS - Height mod, p. 33</li> <li>• NOAA/PSC Data collection, Mining/Conversion p. 72</li> <li>• LIDAR data collection for Oahu - NOAA/CSC/PSC</li> <li>• I-Plan Hawaii</li> <li>• Natural Science research: long-term monitoring &amp; archive – USGS</li> <li>• Geo-spatial One-stop – OMB</li> <li>• Pacific Basin Information Node – USGS</li> </ul>	<ul style="list-style-type: none"> <li>• Global Historical Tsunami Database; World Data Center for Solid Earth Geophysics (WDC-SEG), ITIC, Russia, ITSU; ArcIMS &amp; PC-standalone</li> </ul>	<ul style="list-style-type: none"> <li>• Flood map modernization – FEMA</li> <li>• Post- &amp; pre-event surveys in relation to coral bleaching events in NWHI (PD) NOAA/NWHICRER</li> <li>• Long-term data analyses – Trends and patterns in hydrology – USGS</li> <li>• Regional Analysis of Magnitude &amp; Frequency of Floods in Hawaii – USGS</li> </ul>	

**Table 7. Canoes and Paddles Matrix (cont'd.)**

TOOLS	THEMES/CANOES			
	CROSS-CUTTING	SEISMIC, VOLCANIC, & TSUNAMI	CLIMATE AND WEATHER	HUMAN-INDUCED
<b>Decision-Support Tools</b>	<ul style="list-style-type: none"> <li>• USGS Natural Hazards Support System</li> <li>• NOAA PSC/CSC - Decision Support Tools, p. 20</li> <li>• Bring Storm Ready/Tsunami Ready Status to Guam, Rota, Tinian, Saipan – National Weather Service</li> <li>• Digital Comprehensive Planning for Counties &amp; Communities – Digital &amp; Model-Based – Contact Wil Orr</li> <li>• Mitigation Planning – FEMA</li> <li>• HAZUS-MH for island environments – FEMA</li> <li>• USGS National Map</li> <li>• Nautical Charts</li> <li>• America Samoa risk &amp; vulnerability assessment &amp; hazard mitigation plan completed! p. 53</li> <li>• USGS – Landslide Mapping work</li> <li>• Coastal Hazard Mitigation Guidebook – Integrates Hazard Mitigation Measures into the development process ( Pacific Services Center, Coastal Services Center, DLNR – Hawaii, CZM – Hawaii)</li> </ul>	<ul style="list-style-type: none"> <li>• The National Tsunami Hazard Mitigation Program (NOAA, USGS, FEMA, NSF, States) (maybe break this into activities?)</li> <li>• Tsunami Historical Data – Mapping Site (mentioned by Laura Kong)</li> <li>• PSC/UH – Slope Movement Assessment Tool (seismic-induced liquefaction)</li> <li>• Hawaii customized hazards earthquake model – State Civil Defense, Hawaii</li> <li>• Pacific Disaster Center – Hawaii HAZUS Atlas of Top 20 Earthquakes (historic) – output determined by and displayed in PPT for decision makers. (p. 53)</li> <li>• TROIKA – Int'l Comprehensive Tsunami Hazard Reduction Program (Hazard Assessment, Mitigation, Warning) new project of ITSU</li> </ul>	<ul style="list-style-type: none"> <li>• Fire Weather Support Program for the Mariana Islands - National Weather Service</li> <li>• Install HURREVAC software at all Micronesian Emergency Management Offices (EMO) – National Weather Svc</li> <li>• FEMA/USACE - HURREVAC Model</li> <li>• HURREVAC Inland Flood Module – FEMA</li> <li>• HURREVAC Module for Islands – FEMA</li> <li>• NOAA's SLOSH Display Model</li> <li>• NOAA CSC - Historical Hurricane Tracks Internet Mapping Site</li> <li>• FEMA/USACE - Mass Management Tool Mass Management tool for Emergency Operations in Island Environments</li> <li>• Pacific Island Regional Integrated Science and Assessment (Pacific RISA) Program – 3 year funding</li> <li>• PEAC Review – Questionnaire &amp; Report</li> <li>• (Publish and) implement Saffir-Simpson Tropical cyclone scale in Micronesia – National Weather Service</li> <li>• Topographic Wind Effects Model for island terrain &amp; Hurricane (cyclone, typhoon) Rotational Windfield Model – Martin &amp; Chock</li> </ul>	<ul style="list-style-type: none"> <li>• Develop Typhoon Vulnerability Studies for Micronesian Islands – National Weather Service</li> <li>• Hazard Maps</li> <li>• Landslides</li> <li>• NOAA OR &amp; R – Digital ESI map development (Guam, Samoa, HI)</li> <li>• NOAA OR &amp; R – Cameo Model</li> <li>• Chemical release modeling and GIS –CAMEO/ALOHA (OR&amp;R)</li> <li>• ESI Maps (Environmental Sensitivity Index Maps) – OR&amp;R</li> <li>• Oil Spill Trajectory Models (Gnome Tap) – OR&amp;R</li> <li>• Resources &amp; Undersea Threats (RUST) – USCG</li> </ul>



**Table 7. Canoes and Paddles Matrix (cont'd.)**

TOOLS	THEMES/CANOES			
	CROSS-CUTTING	SEISMIC, VOLCANIC, & TSUNAMI	CLIMATE AND WEATHER	HUMAN-INDUCED
<b>Communications Infrastructure and Information Dissemination</b>	<ul style="list-style-type: none"> <li>• RANET</li> <li>• Tsunami Ready/Storm Ready – (National Weather Service)</li> </ul>		<ul style="list-style-type: none"> <li>• PEAC ENSO Update, Climate Forecasts</li> <li>• World Meteorological Organization (WMO) – Regional Association V (RAV) Tropical Cyclone Operational Plan</li> <li>• EMWIN – (NOAA &amp; Region)</li> <li>• NOAA Weather Radio (NOAA)</li> <li>• Re-evaluation of tropical cyclone warning points in Micronesia – National Weather Service</li> </ul>	
<b>Post-Disaster Evaluation and Performance Indicators</b>	<ul style="list-style-type: none"> <li>• Guam is developing (locally) a response plan for environmental impacts of disasters – involving community in past-disaster response. Plan will include “partnership” efforts between federal &amp; local govts. &amp; stakeholders</li> <li>• Dept of Homeland Security is re-writing National Response Plan to include Response to environmental impacts after declared disasters. NOAA/DOI/EPA are part of drafting team. This effort is in response to concerns raised from local stakeholders.</li> <li>• Landslide evaluation (USGS)</li> <li>• Fire evaluation (USFS, USGS, NRCS)</li> <li>• HAZUS-MH (FEMA)</li> <li>• Building Performance Assessment Teams – FEMA (only for significant disasters) Iniki/Andrew, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Multi-Hazard Post-Event Technical Clearinghouse - Hawaii SCD, PDC, ITIC (EQ &amp; Tsunami); GIS-based information sharing in secure environment</li> <li>• Earthquake Evaluation (USGS)</li> <li>• Natural Resource Damage Assessment &amp; Restoration (USFWS)</li> <li>• Learning from Earthquakes (reconnaissance report worldwide for significant earthquakes) Relevant to islands? – (Earthquake Engineering Research Institute)</li> </ul>	<ul style="list-style-type: none"> <li>• Island Climate Update – NIWA</li> <li>• Post-storm assessment of hurricane emergency activities</li> <li>• Post-Storm Data Acquisition (NWS)</li> <li>• PEAC Post ENSO Assessment (NOAA)</li> <li>• High Water Marks (USGS, FEMA, USACOE)</li> <li>• Loss Estimation (AAL, State Civil Def)</li> <li>• Documentation of impacts from extreme storm events – primarily hydrologic in nature – USGS</li> <li>• Documentation of drought impacts (primarily hydrologic) – USGS</li> </ul>	<ul style="list-style-type: none"> <li>• Wildlife Recovery &amp; Rehab – (USFWS)</li> <li>• Natural resource damage assessment and restoration (OR&amp;R, USFWS)</li> <li>• Natural resource recovery research (OR&amp;R)</li> </ul>

**Table 7. Canoes and Paddles Matrix (cont'd.)**

TOOLS	THEMES/CANOES			
	CROSS-CUTTING	SEISMIC, VOLCANIC, & TSUNAMI	CLIMATE AND WEATHER	HUMAN-INDUCED
<b>Education and Outreach, Training</b>	<ul style="list-style-type: none"> <li>• PREL Network Service Centers with Internet, fax, resource; staff people in each entity; capability to develop curriculum</li> <li>• NOAA/FHMPPI Activity Report</li> <li>• Haz. Mit. Training – Business Continuity; government stakeholders – CZM HI</li> <li>• Educational Products for Decision-makers – Public Schools – CZM HI</li> <li>• NOAA/PSC - GIS Training</li> </ul>	<ul style="list-style-type: none"> <li>• CSAV International Training Course in volcano hazards monitoring</li> <li>• CSAV – Public information videos on: tsunami, earthquake preparedness, flash flooding</li> <li>• CSAV – Outreach booth at builders expo, printed handouts with earthquake mitigation activities</li> <li>• CSAV – School/classroom visits on hurricane/tsunami hazards</li> <li>• ITSU Tsunami Training Program – Warning Systems, Mitigation, Education &amp; Outreach covered</li> </ul>	<ul style="list-style-type: none"> <li>• Climate and Extreme Weather Training Institute year one: In residence; year 2 &amp; 3: module in country training module</li> <li>• Symposium on Climate and Extreme Events in Asia &amp; Pacific: Enhancing Resilience and Improving Decision Making (dup)</li> </ul>	<ul style="list-style-type: none"> <li>• Oil Spill Response and HAZWOPER Training (USFWS)</li> <li>• Science of Oil Spill Training – OR&amp;R</li> <li>• Incident Command System Training (Coast Guard Strike Teams)</li> <li>• EPA/NOAA workshop on indicators of land-based sources impacting coral reefs (4Q FY 04) in Honolulu</li> </ul>
<b>Traditional Knowledge and Practices</b>	<ul style="list-style-type: none"> <li>• American Samoa – Village to Village Hazard Mitigation Coordination Project</li> <li>• Village examples of integrating science with traditional knowledge (Kiribati, Fiji, etc.)</li> <li>• Am Samoa – Hazard warning system outreach through church sermons</li> <li>• Maori website re: traditional information</li> <li>• Hawaiian language newspaper translation project – CZM/Sea Grant...focused on traditional resource mgmt. practices</li> <li>• Am. Samoa – Village implemented MPA resource mgmt. efforts</li> <li>• Bridging traditional knowledge w/ scientific &amp; technical knowledge – Waianae Ecological Characterization – CZM HI</li> </ul>			

Other aspects to consider that don't fit well into this matrix: Policy Making, Regulation, Legal Validation, Customer Validation, Prevention

### 4.3. Establishing the *Hui O Hana*: Paddles

This session focused on how each *hui* tool area can be brought to bear to address identified use-sector needs, establish priority action items, determine the implications of this to the embryonic action plan, and discuss individual roles and responsibilities. The *hui* were as follows:

- Coastal and Ocean Processes and Observations
- Data Management
- Data Analysis and Decision-Support Tools
- Communications Infrastructure and Information Dissemination
- Post-Disaster Evaluation and Performance Indicators
- Education, Outreach and Training
- Traditional Knowledge and Practices

Breakout discussions were led by designated Steersman for each *hui*. Specifically, the small groups were asked to address the following questions:

1. *What projects or activities should be undertaken to address identified use-sector needs that fall into any or all of the theme/canoe areas?*
2. *Are there projects or activities under way that attempt to meet these needs? If so, how can they be improved upon through enhanced communication, coordination, or collaboration?*
3. *Are there projects or activities that should be undertaken to address unmet but identified needs? Of these, what are the highest priorities and why, who should have the lead responsibility, what type of support is needed, and what challenges will need to be overcome?*

Steersman reported the results of the breakout sessions to the entire group. Responses to questions 1 through 3 are listed in the following sections.

## COASTAL AND OCEAN PROCESSES AND OBSERVATIONS *Hui*

### Needs

1. Observations for forecast initialization
  2. Nowcast (wind, waves, currents, temp, etc.)
  3. Observations of extreme events
  4. 12-month ENSO accurate forecast (specifies rainfall, sea level, cyclonic activities)
  5. Regional climate model
  6. Historic database
- Tsunami – more skillful tsunami alerts
  - Anthropogenic
    - Oil spill movements and other
    - Tailored forecast
    - Portable rapid deployment observation
    - Terrorist threat vulnerability maps for environment

### Projects under Way

- Pacific island land ocean typhoon experiment PILOT
- GOOS/GODAE/GCOS
- Wave information study (Hindcast – USACE)
- Regional modeling
- PEAC
- Hurricane inundation study (USACE for Hawai'i, American Samoa, Guam, CNMI)
- Statewide hazard mitigation plan
- Vulnerability study

### New Projects

- Inventory and assessment of existing capabilities
- Set up and fund Hawai'i-Pacific ocean observation system (to measure currents, high-resolution atmospheric forcing fields, breaking waves, high-res sea level, high-res bathymetry/topography, observation research and development [adaptive sampling, obs. system simulation experiment, biogeochem sensor])
- Develop pre-positioned rapid observation systems
- Model for concurrent surge and river flooding
- Next generation (3D) surge models

### Recommendation

Steering/assessment committee to evaluate existing capabilities to see where voids are

### Steersmen

Fed: Stanley Boc, USACE

Nonfed: James Lewis

## DATA ANALYSIS AND DECISION-SUPPORT TOOLS *Hui*

### 1. What end-user needs (in any or all of the hazard/canoe areas) should be a priority for this tool group?

- Access to hazard maps and various decision-support tools based on hazard maps. This information is needed for long-term planning (land use and hazard mitigation planning), preparedness planning (hurricane, tsunami, etc. planning – evacuation plans, shelter plans, etc.), and real-time response activities.
- Organization of existing base data and hazards data was needed. In addition, the creation of other essential data sets is needed.
  - Activities utilized to address this end-user need will help to steer the development of effective decision-support tools.
  - The effectiveness of decision-support tools and the ability of end users to utilize and customize those tools could be enhanced through the creation of one centralized data portal.
- End-users need better hazards information locally. In many cases, good hazards risk and probability data are not currently available, especially not in a GIS format.
- End-users need an inventory of the decision-support tools currently available, as well as their current use in the Pacific Islands.
- There is a need for real-time and/or scenario models that present their results in a graphical format (maps).
- End-users at the local level need the capability and capacity to utilize hazard risk and vulnerability data in their existing long-term comprehensive planning process. They also need the capability and capacity to utilize hazard risk and vulnerability data in their real-time response activities.
- There is a need to enhance data collection after an event has occurred. In many cases, some of the vital data, which could be used to enhance decision-support tools and enhance models through hindcasting and validation, are lost after an event. There is a need to identify post-storm collection needs prior to a hazard event. (Through collaboration with the Post-Disaster Evaluation and Performance Indicators *Hui* at the meeting, it was learned that they had planned to address this issue in one of their action items for the next 12 months. The Decision Support Tools *Hui* will collaborate with them on this task throughout the year).
- In addition to tools that identify people, resources, and infrastructure located in hazard risk areas, it was determined that the end-users, including the public, needed training, guidebooks, and other tools to help them determine the appropriate measures to address the risks. They also needed information on the appropriate use of any of the decision-support tools, models, or data sets.

### 2. Are there projects already under way that attempt to meet these needs? If so, can they be improved through enhanced communication, coordination, or collaboration? How?

- There were numerous efforts currently going on that were mentioned during our *hui* discussions. However, many of them are not captured in this summary, since they were placed on the Pacific Islands Risk Management Framework matrix within the “Decision-support Tools and Training” section.
- The following current activities were captured:

- NOAA PSC/University of Hawaii Slope Movement Assessment Tool (seismic-induced liquefaction). Enhancement could potentially be achieved through collaboration with USGS (Ed Harp) and his landslide mapping efforts.
- FEMA's HAZUS-MH model could potentially be enhanced through collaboration with existing efforts such as NOAA PSC-funded "Wind Vulnerability Assessment of Typical Residences in American Samoa" and other similar efforts to develop more island-specific risk parameters. The model could also be enhanced through data collection efforts undertaken by the Data Management *Hui*. The HAZUS-MH model currently lacks the base layer data sets (building infrastructure, critical facilities, etc.) to run the model efficiently in the islands.
- Digital Environmental Sensitivity Index (ESI) map development is currently under way in Guam, American Samoa, and Hawaii by the NOAA Office of Response and Restoration (OR&R). These maps can be utilized to help identify environmental vulnerabilities and will enhance the ability of the many of the local fire departments and city planners who are already utilizing the NOAA OR&R Cameo model. Collaboration with existing data portals (PDC's Risk Atlas, etc.) could help to expand the use of the new ESI maps when completed.
- There is already a requirement at the local level for communities to develop local comprehensive plans. In many cases these plans don't incorporate hazard risk considerations. There is also the Hazard Mitigation Plan development process that locals, states, and U.S. territories are currently undergoing to meet the requirements of the Disaster Mitigation Act of 2000. There should be an effort to ensure that these two, often separate, planning efforts are combined. FEMA through their leadership and approval authority for the Hazard Mitigation planning process should take a leadership role. The current NOAA RISA/Maui Integrated Growth and Disaster Modeling Project led by the East-West Center could help serve as a model for incorporating hazard risk considerations into the comprehensive planning process.
- Numerous risk atlases, on-line mapping efforts, and historical hazard mapping applications currently exist or are under development for the Pacific. An effort should be made to merge these efforts or to ensure that each is aware of the others' efforts so that they can reference each other. In some cases, it may not be efficient to merge the efforts into one application/tool, due to scale issues, etc. The PDC has a Risk Atlas, Hawaii has developed a Natural Hazards Atlas, there is a historical tsunami mapping application (mentioned by Laura Kong during one of her presentations), the NOAA Coastal Services Center has a Historical Hurricane Tracks Mapping Tool, the USGS conducts National Map efforts, FEMA conducts its Map Modernization and Multi-Hazard Mapping efforts, and the NOAA Pacific Services Center and Coastal Services Center are currently developing a village-scale hazards vulnerability assessment tool. No lead was identified for overseeing the coordination of these tools, but the PDC seems appropriate, since its area of responsibility covers all of the areas that the other tools apply to and since they have an existing Risk Atlas, could potentially take the lead (there was no member from PDC participating in our *hui*).
- USGS's Science Impact Program, led by Rich Bernknopf, is currently developing science-based tools to help local decision makers develop economically sound hazard mitigation decisions (few details on this activity were provided to the *hui*).

- FEMA and USACE have developed the HURREVAC model (used by emergency managers to track hurricanes, plan hurricane response activities, and to plan and monitor evacuations) and an islands mass management tool. There is an effort to update these tools to make them more user-friendly and useful for the islands. The Interagency Coordinating Committee on Hurricanes, led by FEMA, is establishing an Islands Working Group to address this issue. They will lead the efforts, but the *hui* should ensure that they help steer the development of any enhancements.

**3. Are there new projects or activities that should be undertaken to address these needs? Who should take the lead and what resources will be required?**

- Conduct a cursory inventory of existing decision-support tools (use of the tools in the Pacific Islands, applicability of tools to the Pacific that aren't currently in use in the Pacific Islands, availability, data needs, limitations – cursory look); support current efforts to evaluate the applicability of FEMA's new HAZUS-MH model in the Pacific Islands. (A review of the applicability of the model to Hawai'i has been initiated in Hawai'i by the Hawai'i State Earthquake Advisory Committee Planning Sub-Committee through the development of a draft document entitled "Preliminary Summary of Issues and Comments Relating to Applications in the Pacific Region for Earthquake, Flood and Hurricane Loss Estimation and Related Information Products." They have expressed a desire for assistance from the Decision-Support Tools *Hui* for broadening their existing analysis to other Pacific Insular U.S. Territories.) Following the completion of the cursory inventory, the Decision-Support Tools *Hui* may choose to conduct a more detailed assessment of the applicability of one or more of the tools in the Pacific Islands. The Decision-Support Tools *Hui* will coordinate with the Data *Hui* on this task. The NOAA Pacific Services Center will lead this task.
- Steer development of a Pacific Island version of HURREVAC model to make it a more robust hurricane decision-support tool, as opposed to just a tracking tool. The Interagency Coordinating Committee on Hurricanes, led by FEMA, is establishing a new Islands Working Group that will address this and other islands issues related to hurricanes and tropical cyclones. The Islands Working Group will lead this effort, but the Decision-Support *Hui*, through FEMA, NOAA Coastal Services Center, and NOAA Pacific Services Center members will contribute to the effort.
- Coordinate with all other *hui* to optimize our efforts and resources.

**Steersmen**

Adam Stein, NOAA Pacific Services Center  
Dolan Eversole, UH Sea Grant

## **Data Management *Hui***

### **Flow Charts of Data Management**

Reflect short and long term

#### **Data Management**

- End-User Needs
- Baseline Data (all users, establishes foundation)
  - Elevation (XYZTM)
  - Geodetic Control
  - Imagery
  - Demographic Data (Special needs population)
  - Infrastructure
    - Utilities, transportation, structures (critical facilities/services), building insurance
  - Economics
  - Natural Process (currents, waves)
  - Natural and Cultural Resources

#### **Ongoing Projects**

- Geospatial One Stop
- PBIN (Pacific Basin Information Node)
- DIN (PDC), Hazard Atlas, DOD, etc.
- NCDDC – Coastal Data Services
- Homeland Security Data Needs
- National Map, Nautical Charts
- I Plan, Private Companies
- HARN – AS, CNMI, Guam, HI

#### **Ways to Make These Projects Better**

- Regional Coordination Management with end-user
- Greater Participation

#### **New Projects**

1. Conduct workshop with data providers and brokers to promote information exchange, awareness, access, and use of data related to hazard/risk management.

#### **Outcomes**

- Inventory or catalog of disaster management data resources
- Data model or “standards”
- Better integration and access to data; best practices and common tools for data access

#### **Who should attend?**

- Data providers such as
  - SOPAC, NOAA, USGS, FEMA



- PDC, UH
- State and Territorial GIS Offices
- City/County GIS offices
- Data standard experts such as FGDC or ESRI

### **Steps**

1. Identify participants and agencies.
2. Develop a template or draft framework to gather information from participants before the workshop –  
The framework would look similar to the I-Plan categories. Participants would map their data sets and information to this framework, but it will only be a starting point.
3. Plan workshop, by selecting a venue and a date, and inviting participants.

### **Funding**

- Possible funding from PDC, NOAA, and others
- Expenses are estimated to be small and associated with physically accommodating 10 to 15 people for 1 or 2 days.

### **Timeline**

- 4 to 6 months
- Ideas to coordinate workshop with other events (such as GISMAP in June 2004 or ESRI User Group meetings)

### **Coordinator**

- Eric Wong from USGS with working group comprised of USGS, PDC, NOAA, and UH

2. *Conduct workshop with data providers and the risk management community to expose them to data resources and identify data gaps.*

### **Outcomes**

- Allow the participants to become more familiar with existing data sets and how they can be used.
- An inventory of data gaps/data needs by the community

### **Who should attend?**

- End users. The emergency management community. People who support first responders or planners/managers that support first responders. The actual first responders (such as firemen or police) may not be the target audience. The appropriate audience might be the coordinator for the fire department or the data coordinator for the city/county or state civil defense staff.
- Data providers (a subset from the previous workshop)

### **Steps**

1. Identify participants and agencies – target the correct people through invite only.
2. Develop a questionnaire for participants to provide information on their current data resources, how they get data (through partners, contractors, vendors), and their top three missing data sets.
3. Develop the workshop based on the questionnaire to address their current data resources and gaps. Provide them a hands-on experience so they can learn how to access data and use it for their risk events.
4. Plan workshop by selecting a venue and a date and inviting participants.

### **Funding**

- Possible funding from some *hui* member organizations
- Need additional funding
- Expenses would include a location for 15-30 people for 1 or 2 days plus computer equipment and software

### **Timeline**

- 6 to 12 months
- Ideas to coordinate workshop with other events (such as Homeland Security in Asia and the Pacific in November 2004)

### **Coordinator**

- Eric Wong from USGS with working group comprised of USGS, PDC, NOAA, and UH

### **Proposed Steersmen**

Eric Wong – USGS, Federal Representative

Larry Kanda – Local Disaster/Risk Manager

Backups are

- Eric Yamashita
- Cheryl Anderson

## **POST-DISASTER EVALUATION AND PERFORMANCE INDICATORS *Hui***

### **Needs relevant to tools. We all need to**

- Do a better job of coordinating post-disaster evaluations across levels of government and with the general public
- Realize that a national, “one size fits all” does not address the island physical, cultural, economic, and environmental issues
- Remember and involve the general public in the evaluations and incorporate their information and experience
- Use “community-based risk management.” The “bottom up” process leads to better planning. (Being used for multi-hazard local/state mitigation plans and local action strategy (coral reefs))
- Better capture perishable data, longer-term data and effects, broader area of interest (not just the built environment)
- Develop better hazard education and outreach to the general public and transitory residents (visitor industry)

### **Ongoing Projects**

- Landslide Evaluations (USGS)
- Hydro Documentation (USGS)
- Post-storm Data Acquisition (NWS)
- Earthquake & Volcano Evaluations (USGS)
- Fire Assessments & BAER (USFS, USGS, NRCS, DOI)
- High Water Marks (FEMA, USGS, ACOE)
- PEAC Post-ENSO Assessments (NOAA)
- Food & Ag Damage Reports (USDA, Farm Service)
- Drought Taskforce Reports (Hawaii SCD)
- Guam Post-disaster Response Plan to Natural Disasters
- ACOE Post-event Performance Evaluations
- Post-flood Assessments (FEMA-NFIP)
- Oil Spill Response & Event Training
- Building Performance Assessment Team Reports (FEMA)
- State Post-storm Assessment (Hawaii SCD)
- Joint Preliminary Disaster Assessment (FEMA)
- EERI “Learning from EQ’s”
- Post-event Ad Hoc TAC Reports (FEMA)
- Rapid Reports (U of Colorado)

### **New Projects or Activities**

- National Hazard Experience Database – PSC/PDC/UH SSRI/UoG/local & state governments
- Pictorial documentation & visualization tools – PSC/PDC/UH SSRI/UoG/ local & state governments
- Planning and training, on a regular basis, to develop consistency of evaluations across government levels – FEMA/USGS/?

- Make HAZUS-MH more island appropriate – FEMA/USACOE/PSC

**Steersmen**

Sally Ziolkowski, FEMA

Cheryl Anderson, UH SSRI

## **Education, Outreach, and Training *Hui***

### **Definitions**

*Education:* Formal curriculum based on audience level

*Training:* Specific, task-oriented (e.g., technical, regulatory, mandatory short-term)

*Outreach:* General, public marketing of programs, understandable by general audience

### **Users**

Government/Local Decision Makers

Responders

Public: Affected/Media

Planners

Researchers

### **Product Examples**

Manuals, guidebooks, how-to brochures, video, DVD, visual guides, briefing papers/books, need to translate scientific information to address audience needs.

### **Responder Needs**

#### *Training*

- Tabletop exercises (disaster scenarios)
- Safety, response training (e.g., Nat'l Response Plan, or NRP, ICS training, HAZWOPER training)
- Refreshers/updates
- Overarching training for all agencies and individuals involved in hazard response about how NRP functions
- Basic IT capacity building
- Basic on-the-ground response capabilities
- Training for the trainers locally

#### *How to Improve Tabletop Exercises*

- Locally based, on-island
- Include local leadership, local customs, all stakeholders
- Make multihazard
- Strategically timed (e.g., before disaster; after leadership change)
- Follow-up evaluations – lessons learned
- Avoid overlap of training by producing a catalogue of available training – need a schedule to share among agencies

### **General Public Potentially Impacted by Natural Disaster Needs**

- 1) Making hazard information more accessible to the general public—like developers, home buyers, residents new to the area—so they can make better informed decisions about buying new homes or developing new areas and the hazards present.

- 2) There are already programs to address this, such as available zoning and hazard maps on the Internet, as well as higher cost of insurance for building in high hazard areas but this is not enough. We need better ways to get out the information like more visual outreach materials, information in schools, hazard brochures targeted to new home buyers, etc.
- 3) New programs can be established to address this, such as more outreach, economic incentives to modify homes to better survive hazards. Need to partner with the insurance industry to make existing information more widely available.

### **New Projects**

Recommendations for action within the next 12 months:

- Work through agency to reflect within the organization's strategic plan annual action items to identify training for end-line users in Pacific jurisdictions as a priority.
- Advocate creation of multiagency education outreach board to serve as advocate for hazard mitigation education/outreach materials.
- Advocate the creation of a e-mail list for Federal Hazard Mitigation Partners in the Pacific to be used for training announcements and availability of materials.

### **Steersmen**

Fed: Karen Rosa, USFWS

Non-fed: Jackie Burniske, PREL

## TRADITIONAL KNOWLEDGE AND PRACTICES *HUI*

### What end-user needs should be a priority for this tool group?

- Local communities, research/science, educators, government, industry
- Local and regionally-coordinated ethnographic research/documentation: convey the information that is culturally sensitive to island communities and leaders
- Information to educate decision/policy-makers regarding the value of traditional resource management (provide concrete correlations)
- Traditional construction methods
- Historical documentation of traditional knowledge – Ethnographic research
- Ability to be aware of threats and be better prepared through indigenous knowledge (documentation of bio-indicators)
- Integration of appropriate traditional knowledge and approaches into the formulation of adaptation response strategies to hazards
- Hazard events, frequency/magnitude info

### Are there projects already under way that attempt to meet these needs?

- Alaska/American Indian Indigenous Knowledge Project (Dr. Henry Huntington)
- Arctic Indigenous peoples programme (Dr. John Grump) [www.arcticpeoples.org](http://www.arcticpeoples.org)
- Finnish/Russian Indigenous knowledge project (Dr. Tero Munstonen, Finland [www.snowchange.org](http://www.snowchange.org))
- Center for Science and the Environment (India)
- National Institute of Water and Atmospheric Research's (NIWA) traditional knowledge in selected Polynesian communities (Samoan and Maori) project: Web site: [www.niwa.co.nz](http://www.niwa.co.nz). NIWA website on traditional knowledge will be launched in June 2004
- The Australian Bureau of Meteorology Indigenous weather knowledge project ([www.bom.gov.au/iwk/](http://www.bom.gov.au/iwk/))
- Village examples (Kiribati, Palau, Fiji, etc.): Bringing science tools down to the village level and integrating with contemporary science/decision-making (GIS, etc.)
- Samoa – Village-implemented MPA resource mgmt. (Fatia & Haloa Villages)
- Samoa – Hazard Warning System (resource mgmt.)—use of religion as avenue for cultural communication
- Samoa – Village to Village Program to coordinate hazard mitigation (NOAA funding)
- Gender Equality and Disaster Risk Reduction Conference – August 10-12, 2004
- Culturally influenced watershed management (e.g., ahupua`a)

### Are there new projects or activities that should be undertaken to address these needs?

#### Who should take the lead and what resources will be required?

- Cultural Practitioners Network – Transfer knowledge from generation to generation
- Pacific Islands Indigenous Conference
- How to communicate information that is sensitive to cultures (culturally appropriate outreach)
- Regional database/Web site of traditional/cultural information; could also document gender-based information

- Document traditional knowledge and practices as they relate to natural and environmental hazards and threats; losing knowledge, need to recover knowledge, integrate with science, and effectively communicate to end users
- Validation/verification
- Document traditional/cultural practices success stories which complement contemporary practices
- Integration of traditional architecture
- Cross-canoepaddle committee coordination
- Geographic Positioning System (GPS)/GIS of culturally sensitive resources (e.g., burials)
- Cross-cultural sensitivity/representation within multicultural settings

### **Paddle Goals**

- Integration of traditional and cultural knowledge and practices with contemporary technical and scientific research and decision making to enhance the assessment of risk and vulnerability and culturally appropriate mitigation measures for the Pacific region.
- Institutionalize traditional and cultural knowledge through programmatic actions (e.g., rules, ordinances, law, and policy) that will reduce environmental, sociocultural, and economic impacts to Pacific Island communities.
- Work with Pacific Island partners, stakeholders, and communities about the wealth of knowledge and usefulness of recording and application of traditional and cultural knowledge.

### **Paddle Objectives**

- Identify previous, ongoing, and future efforts related to the documentation of traditional and cultural knowledge regarding climate change and variability.
- Identify and invite traditional and cultural practitioners throughout the region to join a Cultural Practitioners Advisory Group to (1) share their knowledge of climate change and variability; (2) identify other traditional and cultural sources of information; and (3) provide spiritual guidance with regard to the development of tools, mechanisms, and policies to improve the consideration and integration of traditional and cultural knowledge.
- Develop tools, strategies, mechanisms, protocols, policies, etc. that allow for the integration of traditional and cultural knowledge.

### **12-month Commitments**

1. Inventory of information-gathering activities under way and completed, including an inventory of individuals and organizations doing this (Leads: Atu Kaloumaira and Chris Chung)
2. Initiate network of cultural practitioners (Leads: Chris Chung and Atu Kaloumaira)
3. Publish Web database (Leads: Pene Lefale and Kris McElwee)
4. Communicate regularly via e-mail and in person (Chris Chung will take first step; Kris to set up e-mail list)

*Nalowale ka waiwai ka maluhia ole.*



“The wealth of our resources is lost without balance.”

**Steersmen**

Pene Lefale, NIWA

Atu Kaloumaira, SOPAC

with support from

Chris Chung, Hawai'i Coastal Zone Management Program

## 5. REVISING AND REFINING THE ACTION PLAN: CHARTING A COURSE

### 5.1. Revised Action Plan Framework

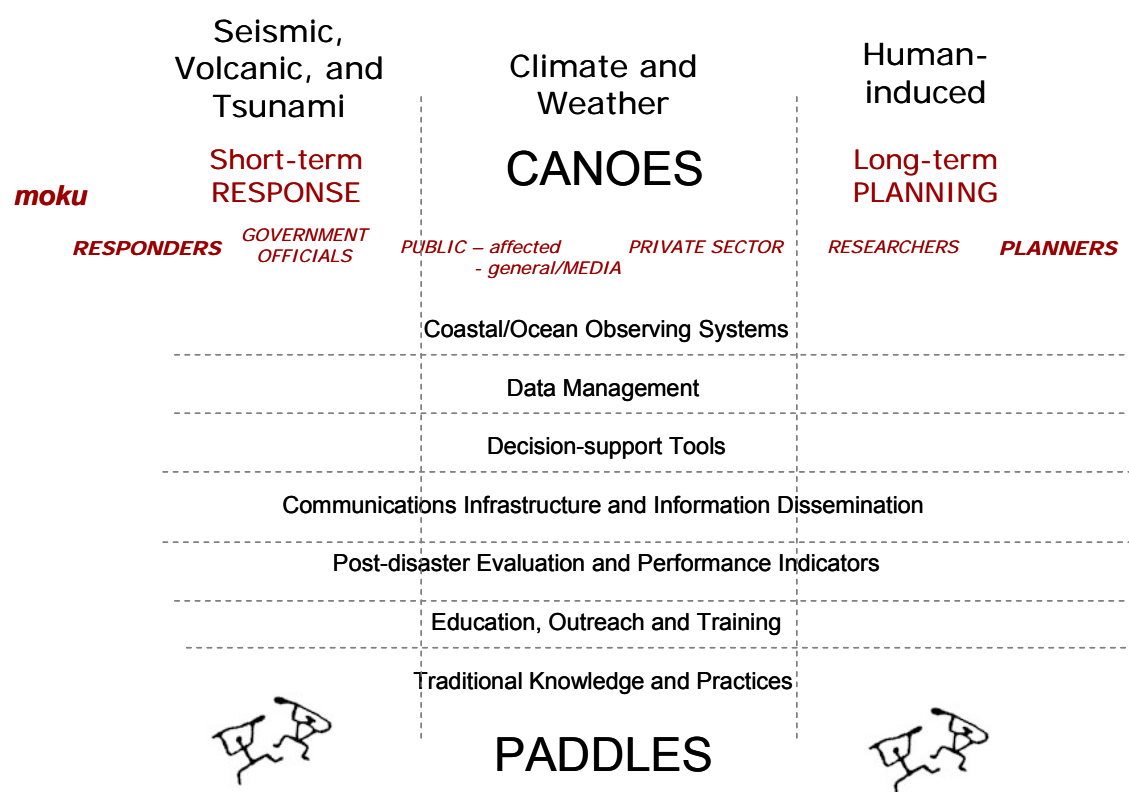


Figure 3. The Pacific Islands Risk Management Framework – Revised

Following from the canoes and paddles discussions that took place over a day and a half, the proposed risk management framework was revised. The principal modification pertained to the classification of users of risk management information products and services. It involved the recognition of a distinction between short-term decision making by emergency/incident responders and long-term decision making by mitigation planners/resource managers and the identification of these two groups as primary use sectors. A minor modification involved moving training from the decision-support tools *hui* to the education and outreach *hui*.

### 5.2. Action Plan Goals and Objectives

Following from the canoes and paddles discussions that took place over a day and a half, a draft outline of action plan goals and objectives was developed and presented to

the group. The following is a revised version of the outline presented at the meeting. Further revision and refinement of this outline will be carried out over the next 12 months. See Section 6 for further details.

**GOAL 1: Enhance communication, coordination, and collaboration.**

**Objective 1:** Develop processes and procedures that will ensure a sustained dialogue among the network of risk management partners and stakeholders in the Pacific and cultivate a sense of community and an appreciation for the unique physical and cultural characteristics of the Pacific.

**GOAL 2: Enhance the collection and management of framework, hazards, and assets data.**

**Objective 2.1:** Promote the collection of framework, hazards, and assets data, including improved coastal, ocean, and atmospheric observing capabilities.

**Objective 2.2:** Promote the management of framework, hazards, and assets data, including regional standards and protocols.

**GOAL 3: Enhance the development and delivery of information products and services.**

**Objective 3.1:** Support short-term decision making by emergency/incident responders, long-term decision making by mitigation planners/resource managers, and other affected parties including government officials, the affected public, the private sector, and the media through the development and delivery of inventory and post-disaster data collection tools.

**Objective 3.2:** Support short-term decision making by emergency/incident responders, long-term decision-making by mitigation planners/resource managers, and other affected parties including government officials, the affected public, the private sector, and the media through the development and delivery of risk and vulnerability analysis tools.

**Objective 3.3:** Support short-term decision making by emergency/incident responders, long-term decision-making by mitigation planners/resource managers, and other affected parties including government officials, the affected public, the private sector, and the media through the development and delivery of risk management measure and policy option analysis tools.

**Objective 3.4:** Support the development and deployment of communications infrastructure and mechanisms that provide for consistent, effective, and timely dissemination of information.

**Objective 3.5:** Support the development and use of performance measures as a means to improve the development and delivery of information products and services.

**GOAL 4: Enhance education, outreach, and training.**

**Objective 4.1:** Support the development and distribution of educational and outreach materials for affected parties, including government officials, the general public, the private sector, and the media.

**Objective 4.2:** Promote the documentation and dissemination of traditional and cultural knowledge and practices.

**Objective 4.3:** Support the development and distribution of training materials and programs as a means to build the capacity of local emergency/incident responders and mitigation planners/resource managers.

### 5.3. Hui O Hana Priority Action Items

The session focused on how the 2003 Action Plan should be revised based on the results of the meeting. Working from summaries of the themes and tools discussions, and considering the 2003 Action Plan, the questions to be answered were as follows:

- *Based on the results of discussions during the meeting, what are the top-priority program/initiative areas in the Pacific Islands region?*
- *What existing key projects or activities warrant support or expansion, provide an opportunity for coordination and collaboration, or may need to come to fruition?*
- *What new projects are warranted at this time, and who should be responsible for taking the lead in such efforts?*
- *What is needed and possible immediately (6 to 24 months), and what is needed and possible over the short term (2 to 5 years)?*

One of the key outcomes of the meeting—the identification of specific projects and/or activities that would lend themselves to a collaborative effort over the next 12 months—was distilled by the seven working groups. Recommendations from groups are itemized in Table 8.

**Table 8. Hui O Hana Priority Action Items**

Working Group	Recommended Activities
Coastal/Ocean Observations and Processes	<ol style="list-style-type: none"> <li>1. Form a working group to gather inventory of observing instruments and perform assessments of instrumentation and modeling capabilities (Lead: Stan Boc, USACE). <span style="float: right;">1 year</span></li> <li>2. Submit a proposal for a Regional Association (Lead: Stan Boc, USACE). <span style="float: right;">1 year</span></li> <li>3. Tentatively, hold an end-user group meeting to discuss results of #1.</li> </ol>

**Table 8. *Hui O Hana* Priority Action Items (cont'd.)**

Working Group	Recommended Activities
Data Management	<ol style="list-style-type: none"> <li data-bbox="414 401 1412 743">1. Convene a workshop of data providers and brokers to promote information exchange, awareness, access, and use of data related to hazard/risk management. Outcomes:               <ul style="list-style-type: none"> <li data-bbox="511 537 1209 569">◆ Inventory or catalog of disaster management data</li> <li data-bbox="511 573 714 604">◆ Data Model</li> <li data-bbox="511 609 1388 674">◆ Better access to data; best practices and common tools for data access</li> </ul>               (Lead: Eric Wong with working group of USGS, PDC, NOAA, UH) <span style="float: right;"><i>6 months</i></span> </li> <li data-bbox="414 747 1412 911">2. Convene a workshop of user community of risk managers to expose them to data and identify data gaps. Outcome: Familiarize risk managers with existing data sets. (Lead: Eric Wong with working group of USGS, PDC, NOAA, UH) <span style="float: right;"><i>1 year</i></span> </li> <li data-bbox="414 915 730 947">3. Create an e-mail list.</li> </ol>
Decision-Support Tools	<ol style="list-style-type: none"> <li data-bbox="414 968 1412 1205">1. Develop an inventory of existing decision-support tools, with a focus on identification of those currently in use or that could be of use in the Pacific. Following the completion of the inventory, the Decision-Support Tools <i>hui</i> may choose to conduct a more detailed assessment of the applicability of one or more of the tools in the Pacific Islands (e.g., their availability, data requirements, limitations) (Lead: PSC) <span style="float: right;"><i>1 year</i></span> </li> <li data-bbox="414 1209 1412 1572">2. Support current efforts to evaluate the applicability of FEMA's new HAZUS MH model in the Pacific. A review of the applicability of the HAZUS MH in Hawai'i has been initiated by the Hawai'i State Earthquake Advisory Committee Planning Sub-Committee through the development of a draft document entitled "Preliminary Summary of Issues and Comments Relating to Applications in the Pacific Region for Earthquake, Flood and Hurricane Loss Estimation and Related Information Products." They have expressed a desire for assistance from the Decision-Support Tools <i>hui</i> for broadening their existing analysis to other U.S. Affiliated Pacific Islands. (Lead: PSC, CSC, FEMA) <span style="float: right;"><i>1 year</i></span> </li> <li data-bbox="414 1577 1412 1709">3. Steer development of a Pacific Island version of HURREVAC model to make it a more robust hurricane decision-support tool, as opposed to just a tracking tool. (Lead: PSC, CSC) <span style="float: right;"><i>1 year</i></span> </li> <li data-bbox="414 1713 1412 1772">4. Coordinate with the other <i>hui</i> to optimize efforts and resources. (Lead: PSC) <span style="float: right;"><i>1 year</i></span> </li> <li data-bbox="414 1776 730 1808">5. Create an e-mail list.</li> </ol>

**Table 8. *Hui O Hana* Priority Action Items (cont'd.)**

<b>Working Group</b>	<b>Recommended Activities</b>
<p>Communications Infrastructure and Information Dissemination</p>	<p>Goal: Develop National “to the last mile” Communication Systems</p> <ol style="list-style-type: none"> <li>1. Develop an inventory of Communication Infrastructures; Investigate all aspects of two-way wireless communication in the Pacific (satellite, radio etc.). (Lead: Bryan Hodge) <span style="float: right;"><i>6 months</i></span></li> <li>2. Complete three RANET demonstration projects. (Lead: Garry Clarke) <span style="float: right;"><i>9 months</i></span></li> <li>3. Develop an inventory of proposed/ongoing projects with communication requirements; coordinate with Outreach, Education and Training and other <i>hui</i>. (Lead: Nicole Colasacco) <span style="float: right;"><i>1 year</i></span></li> <li>4. Create promotional materials to engage partners.               <ul style="list-style-type: none"> <li>◆ Target audience is broad, including regional institutions, decision makers</li> <li>◆ 1-page glossy brochure and more detailed paper document</li> </ul>               (Lead: ?? ) <span style="float: right;"><i>6 months</i></span> </li> <li>5. Conduct a National User-needs Workshop in Fiji. (Lead: Atu Kaloumaira) <span style="float: right;"><i>1 year</i></span></li> <li>6. Create an e-mail list.</li> </ol>
<p>Post-Disaster Evaluation</p>	<ol style="list-style-type: none"> <li>1. Draft a White Paper on Pacific Islands Hazards (including human-induced hazards) Experience Database. (Lead: Jim Buika) <span style="float: right;"><i>1 year</i></span></li> <li>2. Draft a White Paper on Post-Event Evaluation Tools (including human induced), after consulting with folks in the region:               <ul style="list-style-type: none"> <li>◆ What can be collected?</li> <li>◆ What is collected?</li> <li>◆ What should be collected?</li> </ul>               (Lead: Jim Buika) <span style="float: right;"><i>1 year</i></span> </li> <li>3. If there is a disaster, use it as a template. (Lead: PDC, FEMA, USGS, UH SSRI &amp; Decision Support and Data Management <i>hui</i>)</li> <li>4. Make HAZUS-MH more Island-appropriate. (Lead: David Kennard with support from PSC) <span style="float: right;"><i>1 year</i></span></li> <li>5. Create an e-mail list.</li> </ol>
<p>Education, Outreach, and Training</p>	<ol style="list-style-type: none"> <li>1. Work through agencies to secure commitment to reflect within the organization’s strategic plan annual action items to identify training for end-line users in Pacific jurisdictions as a priority.</li> <li>2. Advocate creation of multiagency education outreach board to serve as advocate for hazard mitigation education/outreach materials.</li> <li>3. Create e-mail list, to be used for training announcements and availability of materials.</li> </ol>

**Table 8. *Hui O Hana* Priority Action Items (cont'd.)**

Working Group	Recommended Activities
Traditional Knowledge and Practices	<ol style="list-style-type: none"> <li data-bbox="415 401 1406 533">1. Develop an inventory of information-gathering activities under way and completed, including an inventory of individuals and organizations doing this. (Leads: Atu Kaloumaira and Chris Chung) <span style="float: right;"><i>1 year</i></span></li> <li data-bbox="415 537 1406 604">2. Initiate a network of cultural practitioners (Leads: Chris Chung and Atu Kaloumaira) <span style="float: right;"><i>1 year</i></span></li> <li data-bbox="415 609 1406 676">3. Publish Web database. (Leads: Pene Lefale and Kris McElwee) <span style="float: right;"><i>1 year</i></span></li> <li data-bbox="415 680 1406 735">4. Communicate regularly via e-mail and in person (Chris Chung will take first step).</li> </ol>

To support the activities identified above, the NOAA Pacific Services outlined a list of tasks to be undertaken over the coming year.

1. Establish PRiMO Listserver *2 weeks*
2. Publish 2004 FHMPPI Meeting Proceedings *2 months*
3. Draft Joint Regional Action Plan *1 year*
4. Support PRiMO Activities via the *hui o hana* and facilitation of interim coordinating council meetings *1 year*
5. Convene a 2005 meeting of the (PRiMO) *1 year*

Task 1, establishing *hui* e-mail lists, has already been completed. This document represents completion of Task 2. Tasks 3 through 5 are considered further in Section 6.

Note that the name **Pacific Risk Management `Ohana (PRiMO)** has been established as a result of this process. This is intended to replace the term Federal Hazard Mitigation Partners in the Pacific Islands (FHMPPI).

## 6. ESTABLISHING A REGIONAL COORDINATING BODY: ASSEMBLING THE CREW

A draft resolution, which was circulated at the meeting, was tabled. (See Appendix G.) However, an interim coordinating council was formed. It is composed of at least two members from each *hui*. Designated *hui* steersman that make up the interim coordinating council are listed here:

### Coastal and Ocean Observations and Processes

- ◆ Jim Lewis
- ◆ Stan Boc

### Data Management

- ◆ Eric Wong
- ◆ Larry Kanda
- ◆ *Darcee Killpack*

### Data Analysis and Decision-Support Tools

- ◆ Adam Stein
- ◆ Dolan Eversole
- ◆ *John Marra*

### Communications Infrastructure and Information Dissemination

- ◆ Ed Young
- ◆ Nicole Colasacco

### Post-Disaster Evaluation and Performance Indicators

- ◆ Sally Ziolkowski
- ◆ Cheryl Anderson

### Education, Outreach, and Training

- ◆ Karen Rosa
- ◆ Jackie Burniske

### Traditional Knowledge and Practices

- ◆ Pene Lefale
- ◆ Atu Kaloumaira
- ◆ *Chris Chung*

*(alternates are listed in italics)*

Over the next 12 months, this group is tasked with oversight of *hui* activities, including tracking the progress of *hui o hana* priority action items identified in Section 5; assisting in the development of a draft joint regional action plan based upon the action plan goals and objectives outlined in Section 5; and assisting in the development of draft coordinating council policies and procedures. It is anticipated these items will be primary topics of discussion at the 2005 PRiMO meeting.