

# Summary Report of the Tsunami Hazard Mitigation Steering Group Meeting

May 10-11, 2000  
Seattle, Washington

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## Attendees

### Steering Group

Eddie Bernard - NOAA  
Richard Przywarty - NOAA  
Richard Hagemeyer - NOAA  
Craig Weaver - USGS  
Carl Cook - FEMA  
Michael Hornick - FEMA Region IX  
Roger Hansen - State of Alaska  
Scott Simmons - State of Alaska

Richard Eisner - State of California  
Lori Dengler - State of California  
Brian Yanagi - State of Hawaii  
Laura Kong - State of Hawaii  
George Crawford - State of Washington  
Timothy Walsh - State of Washington  
Mark Darienzo - State of Oregon  
George Priest - State of Oregon

### Guests

Steve Hammond - NOAA  
Robert Kamphaus - NOAA  
Frank Gonzalez - NOAA  
Chris Fox - NOAA  
Hal Mofjeld - NOAA  
Vasily Titov - NOAA  
  
Marie Eble - NOAA  
Jean Newman - NOAA  
Jana Goldman - NOAA/OAR Public Affairs

Charles McCreery - NOAA/PTWC  
Tom Sokolowski - NOAA/WC/ATWC  
David Oppenheimer - USGS  
Ted Buehner - WCM Seattle  
Lt Alan Yelvington - USCG  
Kerre Martineau - Alaska Dept.  
of Military & Veterans Affairs  
Costas Synolakis - USC

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## Overview

Dr. Bernard presented the introductory remarks and welcomed everyone to the Pacific Marine Environmental Laboratory. All attendees introduced themselves. The current budget status for the National Tsunami Hazard Mitigation Program was discussed. Available funds from the FY 2000 budget are \$2,028,000. Inundation Mapping: TIME will receive \$176,340 and the states of Alaska, California, and Hawaii will divide equally \$176,340. Warning Guidance Upgrades: Seismic upgrades will receive \$705,360 to install 26 sites and DART will receive \$617,190 to maintain 2 buoys and install 1 new buoy. Mitigation efforts will receive \$352,680 overall with the states equally dividing \$291,000. New developments will be discussed concerning landslide enhanced tsunami maps for southern California, the East coast tsunami concern, and the next five years or Phase II of the Program.

The Program is not included as a line item in the NOAA FY 2001 Budget although supported by Department of Commerce and the National Oceanic and Atmospheric Administration (NOAA); the Program was cut from the Presidential budget by the Office of Management and Budget.

**ACTION ITEM:** States were requested to send letters of support for the program for the FY 2001 budget to Congressional members in the next two weeks. **ACTION:** All states.

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## Review of action items from the previous meeting:

### Best Cell Size to use in Inundation Maps (requested by all)

**ACTION:** TIME Center to provide some numerical modeling guidance to Steering Group members.

**CLOSED:** Covered under Inundation Mapping section below

### States requested Adobe Acrobat (.pdf) version of TsuInfo Alert Newsletters be available on the web

**ACTION:** Connie Manson

**CLOSED** All TsuInfo Alert Newsletters for 1999 and 2000 are in .pdf format and are linked to our tsunami-hazard web page

### Steering Group request for an article on the multi-state partnership was needed for the TsuInfo Alert Newsletter

**ACTION:** Bernard, Eisner, Dengler

**CLOSED:** Article appeared in January-February 2000 edition of the newsletter

### Mitigation Subcommittee agreed to revisit the issue of how best to get tsunami warning information to end users

**ACTION:** Mitigation Subcommittee

**OPEN:** See Mitigation Action Item on MOA

## Draft of Tsunami Warning Systems: Guidance for State and Local Officials

A draft of the warning system guidance document was distributed to the Steering Group members for review in April. **ACTION:** Mark Darienzo/Local Warning Subcommittee

**OPEN**

### Public Affairs

Requested to put generic media kit on the web page

**CLOSED**

Divide list of tsunami videos by public/non-public domains on the web page.

**CLOSED**

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## Project Impact Presentation

Carl Cook, FEMA, made a presentation to the group on Project Impact. With Project Impact-Building Disaster Resistant Communities, FEMA is changing the way America deals with disasters. Project Impact helps communities protect themselves from the devastating effects of natural disasters by taking actions that dramatically reduce disruption and loss. Project Impact is basing its work and planning on three simple principles: preventive actions must be decided at the local level; private sector participation is vital; and long-term efforts and investments in prevention measures are essential. FEMA would like to have an operating plan for use in the aftermath of a tsunami event. The NSW helps to get on-site assessment after disasters.

**ACTION ITEM:** There was considerable discussion on how to confirm the availability of resources after a disastrous event. The group formed an ad hoc committee to formalize the next steps. This committee will consist of: Richard Przywarty, Frank Gonzalez, Eddie Bernard, George Priest, and Costas Synolakis.

**ACTION:** Richard Przywarty, Frank Gonzalez, Eddie Bernard, George Priest, and Costas Synolakis

## Underwater Landslides Presentation

Professor Costas Synolakis gave a presentation on underwater landslides and their effects, illustrated by animations of Skagway, Alaska; Ismir Turkey; and the San Clemente fault generated tsunami (Titov).

## NOAA Weather Radio Presentation

Ted Buehner, Warning Coordination Meteorologist, NWS, Seattle, gave a presentation on Washington NOAA Weather Radio. NOAA Weather Radio is a major way to reach the target audience in a timely manner with a tsunami watch/warning message. The most recent NOAA Weather Radio transmitter has just become operational in test mode on Mt. Octopus. This transmitter bridges the gaps in coverage caused by the terrain on the Washington coast. This station also provides Emergency Alert System reception to Forks, Washington, broadcasters. As soon as all licensing and leasing agreements are complete, the station will be fully operational.

Funding for this project was provided by the state tsunami warning group.

## [Develop NOAA/State Coordination and Technical Support](#)

The full windows version of the Historical Tsunami Data Base for the U.S. is almost complete. Work has begun on a beta version of the HTDB for the Caribbean.

## [Improve Seismic Networks](#)

All new stations will be installed by 2001. Delays have been caused by weather and equipment problems (slow to arrive or defective) as well as an underestimation of the manpower needed to install the new stations. The dedicated 128Kbps circuit from HVO to PTWC is now operational after many months of effort. This circuit allows PTWC to have access to continuous seismic waveforms for all CREST stations installed at HVO as well as most analog channels. The new Quake Data Distribution System (QDDS) was discussed. This new system is an on-line real-time reporting system. QDDS is designed as a hub and leaf system with two hubs, one in Menlo Park, California, and the other in Reston, Virginia. Much discussion ensued on how to word the messages that would go out with tsunami warnings and on how to get the quake information down to the city level. Discussion also focused on determining the best method for dissemination of quake information and on what information (on quakes below magnitude 6.5) states need.

**ACTION ITEM:** Develop state requirements for earthquakes below magnitude 6.5.

**ACTION:** Lori Dengler.

## [Deploy Tsunami Detection Buoys](#)

The DART test mooring (D123) was recovered off the coast of Monterey, California in February 2000. DART mooring D130 was deployed on March 21, 2000. To date, D130's data return rate has been 100%. Moorings deployed in October 1999 at D157 and D165 will be recovered and new moorings deployed in August 2000. One new mooring is planned for deployment at 175 degrees west longitude.

## [Produce Inundation Maps](#)

The inundation mapping progress report was given by Lt Kamphaus. Frank Gonzalez, co-director TIME, presented an overview of PMEL tsunami programs (National Tsunami Hazard Mitigation Program: TIME and DART moorings; NOAA: Facility for the Analysis and Comparison of Tsunami Simulations (FACTS), and DOD/NASA: Short-term Inundation Forecasting for Tsunami (SIFT). TIME's purpose is to assist Pacific states in the development, maintenance, and upgrade of inundation maps; to archive bathymetry and topographic data; and to develop computational bathymetry and topographic models. In January 2000, Vasily Titov became co-director of TIME and the center moved to PMEL at Seattle, Washington. Lt Kamphaus will be leaving for sea duty in early June and his replacement will not be in place until December 2000.

**ACTION ITEM:** The Steering group requested an assessment of lessons learned and how to go forward on where and how to map areas. **ACTION:** TIME to collect and summarize data.

At the last meeting, TIME agreed to attempt to summarize the existing knowledge on the best cell size to use for inundation mapping and provided the following conclusions/recommendations to Steering Group members: inundation computations (moving, not solid boundaries) are essential for producing the inundation maps; at least 150-100m cell size is required for inundation computations to produce useful guidance; models with 50-30m cell

size seem to capture most of the important local inundation features; and use the best resolution bathy-topo data available. **CLOSED**

## Mitigation

Mark Darienzo presented the Mitigation Subcommittee report covering state activities since the last meeting as well as budget issues and plans for the future.

**ACTION ITEM:** There was considerable discussion concerning a common plan (MOA) for mitigation procedures. The group decided to form a subcommittee to collect procedures now in place and analyze them and report back. The subcommittee will post their findings on tsuhaz by the end of June and report their next steps via conference call by the end of July 2000.

**ACTION:** The subcommittee members are: Mark Darienzo, Tim Walsh, Richard Eisner, George Priest, Gary Brown, Brian Yanagi, Michael Hornick, and Chris Jonientz-Trisler.

**ACTION ITEM:** States suggested that a web site be established to house Power Point presentations from all five states.

**ACTION:** States, PMEL

## Local Tsunami Warning Systems

**ACTION ITEM:** The third draft of the Tsunami Warning Systems: Guidance for State and Local Officials was given to Steering Group members for review and comments. Comments due May 31, 2000. **ACTION:** M. Darienzo, all Steering Group members.

Mark Darienzo reported that he would like to hold a workshop to discuss warning systems in general in the spring of 2001 in either Portland or Seattle. Final recommendations on local warning systems will come from the workshop next spring.

## Role of the U.S. Coast Guard in tsunami maritime response planning

Lt. Alan Yelvington briefed the Steering Group on the role of the Coast Guard in tsunami response planning for the maritime industry. Coast Guard missions include operations, marine safety, aids to navigation, and a Federal Response Plan. Customers include ports and harbors, commercial carriers, charter boats, fishing fleets, recreational boaters, and live-aboards. He covered the aspects of Federal Response Planning and customer needs as well as how the Coast Guard and other response teams can work together.

## Tsunami-Ready Community Proposal

Richard Przywarty, Director, NWS Alaska Region, briefed the group on a proposal for a "Tsunami Ready Community." The proposal is based on the NWS "Storm Ready Program" which has been quite successful. He proposed that the Steering Group as a body should endorse and codify a "Tsunami Ready Program." The designation as a "Tsunami Ready Community" would mean that a community has met a minimum standard of tsunami education, awareness, and preparation and has been awarded the "Tsunami Ready Community" designation. The objectives of the Tsunami Ready Program would be to promote an active partnership in promoting tsunami awareness in the emergency management and the general community. The Program would

establish a Tsunami Ready certification process and create a certifying board. The benefits of the program are that the communities would be recognized by a national body of scientific experts, the community would be at least more aware and better ready in the event of a tsunami, it would receive a visual certificate, and have access to funding sources not available otherwise.

**ACTION ITEM:** By our November Steering Group meeting: Richard Przywarty will prepare a short implementation plan based on Lori Dengler's Strategic Implementation Plan for Tsunami Mitigation Projects (NOAA Technical Memorandum ERL PMEL-113).

**ACTION:** Each state, agency that has information and suggestions on how to make the Tsunami Ready Program work, send the information to Richard Przywarty as soon as possible. Richard Przywarty will draft a straw plan and e-mail it to the Steering Group requesting points of contact. He will collaborate with Lori Dengler on the plan.

## Alaska Tsunami Sign Program

Scott Simmons reported on the sign program in Alaska. He showed various adaptations of the sign developed to meet special needs such as evacuation sites and shelter locations.

## Public Affairs Report

Ann Thomason presented the highlights of the Program's Media Coverage since the October 1999 meeting (copies given to each member). Jana Goldman asked that the group members keep her and Ann Thomason informed when they meet/talk to media. Jana will e-mail the tsuhaz list to inform everyone of upcoming media events, opportunities, articles, etc. Jana also said she would try to help us get a tsunami b-roll and will add this item to her budget request for next year. Jana also put in her FY 2001 budget a request for \$1000 for development of a tsunami rolodex card for reporters with contact information and our web site address. Kerre Martineau, State of Alaska, discussed the upcoming (previously postponed) Sitka sign dedication, newly developed educational materials (pens, mouse pads, pamphlets, etc.), and other public affairs activities in the State of Alaska. The State of Washington is putting the finishing touches on a 30 second Public Service Announcement which was shown to the Steering Group for comments. California has held five workshops on map projections and the Local Tsunami Response Guidance document. (See Tsunami Mitigation Subcommittee Report for other mitigation/education/public affairs activities).

**ACTION ITEM:** The Steering Group requested that we do other backgrounders on tsunami issues. Specific issues need to be selected.

**ACTION:** Steering Group to determine issues for backgrounders, PAWG to create and post backgrounders on web site.

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## The Next Five Years (Phase II-sustained efforts)

The Tsunami Hazard Mitigation Plan calls for assessment of the Tsunami Hazard Mitigation Program after 5 years. To fulfill this requirement, the first day of the International Tsunami Symposium in August 2001 will be devoted to a review of the Tsunami Hazard Mitigation Program. The program will be reviewed by tsunami experts. In order to obtain reviewers 6-9 months in advance an ad hoc subcommittee is needed.

**ACTION ITEM:** Ad hoc subcommittee to be named by Bernard to nominate reviewers.

**ACTION:** Bernard

## **FY 2001 Budget:**

Plan for a \$2.3m budget. We should be able to meet the targets in the plan except for mapping.

**ACTION ITEM:** All programs/states were asked to draft their 2001 budget numbers and submit them to Eddie Bernard by July 31, 2000. Eddie will compile the figures and redistribute them to all members. Final budgets should be ready for presentation at the Subcommittee meeting in November.

**ACTION:** All

## **NSF Modeling Support:**

George Priest stated that the program needs more ongoing support for modeling. He suggested that perhaps NSF could designate a program for tsunami modeling research to which modeling proposals could be written.

**ACTION:** E. Bernard to contact C. Astill at NSF concerning this suggestion.

## **Meeting Dates and Locations for 2000**

May 9-11, 2000, PMEL, Seattle, Washington

November 14-16, Hilo, Hawaii

## **Change in Format For November Meeting**

The Mitigation Subcommittee requested that the meeting format be altered at the November meeting so that the Subcommittee meets from 8 a.m. to 12 noon on Tuesday, November 14. The full Steering Committee meeting would then begin at 1 p.m. on Tuesday, November 14 and run through Wednesday, November 15. Thursday, November 16 would be a day for field trips. The group agree to this change in format.

# Summary Report of the Tsunami Hazard Mitigation Steering Group Meeting

November 14-15, 2000  
Hilo, Hawaii

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## Attendees

### Steering Group

Eddie Bernard - NOAA	Lori Dengler - State of California
Chris Jonientz-Trisler - FEMA	Brian Yanagi - State of Hawaii
Michael Hornick - FEMA IX	Laura Kong - State of Hawaii
Craig Weaver - USGS	Mark Darienzo - State of Oregon
Gary Brown - State of Alaska	George Priest - State of Oregon
Roger Hansen - State of Alaska	George Crawford - State of Washington
Richard Eisner - State of California	Tim Walsh - State of Washington

### Guests

Frank González - NOAA	Delores Clark - NOAA/NWS Public Affairs
Vasily Titov - NOAA	Gerard Fryer - U of H Manoa
Charles McCreery - PTWC	Michelle Teng - U of H Manoa
Tom Sokolowski - WC/ATWC	Kwok Fai Cheung - U of H Manoa
Michael Blackford - ITIC	George Curtis - U of H
Stan Goosby - PDC	Dan Walker - HI Civil Defense
Lt Alan Yelvington - USCG	Zygmunt Kowalik - U of AK
David Oppenheimer - USGS	J. Larry Mintier - J. Laurence Mintier & Associates



## **Review of action items from the previous meeting:**

**1. There was considerable discussion on how to confirm the availability of resources after a disastrous event. The group formed an ad hoc subcommittee to formalize the next steps. The subcommittee consists of: Richard Przywarty, Frank González, Eddie Bernard, George Priest, and Costas Synolakis.**

**ACTION:** The committee was to research and formalize the next steps.

**OPEN:** Three new members were added to the subcommittee: Mike Hornick, Chris Jonientz-Trisler, and Richard Eisner. There was a discussion of what role the National Tsunami Hazard Mitigation Program Steering Group would have in tsunami disaster response. NOAA currently has no input in times of disaster. The current National Post-Storm Data Acquisition Plan provides only for data collection. Mike Hornick, FEMA Region IX proposed a 2-step action plan: 1) The Federal Response Plan needs a tsunami action plan. Mike Hornick and Chris Jonientz-Trisler and FEMA HQ need to develop this plan, and 2) the States need defined data collection activities. The subcommittee will review the NOAA Response Plan document and how it interacts with the states and report at the next meeting.

**2. Develop state requirements for earthquakes below magnitude 6.5.**

**ACTION:** Lori Dengler

**CLOSED:** Lori has queried emergency managers in California, Oregon, and Washington and the general response was that no additional information is needed at this point. [See report.](#)

**3. The Steering Group requested an assessment of lessons learned and how to go forward on where and how to map areas.**

**ACTION:** TIME to collect and summarize data.

**CLOSED:** TIME prepared an assessment report of [lessons learned](#) and this was provided to each member and guest at the meeting. He discussed the findings with the group. [See mapping below.](#)

**4. There was discussion concerning a common plan (MOA) for mitigation procedures. A subcommittee was formed to collect current procedures, analyze them, and report at the next meeting.**

**ACTION:** The subcommittee: Mark Darienzo, Tim Walsh, Richard Eisner, George Priest, Gary Brown, Brian Yanagi, Michael Hornick, and Chris Jonientz-Trisler.

**CLOSED:** The group felt this was a duplicate of action item number 1 above and deleted the item.

**5. States suggested that a web site be established to house PowerPoint Presentations from all five states.**

**ACTION:** States, PMEL

**ONGOING:** PMEL Computer Services has been contacted on providing server space for this project. They suggested using jpg or gif images rather than PowerPoint images to avoid compatibility problems between systems and versions of PowerPoint. PMEL has begun their image library and will continue to add to it. Due to the large storage capacity needed for image files, it was suggested that states and agencies outside PMEL host their own sites for their image libraries and PMEL would link to them from a new Image Library web page on our tsunami-hazard web site.

**6. The third draft of the Tsunami Warning Systems: Guidance document for State and Local Officials was given to Steering Group Members at the last meeting for review and comment by May 31, 2000.**

**ACTION:** Mark Darienzo and all Steering Group Members

**CLOSED:** The final draft of the document was shown to Steering Group Members. Mark Darienzo will publish and place on their web site.

**7. Richard Przywarty to prepare a short implementation plan based on Lori Dengler's Strategic Implementaiton Plan for Tsunami Mitigation Projects and present at the November meeting.**

**ACTION:** States and agencies with information on how to make the Tsunami Ready Program work, please foward this information to Richard Przywarty. R. Przywarty will draft a straw plan and e-mail it to Steering Group members requesting points of contact. He will collaborate with L. Dengler on the Tsunami Ready Plan.

**OPEN ONGOING:** The Tsunami Ready Program was presented to the Steering Group by Tom Sokolowski ([see item below](#)). R. Przywarty, T. Sokolowski, L. Dengler will continue to refine this Program.

**8. The Steering Group requested that PAWG prepare other backgrounders on tsunami issues. Specific issues need to be selected by the Steering Group.**

**ACTION:** Steering Group to determine issues for backgrounders, PAWG to create and post backgrounders on web site.

**CLOSED:** PAWG members were contacted and no new backgrounder issues have been requested.

**9. Ad hoc subcommittee to be named by Bernard to nominate reviewers for the August 2001 review.**

**ACTION:** Bernard

**CLOSED:** Reviewers named are: Hiroo Kanamori, Dennis Milletti, Phillip Liu, Douglas Luther, and Richard McCarthy.

**10. All programs/states were asked to submit their 2001 budget numbers to E. Bernard by July 31, 2000. Final budgets will be presented at the November meeting.**

**ACTION:** All

**CLOSED:** All budgets were presented and discussed at the November Steering Group Meeting.

**11. George Priest stated that the program needs more ongoing support for modeling. He suggested that perhaps NSF could designate a program for tsunami modeling research to which modeling proposals could be written.**

**ACTION:** E. Bernard to contact C. Astill at NSF concerning this suggestion.

**CLOSED:** E. Bernard made contact with C. Astill. No such program can be officially nominated. E. Bernard suggested that as we are doing community modeling, the scientist doing the modeling could submit a proposal to NSF at the same time.

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## Overview

Eddie Bernard discussed the funding history of the program and the current FY 2001 budget. The Program is not included as a line item in the NOAA FY 2001 Budget although supported by Department of Commerce and the National Oceanic and Atmospheric Administration (NOAA). The President has vetoed the current Department of Commerce, Justice, and State budget meaning that NOAA is under a continuing resolution until December 5. The House/

Senate Conference Report included \$2,300,000 for the Program. If there are no changes in the conference report and the Commerce, Justice and State budget is signed into law, available funds for the Program's FY 2001 budget are \$2,070,000 after the 10% NOAA tax.

## [Develop NOAA/State Coordination and Technical Support](#)

The final Windows version of the HTDB/US program is currently being checked. A new operating manual is being prepared and reviewed.

## [Improve Seismic Networks](#)

The Consolidated Reporting of EarthquakeS and Tsunamis (CREST) showed that during the past 6 months no new activity has been conducted at the Warning Centers except for support of telemetry links. Installation of seismic instrumentation continued as weather and equipment inventories permitted. David Oppenheimer briefed the group on what it takes to install a seismic station and discussed the reasons why stations are not installed yet: staff shortages as staff time was not budgeted in the FY 2000 budget, new equipment replacing old microwave equipment, and implementation issues.

## [Deploy Tsunami Detection Buoys](#)

Three DART buoys were recovered and three were deployed in August 2000. There are now 4 DART systems deployed and operational. DART systems are transmitting real-time data with an estimated system return of greater than 95 percent. The PMEL Engineering Development Division is working on a new BPR printed circuit board design to replace electronic components that are no longer commercially available. A prototype is now being developed and will be ready for testing in Spring 2001. The Tsunami Warning Centers are receiving the data transmissions from the DART buoys via the GOES satellite. They also receive the data via the web. When the systems triggered either through scheduled tests or actual earthquake events, the system worked exactly as designed.

## [Produce Inundation Maps](#)

Frank González gave his report on the [lessons learned](#) and how to proceed from here. He also distributed copies to the members. The assessment pointed out three lessons learned: 1) The National Tsunami Hazard Mitigation Program maps have been accepted by communities and are proving to be useful emergency management tools, 2) mapping costs are higher than originally thought, and 3) production of maps is delayed by grid construction and source specification uncertainties. Recommendations include: 1) improve computational grid development, 2) develop standard methodology and tools with user-friendly interfaces, and 3) put into place a web-based interface so users can see what, if any, data is available. The

direction that TIME should go in the future is to be less of a grid supplier and focus on providing modelers with raw data and quality control.

George Crawford provided an agenda, list of participants, and purpose for the Puget Sound Tsunami/Landslide Workshop will be held January 23-24, 2001, in Seattle at the NOAA Sand Point campus (Bldg. 9). The Workshop is a partnership of NOAA/PMEL, USGS, and Washington State Emergency Management. The goal of the workshop is to develop an action plan to generate tsunami inundation maps and other tsunami/landslide mitigation products for Puget Sound communities. The workshop arose from discussions at the last Steering Group Meeting in May 2000 at PMEL.

**ACTION ITEM:** States and TIME are to decide on division of mapping projects funding for FY 01 so that Frank González can provide the mapping budget by December 1, 2000.

**ACTION ITEM:** Hal Mofjeld (PMEL) to provide a short tutorial on tsunami wave forms to tsuhaz prior to the May 2001 Tsunami Workshop in Portland, Oregon.

## Mitigation

Highlights of the state mitigation efforts since the May 2000 meeting were discussed. Tsunami hazard signs have been installed in Homer and Seward, Alaska, as well as in a remote area frequented by kayakers and inundated in 1964. Earthquake effects are linked with tsunami education through "Shake Cottage" demonstrations at fairs. This "Cottage" is a "media magnet" and MSNBC has requested an interview with the Alaska Department of Emergency Services. California's inundation maps and landslide data has drawn considerable southern California media attention. Larry Mintier presented the latest version of Tsunami Hazard Mitigation Guidelines, a multi-state project led by California. Hawaii is developing a post-tsunami data survey tool using IOC guides. The state video was completed and shown to the group during the meeting. Oregon has continued with evacuation planning and brochure development as well as surveying communities on tsunami sign problems. Washington presented several new education products including a tsunami evacuation public service announcement and curriculum for K-6 and 7-12. The Subcommittee Coordinator will rerun and expand the 1994 baseline survey to measure performance.

**ACTION ITEM:** Chris Jonientz-Trisler will rerun and expand the 1994 baseline survey to measure performance. The results of this survey will be compared to the 1994 baseline survey and the results presented at the August 2001 review of the program.

**ACTION:** Chris Jonientz-Trisler

The Subcommittee Activities Matrix and Program Gaps were discussed as well as the FY 01 budget. The budget discussion was incomplete.

**ACTION ITEM:** The Subcommittee Coordinator indicated the budget discussion would be finalized during a conference call with all subcommittee members as soon as possible.

**ACTION:** All Mitigation Subcommittee members

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## **Local Tsunami Warning Systems and Procedures: Guidance for Local Officials**

Mark Darienzo reported on this open item from last meeting. The final draft of the report dated October 23, 2000, was distributed to the Steering Group members. The report has been reviewed by emergency managers in the states. Comments from the emergency managers indicated this guide would be useful to them. This document will become a living document, updated as new technologies are developed. Mark Darienzo asked Steering Group members for any final comments they may have. He also indicated that he will place the final document on the Oregon web site.

**ACTION ITEM:** Steering Group members to send any final comments on the guidance document to him not later than January 1, 2001.

**ACTION:** Each Steering Group Member

**ACTION ITEM:** Final Local Tsunami Warning Systems and Procedures: Guidance for Local Officials document to be placed on the Oregon web site prior to the May 14-15, 2001 workshop and Steering Group meeting.

**ACTION:** Mark Darienzo

## **Tsunami Workshop**

Mark Darienzo has planned a Tsunami Workshop for local emergency managers for May 14-15, 2000. The group agreed to hold the workshop on May 14-15 and to follow the Workshop with next the Steering Group meeting on May 16-18. It was agreed that the Warning Center Geophysicists in Charge would attend the workshop to help clarify warning center messages and when to issue the all clear. Mark Darienzo did a cost comparison between having the workshop in Seattle using the NOAA facilities or having the workshop at the Portland Airport Sheraton Hotel. Costs for workshop participants were less if the workshop were held at the Airport Sheraton Hotel. The Steering Group members agreed to hold the workshop at the

Portland Airport. A draft agenda for the workshop was distributed. The Steering Group meeting itself could be held at the Portland NWS SFO or at the DOGAMI offices.

**ACTION ITEM:** All Steering Group members are to send comments on the proposed workshop agenda to Mark Darienzo. Mark Darienzo will contact state emergency managers for names of people to invite to the workshop and will arrange for the meeting sites for the workshop and Steering Group meeting.

**ACTION:** All Steering Group Members, Mark Darienzo

## **Tsunami Ready Community Program**

Tom Sokolowski, Geophysicist in Charge of the West Coast/Alaska Tsunami Warning Center presented the draft of the Tsunami Ready Community Program prepared by Richard Przywarty in response to the action item from last meeting. The Tsunami Ready Community Program is modeled after the National Weather Service (NWS) Storm Ready Program. The program objectives are to promote tsunami hazard preparedness as an active partnership between the emergency management agencies, the public, and the NWS tsunami warning system. The main goal is improvement of public safety in tsunami emergencies. The Tsunami Ready Program establishes minimum criteria for a community to be awarded the Tsunami Ready certification. Communities accepting the challenge and meeting the requirements set by the NWS Tsunami Ready Program are designated as Tsunami Ready Communities. Communities are chosen based on community interest, accessibility, size, vulnerability, and community needs. Communities benefit because they are more prepared and their position is improved for receiving State and Federal funds. The draft requires further refinement and a subcommittee consisting of Richard Przywarty, Tom Sokolowski, and Lori Dengler was appointed to continue working on the draft of the program.

**ACTION ITEM:** Continue to refine the draft Tsunami Ready Community Program proposal.

**ACTION:** R. Przywarty, T. Sokolowski, L. Dengler

**ACTION ITEM:** Each State is to recommend one pilot community for the program by January 1, 2001.

**ACTION:** Each State

## **Public Affairs Working Group Report**

The members of the Public Affairs Working Group (Delores Clark, Jana Goldman, Marilu Trainor, and Ann Thomason) prepared and distributed the PAWG report for FY 2000. The

program has received considerable media attention during the year.

## **Review of the Last 5 Years and Plans for the Next 5 Years**

(Phase II-sustained efforts) The Tsunami Hazard Mitigation Plan calls for assessment of the Tsunami Hazard Mitigation Program after 5 years. To fulfill this requirement, the first day of the International Tsunami Symposium in August 2001 will be devoted to a review of the Tsunami Hazard Mitigation Program. The program will be reviewed by tsunami experts.

Eddie Bernard presented a draft outline of Phase II of the National Tsunami Hazard Mitigation Program for discussion. This draft outline included a review of Phase I accomplishments and recommendations based on the original National Tsunami Hazard Mitigation Plan. Deficiencies need to be addressed as well as recommended activities to correct these deficiencies. Deficiencies were identified in response, recovery, and data collection. The need to expand beyond the 5 original states in the program and to coordinate with other agencies were also identified as deficiencies. Each Steering Group member was asked to prepare their program reviews of the last 5 years for presentation at the May 2001 meeting.

**ACTION ITEM:** In preparation for the review in August 2001 and keeping in mind the original Tsunami Hazard Mitigation Plan, each Steering Group member should prepare a presentation for the May 2001 Steering Group Meeting that focuses on 1) what did you promise to do? 2) what did you do? and 3) what impact did it have?

**ACTION:** Each Steering Group Member

The plan for the next 5 years includes the three information bodies from Phase I Mitigation: the International Tsunami Information Center, the Pacific Tsunami Museum, and Connie Manson's TsuInfo Alert Newsletter. Recommended activities for the future include warning operations, mapping, mitigation, developing a response scenario, recovery, and data collection. An organizational structure and budget need to be determined; therefore, each Steering Group member was asked to think about their expectations for the next 5 years.

**ACTION ITEM:** Each Steering Group member is to prepare a summary of their expectations and budgets for the next 5 years. (In other words, where do you want to be at the end of the next 5 years?)

**ACTION:** Each Steering Group Member

## **FY 2001 Budget**

For FY 2001, \$2.3 million has been appropriated for the Program. There is an add-on of \$1



million for the Tsunami Warning and Environmental Observatory for Alaska (TWEAK), a letter of intent by Ray Highsmith at the University of Alaska. It was suggested that Ray Highsmith include Roger Hansen and Sigmund Kowalik in writing the proposal for TWEAK. TWEAK calls for a buoy in shallow water and the current DART buoys are not designed to operate in less than 1000m of water. Development of a buoy for TWEAK would depend on receiving funding up front. There is a shortfall of \$230K for FY 2001 for buoys. Eddie Bernard proposed and the Steering Group approved shifting \$220K from the CREST seismic program, which has an underrun, to cover the buoy shortfall. Mapping is short on funds this year and it was suggested that the mapping funds should be at least doubled in the next five year plan. This year there is a TIME shortfall of \$82K which may be absorbed by PMEL. A discussion of the question of how to report the mapping effort pointed out the difficulties of this issue and a method agreeable to all must be developed.

**ACTION ITEM:** Frank González and the States were asked to discuss and agree on the method of reporting the inundation mapping effort no later than March 2001.

**ACTION:** Frank González and States

## **Presentations**

Distant Tsunami Modeling - Dr. K. Fai Cheung

Local Tsunami Modeling - Dr. Gerard Fryer

Tsunami Coastal Recorders - Dr. Daniel Walker

## **Meeting Dates and Locations for 2001**

May 14-15 Tsunami Workshop, Portland, Oregon

May 16-18 National Tsunami Hazard Mitigation Program Steering Group Meeting, Portland, Oregon

August 7-9 International Tsunami Symposium, University of Washington, Seattle, Washington  
(The NTHMP Review on August 7 will replace our normal fall meeting)