

**National Tsunami Hazard Mitigation Program Meeting
November, 2-4, 2004
Oakland, California**

Attendees:

Jeff LaDouce – NOAA/NWS (Chair)	Michael Reichle – CA Geological Survey
Sterling Yong – HI DLNR	James Goltz – CA – OES
Brian Yanagi – HI State Civil Defense	Don Hoirup, Jr. – CA Geological Survey
David Oppenheimer – USGS	Richard Eisner - CA - OES
Laura Kong – NOAA/ITIC	Kathleen O'Neil – NOAA/NDBC
Jeff Lorens – NOAA/NWS WR	Melinda Bailey – NOAA/NWS SR
Michael Hornick – FEMA/DHS	Roger Hansen – Univ. of Alaska
Ervin Petty – Div. of HS&EM, AK	R. Scott Simmons – Div. of HS&EM, AK
Vasily Titov – NOAA/PMEL	Craig Weaver – USGS
Charles McCreery – PTWC	Paul Whitmore - WC/ATWC
Tim Walsh – WA – DNR	George Crawford – WA – EMD
Leslie Chapman-Henderson – FLASH	Jay Wilson – OR – EMD
George Priest – OR/DOGAMI	Eddie Bernard – NOAA/PMEL
Frank Gonzalez – NOAA/PMEL	Harry Yeh – OR State Univ.
Michael Mahoney – FEMA/DHS	Jan Jones – NOAA/NWS – Recorder
Chris Jonientz-Trisler – FEMA/DHS	

Review of Action Items

Action Item 1: The USGS earthquake response plan and the NOAA response plan need to be examined to be sure that tsunami is included in both plans.

Status: Completed and continuing.

Action Item 2: Take the 14 program goals and formulate a new 5-year plan.

Status: Continuing – no action this period. Next 5-year review to be conducted in Summer 2006.

Action Item 3: Form a Technical Advisory Board.

Status: Completed.

Action Item 4: Provide names of presenters for future meetings, e.g., social scientists, local emergency managers and WCM's, national and local media, and researchers.

Status: Continuing and to be taken off action items list.

Leslie Chapman-Henderson, President and CEO of the Federal Alliance for Safe Homes (FLASH), gave a presentation of FLASH card handouts that she provides to schools, businesses, etc. on how to prepare before, during and after a natural disaster.

Action Item 5: The group was asked for comments on the NDBC Draft DART Concept of Operation Document.

Action: Kathleen O'Neil: Equator Buoy Information and redraft of operations plan – revised with final comments.

Status: Completed.

Action Item 6: Explore issues and challenges of developing a concept called “Bridge for Disseminating Real Time Technical Assistance and Coordinating Community Protection.”

Status: Continuing

Action Item 7: The group was asked to provide, in writing, the Latitude and Longitude locations for the 7th and 8th DART buoys for NDBC.

Status: OPEN

Action: Charles McCreery and Jeff LaDouce by end of November, beginning of December.

Action Item 8: CREW – Cascadia Region States

Action: This item has been removed as it is considered an emergency management issue and will be coordinated at the regional level.

Action Item 9 Establish a Working Group driven by Emergency Management needs.

Status: The NTHMP Modeling and Mapping Working Group has been established. Completed.

Action Item 10: 5-Year Plan

Status: Completed.

New Action Item: Rich Eisner to provide FEMA strategic plan. Eddie Bernard suggested getting an original plan for FY05 and have it be “evolutionary” with changes in formats, but not the plan.

New Action Item: Tsunami Awareness Week 2006

Sen. Inouye and Jeff LaDouce are to draft a proclamation to introduce Tsunami Awareness Week during Earthquake Awareness Month in April. This will coincide with the 60th Anniversary of the 1946 tsunami that struck Hawaii and the 100th Anniversary of the 1906 event.

Leslie Chapman Henderson from the Federal Alliance for Safe Homes (FLASH)

Leslie gave a presentation with what FLASH has available to the public for disasters. The safety information packets are available at Home Depot & State Farm Insurance to name just two. The FLASH website had 2 ½ million hits during September alone. (www.flash.org)

There will be a large FLASH meeting in Sarasota Florida, February 8-10, 2005. There is also a PBS special, Tsunami's and Earthquakes that will be shown on national television.

Harry Yeh – Oregon State University

Harry gave a presentation showing a Tsunami Shelter in Nishiki Japan. With the reinforced concrete, masonry and wood frame it was a compilation of previous work completed, and resembled a lighthouse shape.

Melinda Bailey – Marine & Public Meteorologist - Texas

To follow is the information on tide gage locations (which ones need to be upgraded to include real time observations and locations of new ones) in the Puerto Rico area. Here is what we found out:

New Ones:

Mona Island, Facilities of the Park Rangers of the PR Dept. of Natural Resources (67.94 W and 18.08 N).

Aguadilla, Pier, (67.17 W, 18.46 W)

Culebra, Pier of Ports Authority (65.30 W, 18.30 N).

Vieques, Esperanza, (65.47W, 18.09 N).

(All these locations would be subject to the approval of the operators of the facilities).

NOAA has tide gages at the following localities, these all make 6-minute observations:

Magueyes, Parguera, 17.97N, 67.05W

Guayanilla (66.16 W, 17.98 N)

La Puntilla (San Juan Bay), 18.45N, 66.12 W

Lime Tree Bay, St. Croix, 17.70N, 64.75W

Charlotte Amalie, St. Thomas, 18.34N, 64.92W

Paul Whitmore – West Coast/Alaska Tsunami Warning Center

BC Tide Gage Equipment:

The GOES transmitter equipment funded by the NTHMP with FY2003 funds has been procured and received at the WC/ATWC. We are now drafting a Memorandum of Agreement (MOA) between the NWS and the Canadian Hydrographic Survey (CHS). The CHS is also drafting a Partnership Agreement concerning this project. When the MOA is signed is signed by both parties, WC/ATWC will send all equipment to CHS for installation in the summer of 2005.

To follow-up on Thursday's session, attached are three example WC/ATWC tsunami warning messages which contain Evaluations Sections stating:

WarningMessage1.txt - no major inundation expected but potential significant impact near shore,

WarningMessage2.txt - major inundation possible, and

WarningMessageU.txt - inundation level can not be estimated.

Instead of breaking warnings down into different levels as was proposed at the May meeting, these samples continue the present warning/watch/info only structure of tsunami warnings. The only changes proposed are in the evaluation section (the wording was determined by a team appointed at the March TCM meeting). These three samples would be issued after a tsunami has been recorded and the tsunami warning centers have had a chance to determine the impact potential of an event.

Please let me know within the next two weeks if you see any problems in using these Evaluations as opposed to the present message format which provides no information on the potential impact. Keep in mind these are NWS products and must follow a fairly rigorous structure (which is why everything is in capital letters and certain punctuation cannot be used).

WEPA41 PAAQ 292137
TSUWCA

TO - TSUNAMI WARNING SYSTEM PARTICIPANTS IN
ALASKA/BRITISH COLUMBIA/WASHINGTON/OREGON/CALIFORNIA
FROM - WEST COAST AND ALASKA TSUNAMI WARNING CENTER/NOAA/NWS
SUBJECT - TSUNAMI WARNING BULLETIN - SUPPLEMENT
BULLETIN NUMBER 3
ISSUED 10/29/2004 AT 2137 UTC

This is a SAMPLE Tsunami Warning Message

...A TSUNAMI WARNING IS IN EFFECT FOR THE PACIFIC COASTAL AREAS
OF ALASKA - BRITISH COLUMBIA - WASHINGTON - OREGON AND
CALIFORNIA...

EARTHQUAKE DATA
PRELIMINARY MAGNITUDE - 8.0
LOCATION - 53.0N 165.5W - 75 MILES SE OF DUTCH HARBOR-AK.
480 MILES E OF ADAK-AK.
TIME - 1230 ADT 10/29/2004
1330 PDT 10/29/2004
2030 UTC 10/29/2004

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE TO THE
PACIFIC COAST. WAVE HEIGHTS OF THIS TSUNAMI EVENT CAN NOT BE
PREDICTED. THEREFORE PERSONS IN LOW LYING COASTAL AREAS
SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL OFFICIALS.
PERSONS ON THE BEACH SHOULD MOVE TO HIGHER GROUND IF IN A
TSUNAMI HAZARD ZONE.

WHEN NO MAJOR WAVES HAVE BEEN OBSERVED FOR TWO HOURS AFTER
THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED
FOR AT LEAST TWO HOURS LOCAL AUTHORITIES SHOULD ASSUME THAT THE
TSUNAMI THREAT IS OVER. AS LOCAL CONDITIONS CAN CAUSE A WIDE
VARIATION IN TSUNAMI ACTIVITY THE ALL CLEAR DETERMINATIONS
MUST BE MADE BY LOCAL AUTHORITIES.

OBSERVED TSUNAMI HEIGHTS
DUTCH HARBOR 750CM/24.6FT.

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PKZ176-175-172-170-171-155-150-132-136-138-137-130-141-140-
120-121-129-127-125-126-128-052-051-053-022-012-043-013-
011-021-032-031-042-034-033-035-041-036-PZZ130-131-133-134-
132-135-150-153-156-110-250-210-255-350-353-356-450-455-
550-530-535-555-670-673-650-655-750-AKZ191-185-181-171-145-
111-101-121-125-131-135-017-020-018-019-021-022-023-024-
025-026-028-029-027-WAZ001-002-005-006-007-008-009-010-011-
013-014-015-016-021-ORZ001-002-021-022-CAZ001-002-005-007-
006-075-074-009-034-035-039-040-046-041-042-043-292237-
COASTAL AREAS FROM THE CALIFORNIA-MEXICO BORDER TO ATTU-AK.
INCLUSIVE.

...A TSUNAMI WARNING IS IN EFFECT FOR THE COASTAL AREAS
FROM THE CALIFORNIA-MEXICO BORDER TO ATTU-AK. INCLUSIVE...

ESTIMATED TIMES OF INITIAL WAVE ARRIVAL

DUTCH HARBOR-AK 1330 ADT OCT 29 HOMER-AK 1611 ADT OCT 29
ADAK-AK 1357 ADT OCT 29 KETCHIKAN-AK 1648 ADT OCT 29
SAND PT.-AK 1400 ADT OCT 29 JUNEAU-AK 1650 ADT OCT 29
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SHEMYA-AK 1438 ADT OCT 29 NEAH BAY-WA 1813 PDT OCT 29
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YAKUTAT-AK 1528 ADT OCT 29 SEASIDE-OR 1825 PDT OCT 29
SITKA-AK 1529 ADT OCT 29 ASTORIA-OR 1849 PDT OCT 29
LANGARA-BC 1636 PDT OCT 29 SAN FRANCISCO-CA 1913 PDT OCT 29
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CORDOVA-AK 1547 ADT OCT 29 LA JOLLA-CA 1950 PDT OCT 29
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THE PACIFIC TSUNAMI WARNING CENTER AT EWA BEACH HAWAII WILL
ISSUE BULLETINS FOR OTHER AREAS OF THE PACIFIC.

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT.
THE TSUNAMI WARNING WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.
REFER TO THE INTERNET SITE [HTTP://WCATWC.ARH.NOAA.GOV](http://WCATWC.ARH.NOAA.GOV)
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EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE TO THE PACIFIC COAST. THEREFORE PERSONS IN LOW LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL OFFICIALS. PERSONS AT OR NEAR THE BEACH SHOULD MOVE TO HIGHER GROUND IF IN A WARNED AREA.

EXPECTED WAVE HEIGHTS ARE SUCH THAT DANGER IS LIMITED TO THOSE IN OR NEAR THE WATERFRONT. AN EXTREME INUNDATION IS NOT EXPECTED. ASSOCIATED CURRENTS CAN BE HAZARDOUS TO BOATS AND COASTAL STRUCTURES.

WHEN NO MAJOR WAVES HAVE BEEN OBSERVED FOR TWO HOURS AFTER THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS LOCAL AUTHORITIES SHOULD ASSUME THAT THE TSUNAMI THREAT IS OVER. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI ACTIVITY THE ALL CLEAR DETERMINATIONS MUST BE MADE BY LOCAL AUTHORITIES.

OBSERVED TSUNAMI HEIGHTS
DUTCH HARBOR 750CM/24.6FT.

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...A TSUNAMI WARNING IS IN EFFECT FOR THE COASTAL AREAS FROM THE CALIFORNIA-MEXICO BORDER TO ATTU-AK. INCLUSIVE...

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IN A TSUNAMI HAZARD ZONE.

A SIGNIFICANT INUNDATION IS EXPECTED AT SOME LOCALITIES
THROUGHOUT THE WARNED AREA. INUNDATION LEVELS MAY VARY GREATLY
ALONG THE COAST AND CAN NOT BE PREDICTED.

WHEN NO MAJOR WAVES HAVE BEEN OBSERVED FOR TWO HOURS AFTER
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550-530-535-555-670-673-650-655-750-AKZ191-185-181-171-145-
111-101-121-125-131-135-017-020-018-019-021-022-023-024-
025-026-028-029-027-WAZ001-002-005-006-007-008-009-010-011-
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Frank González – Completion of Action Item: Mapping and Modeling Working Group

Frank González, Director, TIME Center, distributed and presented overviews of the “TIME Center Report: FY2004 Progress and FY2005 Plans” and the “Tsunami Forecasting System: FY2004 Progress and FY2005 Plans” report.

Dr. González also reported on the first meeting of the NTHMP Modeling and Mapping Subcommittee (MMS), held on November 2, 2004. Four recommendations were developed at that meeting that address the establishment of Standards and Procedures for identification of NTHMP-

approved tsunami models. Dr. González presented these four recommendations for approval and adoption by the NTHMP Steering Group. After some discussion, Recommendation 2 was modified -- the original phrase "Peer-reviewed Journal Articles" was replaced by the phrase "Peer-reviewed Publications." The Steering Group then approved and adopted the modified MMS Recommendations, worded as follows, with clarifying phrases added in brackets.

Recommendations Approved and Adopted by the NTHMP Steering Group:

1. That Standards and Procedures be developed for NTHMP Tsunami Model Approval.
2. That the basis for Tsunami Model Approval Standards and Procedures be Peer-reviewed Publications [that document issues such as]
 - Methodology (Hydrodynamics, Numerical Scheme, etc.)
 - Benchmark tests (Analytic, Laboratory, Field obs, etc.)
 - Case Studies (Okushiri, Nicaragua, Flores, PNG, etc.)
3. That the MMS, in consultation with community experts, develop Guidelines on Standards and Procedures [including, for example]
 - Standards: Content of documentation; metrics ...
 - Procedures: Database of case studies; approval ...
4. That NTHMP funding be provided for travel expenses of experts assisting the MMS

Discussions at the May 18, 2004 NTHMP Steering Group meeting in Anchorage resulted in an Action Item to establish a working group driven by Emergency Management need, that will develop recommendations on technical and policy issues related to NTHMP mapping and modeling efforts.

In accordance with this Action Item, the NTHMP Modeling and Mapping Working Group (MMWG) is now established.

E-mail and telephone discussions with the State members of the Steering Group have produced unanimous agreement on the following:

1. (MMWG) Statement of Purpose

"The responsibility of the NTHMP Modeling and Mapping Working Group is to develop scientific, technical and policy recommendations for the NTHMP Steering Group that are based on the best available science."

2. MMWG Organizational Structure:

- current State Emergency Management official on the Steering Group,
- current State Geotechnical official on the Steering Group,
- current Director of the TIME Center

Consequently, the corresponding, current MMWG membership is:

Alaska:	Scott Simmons and Roger Hansen
California:	Richard Eisner and Mike Reichle
Hawaii:	Brian Yanagi and Sterling Yong
Oregon:	George Priest and Jay Wilson
Washington:	George Crawford and Tim Walsh
TIME Center:	Frank González

Our immediate task is to develop a prioritized list of issues. There are many such issues, including: model certification, data acquisition, standards and quality control, probabilistic methodologies, etc.

We will collate, organize and refine suggested issues to produce a prioritized list that we can begin to address in a systematic manner.

Kathleen O'Neil NDBC DART Status

NOAA National Data Buoy Center operates and maintains the 6-station Deep-Ocean Assessment and Reporting of Tsunamis (DART) network. The presentation made at the November 2004 NTHMP meeting included operational status of the network, FY04 challenges and successes, and FY05 plans.

Aurelio Mercado – University of Puerto Rico

Professor Mercado gave a presentation that included tsunami flood maps with hurricanes rated 1-5, indicated with tsunami storm surge. He said these are useful for education and outreach workshops in schools including having a drill. He also said he has tsunami hazard sign visibility, a website, and Spanish tsunami video.

The next NTHMP Steering Group meeting will be held at the National Weather Service Western Regional Headquarters, Pacific Guardian Center, Honolulu, Hawaii, June 7-9, 2005.

A tour of the Pacific Tsunami Warning Center will also take place.

Hotel information will be provided approximately 6 weeks prior to the meeting.

Meeting contact is Jan Jones NOAA/NWS (jan.jones@noaa.gov).

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Action: This item has been removed as it is considered an emergency management issue and will be coordinated at the regional level.

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There will be a large FLASH meeting in Sarasota Florida, February 8-10, 2005. There is also a PBS special, Tsunami's and Earthquakes that will be shown on national television.

Harry Yeh – Oregon State University

Harry gave a presentation showing a Tsunami Shelter in Nishiki Japan. With the reinforced concrete, masonry and wood frame it was a compilation of previous work completed, and resembled a lighthouse shape.

Melinda Bailey – Marine & Public Meteorologist - Texas

To follow is the information on tide gage locations (which ones need to be upgraded to include real time observations and locations of new ones) in the Puerto Rico area. Here is what we found out:

New Ones:

Mona Island, Facilities of the Park Rangers of the PR Dept. of Natural Resources (67.94 W and 18.08 N).

Aguadilla, Pier, (67.17 W, 18.46 W)

Culebra, Pier of Ports Authority (65.30 W, 18.30 N).

Vieques, Esperanza, (65.47W, 18.09 N).

(All these locations would be subject to the approval of the operators of the facilities).

NOAA has tide gages at the following localities, these all make 6-minute observations:

Magueyes, Parguera, 17.97N, 67.05W

Guayanilla (66.16 W, 17.98 N)

La Puntilla (San Juan Bay), 18.45N, 66.12 W

Lime Tree Bay, St. Croix, 17.70N, 64.75W

Charlotte Amalie, St. Thomas, 18.34N, 64.92W

Paul Whitmore – West Coast/Alaska Tsunami Warning Center

BC Tide Gage Equipment:

The GOES transmitter equipment funded by the NTHMP with FY2003 funds has been procured and received at the WC/ATWC. We are now drafting a Memorandum of Agreement (MOA) between the NWS and the Canadian Hydrographic Survey (CHS). The CHS is also drafting a Partnership Agreement concerning this project. When the MOA is signed is signed by both parties, WC/ATWC will send all equipment to CHS for installation in the summer of 2005.

To follow-up on Thursday's session, attached are three example WC/ATWC tsunami warning messages which contain Evaluations Sections stating:

WarningMessage1.txt - no major inundation expected but potential significant impact near shore,

WarningMessage2.txt - major inundation possible, and

WarningMessageU.txt - inundation level can not be estimated.

Instead of breaking warnings down into different levels as was proposed at the May meeting, these samples continue the present warning/watch/info only structure of tsunami warnings. The only changes proposed are in the evaluation section (the wording was determined by a team appointed at the March TCM meeting). These three samples would be issued after a tsunami has been recorded and the tsunami warning centers have had a chance to determine the impact potential of an event.

Please let me know within the next two weeks if you see any problems in using these Evaluations as opposed to the present message format which provides no information on the potential impact. Keep in mind these are NWS products and must follow a fairly rigorous structure (which is why everything is in capital letters and certain punctuation cannot be used).

WEPA41 PAAQ 292137
TSUWCA

TO - TSUNAMI WARNING SYSTEM PARTICIPANTS IN
ALASKA/BRITISH COLUMBIA/WASHINGTON/OREGON/CALIFORNIA
FROM - WEST COAST AND ALASKA TSUNAMI WARNING CENTER/NOAA/NWS
SUBJECT - TSUNAMI WARNING BULLETIN - SUPPLEMENT
BULLETIN NUMBER 3
ISSUED 10/29/2004 AT 2137 UTC

This is a SAMPLE Tsunami Warning Message

...A TSUNAMI WARNING IS IN EFFECT FOR THE PACIFIC COASTAL AREAS
OF ALASKA - BRITISH COLUMBIA - WASHINGTON - OREGON AND
CALIFORNIA...

EARTHQUAKE DATA
PRELIMINARY MAGNITUDE - 8.0
LOCATION - 53.0N 165.5W - 75 MILES SE OF DUTCH HARBOR-AK.
480 MILES E OF ADAK-AK.
TIME - 1230 ADT 10/29/2004
1330 PDT 10/29/2004
2030 UTC 10/29/2004

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE TO THE
PACIFIC COAST. WAVE HEIGHTS OF THIS TSUNAMI EVENT CAN NOT BE
PREDICTED. THEREFORE PERSONS IN LOW LYING COASTAL AREAS
SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL OFFICIALS.
PERSONS ON THE BEACH SHOULD MOVE TO HIGHER GROUND IF IN A
TSUNAMI HAZARD ZONE.

WHEN NO MAJOR WAVES HAVE BEEN OBSERVED FOR TWO HOURS AFTER
THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED
FOR AT LEAST TWO HOURS LOCAL AUTHORITIES SHOULD ASSUME THAT THE
TSUNAMI THREAT IS OVER. AS LOCAL CONDITIONS CAN CAUSE A WIDE
VARIATION IN TSUNAMI ACTIVITY THE ALL CLEAR DETERMINATIONS
MUST BE MADE BY LOCAL AUTHORITIES.

OBSERVED TSUNAMI HEIGHTS
DUTCH HARBOR 750CM/24.6FT.

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PKZ176-175-172-170-171-155-150-132-136-138-137-130-141-140-
120-121-129-127-125-126-128-052-051-053-022-012-043-013-
011-021-032-031-042-034-033-035-041-036-PZZ130-131-133-134-
132-135-150-153-156-110-250-210-255-350-353-356-450-455-
550-530-535-555-670-673-650-655-750-AKZ191-185-181-171-145-
111-101-121-125-131-135-017-020-018-019-021-022-023-024-
025-026-028-029-027-WAZ001-002-005-006-007-008-009-010-011-
013-014-015-016-021-ORZ001-002-021-022-CAZ001-002-005-007-
006-075-074-009-034-035-039-040-046-041-042-043-292237-
COASTAL AREAS FROM THE CALIFORNIA-MEXICO BORDER TO ATTU-AK.
INCLUSIVE.

...A TSUNAMI WARNING IS IN EFFECT FOR THE COASTAL AREAS
FROM THE CALIFORNIA-MEXICO BORDER TO ATTU-AK. INCLUSIVE...

ESTIMATED TIMES OF INITIAL WAVE ARRIVAL

DUTCH HARBOR-AK 1330 ADT OCT 29 HOMER-AK 1611 ADT OCT 29
ADAK-AK 1357 ADT OCT 29 KETCHIKAN-AK 1648 ADT OCT 29
SAND PT.-AK 1400 ADT OCT 29 JUNEAU-AK 1650 ADT OCT 29
COLD BAY-AK 1427 ADT OCT 29 TOFINO-BC 1803 PDT OCT 29
SHEMYA-AK 1438 ADT OCT 29 NEAH BAY-WA 1813 PDT OCT 29
KODIAK-AK 1448 ADT OCT 29 CHARLESTON-OR 1817 PDT OCT 29
SEWARD-AK 1515 ADT OCT 29 CRESCENT CITY-CA 1824 PDT OCT 29
YAKUTAT-AK 1528 ADT OCT 29 SEASIDE-OR 1825 PDT OCT 29
SITKA-AK 1529 ADT OCT 29 ASTORIA-OR 1849 PDT OCT 29
LANGARA-BC 1636 PDT OCT 29 SAN FRANCISCO-CA 1913 PDT OCT 29
VALDEZ-AK 1538 ADT OCT 29 SAN PEDRO-CA 1940 PDT OCT 29
CORDOVA-AK 1547 ADT OCT 29 LA JOLLA-CA 1950 PDT OCT 29
\$\$

THE PACIFIC TSUNAMI WARNING CENTER AT EWA BEACH HAWAII WILL
ISSUE BULLETINS FOR OTHER AREAS OF THE PACIFIC.

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT.
THE TSUNAMI WARNING WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.
REFER TO THE INTERNET SITE [HTTP://WCATWC.ARH.NOAA.GOV](http://WCATWC.ARH.NOAA.GOV)
FOR MORE INFORMATION AND ETA SITES.

WEPA41 PAAQ 292137
TSUWCA

TO - TSUNAMI WARNING SYSTEM PARTICIPANTS IN
ALASKA/BRITISH COLUMBIA/WASHINGTON/OREGON/CALIFORNIA
FROM - WEST COAST AND ALASKA TSUNAMI WARNING CENTER/NOAA/NWS
SUBJECT - TSUNAMI WARNING BULLETIN - SUPPLEMENT
BULLETIN NUMBER 3
ISSUED 10/29/2004 AT 2137 UTC

This is a SAMPLE Tsunami Warning Message

...A TSUNAMI WARNING IS IN EFFECT FOR THE PACIFIC COASTAL AREAS
OF ALASKA - BRITISH COLUMBIA - WASHINGTON - OREGON AND
CALIFORNIA...

EARTHQUAKE DATA

PRELIMINARY MAGNITUDE - 8.0
LOCATION - 53.0N 165.5W - 75 MILES SE OF DUTCH HARBOR-AK.
480 MILES E OF ADAK-AK.
TIME - 1230 ADT 10/29/2004
1330 PDT 10/29/2004
2030 UTC 10/29/2004

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE TO THE PACIFIC COAST. THEREFORE PERSONS IN LOW LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL OFFICIALS. PERSONS AT OR NEAR THE BEACH SHOULD MOVE TO HIGHER GROUND IF IN A WARNED AREA.

EXPECTED WAVE HEIGHTS ARE SUCH THAT DANGER IS LIMITED TO THOSE IN OR NEAR THE WATERFRONT. AN EXTREME INUNDATION IS NOT EXPECTED. ASSOCIATED CURRENTS CAN BE HAZARDOUS TO BOATS AND COASTAL STRUCTURES.

WHEN NO MAJOR WAVES HAVE BEEN OBSERVED FOR TWO HOURS AFTER THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS LOCAL AUTHORITIES SHOULD ASSUME THAT THE TSUNAMI THREAT IS OVER. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI ACTIVITY THE ALL CLEAR DETERMINATIONS MUST BE MADE BY LOCAL AUTHORITIES.

OBSERVED TSUNAMI HEIGHTS
DUTCH HARBOR 750CM/24.6FT.

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PKZ176-175-172-170-171-155-150-132-136-138-137-130-141-140-120-121-129-127-125-126-128-052-051-053-022-012-043-013-011-021-032-031-042-034-033-035-041-036-PZZ130-131-133-134-132-135-150-153-156-110-250-210-255-350-353-356-450-455-550-530-535-555-670-673-650-655-750-AKZ191-185-181-171-145-111-101-121-125-131-135-017-020-018-019-021-022-023-024-025-026-028-029-027-WAZ001-002-005-006-007-008-009-010-011-013-014-015-016-021-ORZ001-002-021-022-CAZ001-002-005-007-006-075-074-009-034-035-039-040-046-041-042-043-292237-COASTAL AREAS FROM THE CALIFORNIA-MEXICO BORDER TO ATTU-AK. INCLUSIVE.

...A TSUNAMI WARNING IS IN EFFECT FOR THE COASTAL AREAS FROM THE CALIFORNIA-MEXICO BORDER TO ATTU-AK. INCLUSIVE...

ESTIMATED TIMES OF INITIAL WAVE ARRIVAL

DUTCH HARBOR-AK 1330 ADT OCT 29 HOMER-AK 1611 ADT OCT 29
ADAK-AK 1357 ADT OCT 29 KETCHIKAN-AK 1648 ADT OCT 29
SAND PT.-AK 1400 ADT OCT 29 JUNEAU-AK 1650 ADT OCT 29
COLD BAY-AK 1427 ADT OCT 29 TOFINO-BC 1803 PDT OCT 29
SHEMYA-AK 1438 ADT OCT 29 NEAH BAY-WA 1813 PDT OCT 29
KODIAK-AK 1448 ADT OCT 29 CHARLESTON-OR 1817 PDT OCT 29
SEWARD-AK 1515 ADT OCT 29 CRESCENT CITY-CA 1824 PDT OCT 29
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VALDEZ-AK 1538 ADT OCT 29 SAN PEDRO-CA 1940 PDT OCT 29
CORDOVA-AK 1547 ADT OCT 29 LA JOLLA-CA 1950 PDT OCT 29

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THE PACIFIC TSUNAMI WARNING CENTER AT EWA BEACH HAWAII WILL

ISSUE BULLETINS FOR OTHER AREAS OF THE PACIFIC.

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT.
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FOR MORE INFORMATION AND ETA SITES.

WEPA41 PAAQ 292137
TSUWCA

TO - TSUNAMI WARNING SYSTEM PARTICIPANTS IN
ALASKA/BRITISH COLUMBIA/WASHINGTON/OREGON/CALIFORNIA
FROM - WEST COAST AND ALASKA TSUNAMI WARNING CENTER/NOAA/NWS
SUBJECT - TSUNAMI WARNING BULLETIN - SUPPLEMENT
BULLETIN NUMBER 2
ISSUED 10/29/2004 AT 2137 UTC

This is a SAMPLE Tsunami Warning Message

...A TSUNAMI WARNING IS IN EFFECT FOR THE PACIFIC COASTAL AREAS
OF ALASKA - BRITISH COLUMBIA - WASHINGTON - OREGON AND
CALIFORNIA...

EARTHQUAKE DATA
PRELIMINARY MAGNITUDE - 8.0
LOCATION - 53.0N 165.5W - 75 MILES SE OF DUTCH HARBOR-AK.
480 MILES E OF ADAK-AK.
TIME - 1230 ADT 10/29/2004
1330 PDT 10/29/2004
2030 UTC 10/29/2004

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE TO THE
PACIFIC COAST. THEREFORE PERSONS IN LOW LYING COASTAL AREAS
SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL OFFICIALS.
PERSONS AT OR NEAR THE BEACH SHOULD MOVE TO HIGHER GROUND IF
IN A TSUNAMI HAZARD ZONE.

A SIGNIFICANT INUNDATION IS EXPECTED AT SOME LOCALITIES
THROUGHOUT THE WARNED AREA. INUNDATION LEVELS MAY VARY GREATLY
ALONG THE COAST AND CAN NOT BE PREDICTED.

WHEN NO MAJOR WAVES HAVE BEEN OBSERVED FOR TWO HOURS AFTER
THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED
FOR AT LEAST TWO HOURS LOCAL AUTHORITIES SHOULD ASSUME THAT THE
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OBSERVED TSUNAMI HEIGHTS
DUTCH HARBOR 750CM/24.6FT.

\$\$

PKZ176-175-172-170-171-155-150-132-136-138-137-130-141-140-
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011-021-032-031-042-034-033-035-041-036-PZZ130-131-133-134-
132-135-150-153-156-110-250-210-255-350-353-356-450-455-
550-530-535-555-670-673-650-655-750-AKZ191-185-181-171-145-
111-101-121-125-131-135-017-020-018-019-021-022-023-024-
025-026-028-029-027-WAZ001-002-005-006-007-008-009-010-011-
013-014-015-016-021-ORZ001-002-021-022-CAZ001-002-005-007-
006-075-074-009-034-035-039-040-046-041-042-043-292237-
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FROM THE CALIFORNIA-MEXICO BORDER TO ATTU-AK. INCLUSIVE...

ESTIMATED TIMES OF INITIAL WAVE ARRIVAL

DUTCH HARBOR-AK	1330 ADT OCT 29	HOMER-AK	1611 ADT OCT 29
ADAK-AK	1357 ADT OCT 29	KETCHIKAN-AK	1648 ADT OCT 29
SAND PT.-AK	1400 ADT OCT 29	JUNEAU-AK	1650 ADT OCT 29
COLD BAY-AK	1427 ADT OCT 29	TOFINO-BC	1803 PDT OCT 29
SHEMYA-AK	1438 ADT OCT 29	NEAH BAY-WA	1813 PDT OCT 29
KODIAK-AK	1448 ADT OCT 29	CHARLESTON-OR	1817 PDT OCT 29
SEWARD-AK	1515 ADT OCT 29	CRESCENT CITY-CA	1824 PDT OCT 29
YAKUTAT-AK	1528 ADT OCT 29	SEASIDE-OR	1825 PDT OCT 29
SITKA-AK	1529 ADT OCT 29	ASTORIA-OR	1849 PDT OCT 29
LANGARA-BC	1636 PDT OCT 29	SAN FRANCISCO-CA	1913 PDT OCT 29
VALDEZ-AK	1538 ADT OCT 29	SAN PEDRO-CA	1940 PDT OCT 29
CORDOVA-AK	1547 ADT OCT 29	LA JOLLA-CA	1950 PDT OCT 29

\$\$

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Frank González – Completion of Action Item: Mapping and Modeling Working Group

Frank González, Director, TIME Center, distributed and presented overviews of the “TIME Center Report: FY2004 Progress and FY2005 Plans” and the “Tsunami Forecasting System: FY2004 Progress and FY2005 Plans” report.

Dr. González also reported on the first meeting of the NTHMP Modeling and Mapping Subcommittee (MMS), held on November 2, 2004. Four recommendations were developed at that meeting that address the establishment of Standards and Procedures for identification of NTHMP-

approved tsunami models. Dr. González presented these four recommendations for approval and adoption by the NTHMP Steering Group. After some discussion, Recommendation 2 was modified -- the original phrase "Peer-reviewed Journal Articles" was replaced by the phrase "Peer-reviewed Publications." The Steering Group then approved and adopted the modified MMS Recommendations, worded as follows, with clarifying phrases added in brackets.

Recommendations Approved and Adopted by the NTHMP Steering Group:

1. That Standards and Procedures be developed for NTHMP Tsunami Model Approval
2. That the basis for Tsunami Model Approval Standards and Procedures be Peer-reviewed Publications [that document issues such as]
 - Methodology (Hydrodynamics, Numerical Scheme, etc.)
 - Benchmark tests (Analytic, Laboratory, Field obs, etc.)
 - Case Studies (Okushiri, Nicaragua, Flores, PNG, etc.)
3. That the MMS, in consultation with community experts, develop Guidelines on Standards and Procedures [including, for example]
 - Standards: Content of documentation; metrics ...
 - Procedures: Database of case studies; approval ...
4. That NTHMP funding be provided for travel expenses of experts assisting the MMS

Discussions at the May 18, 2004 NTHMP Steering Group meeting in Anchorage resulted in an Action Item to establish a working group driven by Emergency Management need, that will develop recommendations on technical and policy issues related to NTHMP mapping and modeling efforts.

In accordance with this Action Item, the NTHMP Modeling and Mapping Working Group (MMWG) is now established.

E-mail and telephone discussions with the State members of the Steering Group have produced unanimous agreement on the following:

1. (MMWG) Statement of Purpose

"The responsibility of the NTHMP Modeling and Mapping Working Group is to develop scientific, technical and policy recommendations for the NTHMP Steering Group that are based on the best available science."

2. MMWG Organizational Structure:

- current State Emergency Management official on the Steering Group,
- current State Geotechnical official on the Steering Group,
- current Director of the TIME Center

Consequently, the corresponding, current MMWG membership is:

Alaska:	Scott Simmons and Roger Hansen
California:	Richard Eisner and Mike Reichle
Hawaii:	Brian Yanagi and Sterling Yong
Oregon:	George Priest and Jay Wilson
Washington:	George Crawford and Tim Walsh
TIME Center:	Frank González

Our immediate task is to develop a prioritized list of issues. There are many such issues, including: model certification, data acquisition, standards and quality control, probabilistic methodologies, etc.

We will collate, organize and refine suggested issues to produce a prioritized list that we can begin to address in a systematic manner.

Kathleen O'Neil NDBC DART Status

NOAA National Data Buoy Center operates and maintains the 6-station Deep-Ocean Assessment and Reporting of Tsunamis (DART) network. The presentation made at the November 2004 NTHMP meeting included operational status of the network, FY04 challenges and successes, and FY05 plans.

Aurelio Mercado – University of Puerto Rico

Professor Mercado gave a presentation that included tsunami flood maps with hurricanes rated 1-5, indicated with tsunami storm surge. He said these are useful for education and outreach workshops in schools including having a drill. He also said he has tsunami hazard sign visibility, a website, and Spanish tsunami video.

The next NTHMP Steering Group meeting will be held at the National Weather Service Western Regional Headquarters, Pacific Guardian Center, Honolulu, Hawaii, June 7-9, 2005.

A tour of the Pacific Tsunami Warning Center will also take place. Hotel information will be provided approximately 6 weeks prior to the meeting. Meeting contact is Jan Jones NOAA/NWS (jan.jones@noaa.gov).