

# **Summary Report of the Tsunami Hazard Mitigation Steering Group Meeting April 27-30 1999 Arcata, California**

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## **Attendees**

### **Steering Group**

Eddie Bernard - NOAA

Robert Kamphaus - NOAA

Richard Hagemeyer - NOAA

Chris Jonientz-Trisler - FEMA

Roger Hansen - State of Alaska

Gary Brown - State of Alaska

Richard Eisner - State of California

Lori Dengler - State of California

Brian Yanagi - State of Hawaii

Augustine Furumoto - State of Hawaii

George Crawford - State of Washington

Timothy Walsh - State of Washington

### **Guests**

Dr. Alistair McCrone, President, HSU

Mike Shore - FEMA

Mike Mahoney - FEMA

Robert Olson, President, Robert  
Olson Associates, Inc.

Jeanette Mullin - FEMA

John Lovegrove - NWS

Costas Synolakis - USC

David Oppenheimer - USGS

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## **Field Trip to Study Tsunami Hazard Mitigation**

# Issues in the Humboldt Bay Region

The field trip (May 27, 3:30 to 6:30 p.m.) focused on the Humboldt Bay Region, population about 75,000. This area is featured in the CDMG planning scenario which describes, in a general way, the ground shaking effects, tsunami inundation (from NOAA modeling), and the effect on infrastructure of a Cascadia earthquake. The entire Humboldt Bay region sits about 8 miles above the Cascadia megathrust. Stops on the field trip included: (1) Mad River Slough---the edge of the mapped tsunami inundation zone and also one of Gary Carver's paleoseismology sites. One of the two primary water supply lines to Eureka crosses the slough in this area. The slough is a saltwater marsh which shows repeat submergence events tied to movements on the Little Salmon fault. This is a different source of submergence that may not be familiar. From mid-Oregon north, the elastic relaxation caused by the primary fault slip is expected to cause submergence--similar to what was seen in Alaska and Chile. In northern California, our coast is expected to go up due to the primary rebound because we are so close to the subduction zone margin. However, life at the edge is more complicated. There are numerous secondary folds and faults exposed near the coast which make up the Cascadia fold and thrust belt. The best studied of these is the Little Salmon fault which apparently slips in sympathy with each megathrust event. Little Salmon slip causes a deepening of the syncline which runs under Humboldt Bay, causing repeat submergence events. (2) Manilla Community Center, Samoa Peninsula. This is an example of the high dune region on the northern part of the Samoa Peninsula within the mapped inundation zone. (3) LP pulp mill, Samoa Peninsula. The central, industrialized core of the peninsula where the peninsula is less than 3000 feet in width and elevations average about 10-20 feet. Winter storm waves typically cover this part of the spit a few times a year. (4) Bayshore Mall, Eureka. The major commercial district in Eureka sits adjacent to the tank farms and at the narrowest part of Humboldt Bay. The local Fire Chief, heads of PG&E, and the head of the Humboldt Bay Municipal Water District were invited to address the group.

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## Overview

Dr. Alistair McCrone, President of Humboldt State University (HSU) presented the introductory remarks and welcome. Dr. Bernard presented him with a National Tsunami Hazard Mitigation Program mug.

Richard Eisner acknowledged Dr. McCrone's leadership and support of the seismic and tsunami programs. HSU has just dedicated its Emergency Operations Center and instituted a new course on the curriculum that will use the new room in coursework exercises.

# Papua New Guinea (PNG) Aftermath

Lori Dengler and Jane Preuss spent 10 days in PNG surveying the aftermath of the PNG tsunami. There is still much confusion on the exact cause of the PNG tsunami, however, it now appears that a slump may have enhanced the tsunami. The timing of the earthquake and tsunami coincided with the beginning of a 4-day holiday so people were at home in the villages on this Friday evening getting ready for the holiday. The location of the villages on a long, narrow, flat spit between the ocean and the lagoon further exacerbated the impact. Some important points were learned from the survey: (1) Oral tradition is an important mitigation tool, (2) 24-hour emergency relief is essential, and (3) inadequate assessment of damage slows response.

## Review of action items from the previous meeting:

The cataloging of the library at the International Tsunami Information Center (ITIC) is in progress

**ONGOING ACTION:** Mike Blackford

### **Historical Tsunami Database for the U.S. Pacific Coast (HTDB/US).**

Work on the development of the HTDB/US continues. A number of new things have been added which will be demonstrated later. The program will be introduced to the county level emergency managers at a meeting scheduled for Seattle on May 20. **OPEN:** Richard Hagemeyer

### **Enhanced web page presentation of the mitigation subcommittee report**

Preparation of the Status Report for publication has taken precedence over web page enhancement discussions. As soon as the Status Report is published, work will begin on the web page. Copies of the draft Status Report were distributed at the April meeting for review. **OPEN ACTION:** Chris Jonientz-Trisler.

### **Local Warning Subcommittee progress report**

The contract for the warning system guidance document has been awarded to Robert Olson Associates, Inc., and they have started work (created list of contacts, developed questionnaire) and will be in contact with the subcommittee members for input. Robert Olson attended this meeting and presented a progress summary **OPEN ACTION:** Mark Darienzo/Local Warning Subcommittee

### **PAWG Project to prepare video for anniversary of 1964 Alaska earthquake/tsunami and update press kits**

Funding was not received in time to produce the video as planned, however, a media advisory was issued nationally about the anniversary of the 1964 Alaska earthquake/tsunami. Local and regional press picked up the story but no national coverage was done. NOAA Tsunami Press kits have been updated at OAR Public Affairs. **CLOSED**

**Issues raised concerning Jim Lander's Tsunami Forecast for the Next 100 Years article in *Time* magazine.**

Eddie Bernard spoke with David Berkely of *Time* magazine who reported that the tsunami story was condensed to one chart and appeared only in the international edition of *Time*. The editor basically turned down the story. He will visit our web page and try to increase the interest of his editor for a future story. **CLOSED**

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

Richard Hagemeyer demonstrated the Historical Tsunami Database. This version will be demonstrated at the May 20 Emergency Managers' Meeting in Seattle, Washington. The Windows version of the program should be available soon and will be added to the NWS Pacific Region FTP site as soon as testing is completed. TSUHAZ will be notified when it is available on the FTP site. The [list of WCMs and CCEMs](#) has been updated and the use of EMWIN continues to expand.

## [Deploy Tsunami Detection Buoys](#)

Eddie Bernard reported on the status of the tsunami detection buoy program. The September buoy deployment operated for 86 days with 96.3% data return but was vandalized on Christmas day. Engineering modifications have been made as a result of the test and we plan to deploy a buoy in Monterey Bay, California, for a six-month test in May 1999. Data from the Monterey buoy will be posted on the real-time web site. We plan to deploy 4 systems--2 in Alaska and 2 off the West Coast of the U.S. in September/October 1999.

## [Produce Inundation Maps](#)

Lieutenant Robert Kamphaus gave a report on [inundation mapping for Oregon, Alaska, California, and Washington](#) . Mapping for Newport and Seaside, Oregon, have been completed. Maps in progress for Oregon include Gold Beach, Warrington-Astoria, and Coos Bay. Willapa Bay/Long Beach, Washington, maps are complete. Washington maps in progress include Gray's Harbor and Port Angeles/Port Townsend. California maps in progress include the San Francisco

area, the Santa Barbara area, and the San Diego area. For Alaska, the Kodiak area mapping is in progress. For Hawaii, the Request for Proposals is on the street.

## Develop Hazard Mitigation Programs

Chris Jonientz-Trisler presented the mitigation report. Each state gave a brief report on their activities. The 1998 Annual Mitigation Subcommittee Report draft was given to Steering Committee members for review. Chris Jonientz-Trisler asked that respondents e-mail comments to her prior to publication. It is attractive, explains the program, and shows successes. Its target audience would be interested communities and Congressional members/staffers. The matrix will be incorporated into the annual report as well as descriptions of the multi-state projects with color photographs and graphics. The goal is to highlight projects per state and how they are tied to the Mitigation Strategic Plan.

The Mitigation subcommittee determined that there are two gaps in mitigation efforts that need to be addressed: (1) dealing with loss estimations and (2) incorporating tsunami into all-hazard planning. Project Impact (FEMA) can be valuable as an interagency coordination tool for direct pass-through to communities.

In Washington state, NOAA Weather Radio has been expanded through coordination among the National Weather Service, Emergency Management Division, coastal counties, the coastal Native American tribes and U.S. Navy. When the expansion is operational in August 1999, NOAA Weather Radio will be available to the entire Washington coast. Washington will also be printing brochures with evacuation maps and putting evacuation maps and procedures into the local telephone directories and other local media. The National Tsunami Hazard Mitigation Program *TsuInfo Alert* newsletter has been in publication since the first of the year and has proved to be a very useful tool. The possibility of putting the newsletter on the web was discussed. Copies of Brian Atwater's booklet, *Tsunami Survival* will be available from George Crawford when published. The Cascadia Regional Earthquake Working Group (CREW) will be sponsoring forums in Oregon and Washington communities to bring local emergency managers and businesses together to partner against hazards that exist in the community.

Brian Yanagi showed a video prepared by a Hawaiian television station for Tsunami Awareness Month (April). Historic footage was furnished by the Pacific Tsunami Museum and there were many interviews with survivors of the 1946 and 1964 tsunamis in Hawaii.

Richard Eisner reported that the State of California is preparing a Local Planning Guide on Tsunami Response that will become an official California document. The Request for Proposal guidance on land use planning is being reviewed and the selection of a contractor is due in the next two weeks.

In Alaska, a contractor has been identified to make tsunami evacuation signs for Sitka, Alaska. The next three communities to receive signage should be identified soon. The DOGAMI pamphlets have been distributed to many Alaskan communities. Gary Brown has given several tsunami preparedness presentations at the local level. Alaska will continue to develop community database information.

States discussed the future of models and mapping. Suggestions for gathering mapping information included one on working with the Department of Defense and possibly getting a pilotless drone to get real-time coastal photos for mapping and modeling purposes.

The Local Warning Subcommittee has hired a private contractor, Robert Olson Associates, Inc., to gather data and develop a document for everyone's use based on the statement of work. Mr. Olson gave copies of the questionnaire he has prepared for this project as well as a copy of the project planning guide. The Project Objective is to provide guidance to local and state governments in five states that can be used to improve or develop new public tsunami warning systems, procedures, and methods. Mr. Olson also want to develop a performance standard for the project by determining the ideal desired behavior under both local and distant tsunami warnings. Key issues that need to be addressed are (1) who is responsible for establishing and maintaining systems and issuing warnings? and (2) What is the information path from the states to the local communities and the timing of information transmission will be studied?

## [Improve Seismic Networks](#)

David Oppenheimer reported the U.S.G.S. has completed the installaion of the CREST communications and computing system at the Pacific Tsunami Warning Center (PTWC). Another CREST communications and computing system has been installed at the Hawaii Volcano Observatory with data transmitted continuously to the PTWC via the Internet. The CREST network is basically completed, however, installation of upgraded stations has been slow due to equipment delivery problems and software interface problems. Another 16 stations should be in place by this fall. Equipment has been purchased for 37 sites. A station will be installed at Newport, Oregon. The National Earthquake Hazard Reduction Program has been reauthorized. A Seismic Detection Working Group was formed to explore the use of strong motion data for quick detection of location and dissemination of small earthquakes. The Working Group consists of D. Oppenheimer, R. Hansen, R. Hagemeyer, and L. Dengler.

## [Public Affairs Working Group Report](#)

Ann Thomason presented the Public Affairs Working Group (PAWG) Report. All states have been active in outreach activities. The National Weather Service issued a media advisory to national press regarding the 35th anniversary of the 1964 earthquake and tsunami. The media

advisory generated local media coverage in Alaska and Washington. A media advisory to national press on this Steering Group meeting was picked up by the Associated Press and resulted in interviews of L. Dengler and E. Bernard by two Eureka television stations: KIEB (NBC) and KVIQ (CBS), and by the local *Times-Standard* newspaper. A discussion ensued on two items the Steering Group would like to see produced by the Public Affairs Working Group. (1) the need for a more organized access to tsunami videos. The PAWG is to work up a budget for this and present it at the next meeting. (2) A generic media kit that local areas can take and localize by adding their materials to the generic kit. A draft generic media kit is to be presented at the next Steering Group meeting in October. **ACTION:** PAWG

## Local Tsunami Warning Systems

Mark Darienzo joined the group by telephone from his office in Oregon. The Local Tsunami Warning Systems Subcommittee has let the contract for the warning system guidance document to Robert Olson Associates, Inc. Mr. Olson presented a brief overview of the status of this project. The project objective is to develop a document primarily for use by local and five state governments to improve or develop new, locally-activated, consistent public tsunami warning systems, procedures, and methods. A Data Collection Guide has been prepared and sent to government officials in the five states. When completed Data Collection Guides are returned and collated, a final report will be prepared for presentation to the Steering Group.

**ACTION:** Robert Olson and Associates

## Discussion of FY 2000 Plans

Because of financial adjustments in years 2 and 3 of the program and the dates funds are received and actually used, it was decided that a self-evaluation of the program should not be done until the end of year 5. It was also suggested that due to the group's extended knowledge, the Implementation Plan should be amended to use a 2-year time horizon vs. a 1-year time horizon. E. Bernard will contact each Steering Group member to better assess where we are as a group financially (spending patterns) and determine our actions over the next 6 months. He will present the status and bring ideas for the future to the October Steering Group meeting.

**ACTION:** Bernard

## Future Initiatives beyond FY 2000

*Establishment of a broad band seismological network for WC/ATWC and PTWC -- Hagemeyer --* Mr. Hagemeyer put forward this initiative to add backup redundancy to the routes for data reception for the two tsunami warning centers. Initially this backup system would work between the two warning centers and be the first step in a Pan-Pacific network. Mr. Hagemeyer requested \$70K from the seismic budget for two stations. He said recurring costs would be handled from the NWS budget. After much discussion, it was requested that Mr. Hagemeyer

consult with satellite experts on the his PSAT data transmission needs to be sure there is sufficient capacity. He will bring the results of his inquiries to the October meeting for discussion. Funds were approved for later years. **ACTION:** Hagemeyer

*New Data Initiative-- Kamphaus* --Lt Kamphaus presented an initiative to promote the generation of high quality digital bathymetry and topography data for future inundation studies. There is a definitive need for more and better available data (digital) in order to produce models and inundation maps. He requested \$50K for the first year (FY 2000) to participate in cooperative efforts with other agencies; \$25K to the National Geological Data Center to support prioritized digitization of data for Alaska and \$25K for additional projects and to attract matching funds. Some possible additional projects could be to expand the ALACE flight paths, do add-on multibeam surveys, or digitize county topographical maps. There are no funds left for this fiscal year but we might try one project as there is no manpower for more. Lt Kamphaus will contact NGDC to see if digitizing priorities can be rearranged to move Alaska forward. **ACTION:** Lt Kamphaus

## Other Business

Each member of the Hazard Mitigation Subcommittee was tasked to provide a distribution list of interested state and local government officials for distribution of the TsuInfo Alert Newsletter. **ACTION:** Hazard Mitigation Subcommittee Members

Copies of any letters of support generated by states for the FY 2000 budget need to be faxed to E. Bernard by next week. **ACTION:** All

E. Bernard suggested that he would submit the Steering Group for a Western States Seismic Policy Council award. **ACTION:** Bernard

On behalf of the Steering Group, L. Dengler extended her thanks to Jim Hulsebus, Program Manager for the Humboldt State Emergency Operations Center (EOC), for supporting us by allowing us to meet in the newly dedicated EOC. He was presented with a National Tsunami Hazard Mitigation mug.

## Next Meeting Date and Location

October 4-8, in Newport, Oregon.

**May 30 Field Trip to Crescent City to examine paleotsunami deposits.**

Stops include: (1) Redwood Park Information Center, Orick. The current Information Center sits at the mouth of Redwood Creek. Carver has mapped tsunami deposits at the site of the Yurok village of Orick. There is a wealth of oral history connected to this site. Tserkr told a story to Kroeber in the late 1800s about an earthquake and "flood" which inundated a house site mapped at 70 feet above the current sea level. Two other oral history sources give similar water marks on the opposite side of the valley. This is arguably the best site anywhere in Cascadia which ties native stories to a specific paleotsunami deposits. The area is also the part of a current controversy about camping on the Freshwater spit and the location of the Information Center. (2) Lagoon Creek, near "Trees of Mystery." This is a mile-long fresh water pond extensively studied by two of Gary's graduate students. Twenty-seven vibracores were recovered from the lagoon and detailed sedimentology and diatom studies conducted. It is an amazing story. The lagoon was not flooded by the 1964 tsunami but has been repeatedly breached in the past 2500 years. (3) Crescent Beach Motel marsh. A series of fresh water marshes occupy both the west and east sides of Highway 101. The westernmost ponds were inundated both in 1960 and 1964. Gary poked a number of cores extending inland nearly 1 km. from the coast. The historic tsunami deposits are thin and die out very quickly east of the highway. Two paleotsunami deposits are preserved--the earlier event (1100 ybp?) is so robust that it apparently obliterated the stratigraphy beneath it. (4) Downtown Crescent City. The group walked the inundation zone of 1964 and talked to survivors and emergency management officials. The first evacuation route signs in California went up about a month ago!