

Tsunami Newsletter



INTERNATIONAL TSUNAMI INFORMATION CENTER - ITIC

SUMMARY OF PACIFIC BASIN EARTHQUAKES

Occurring June-August 2001

*With surface wave or moment magnitudes greater than or equal to 6.5,
with a depth no greater than 100 km, or an event for which a TIB or RWW was issued.
(Ms and Mw based on NEIC records from USGS or Harvard)*

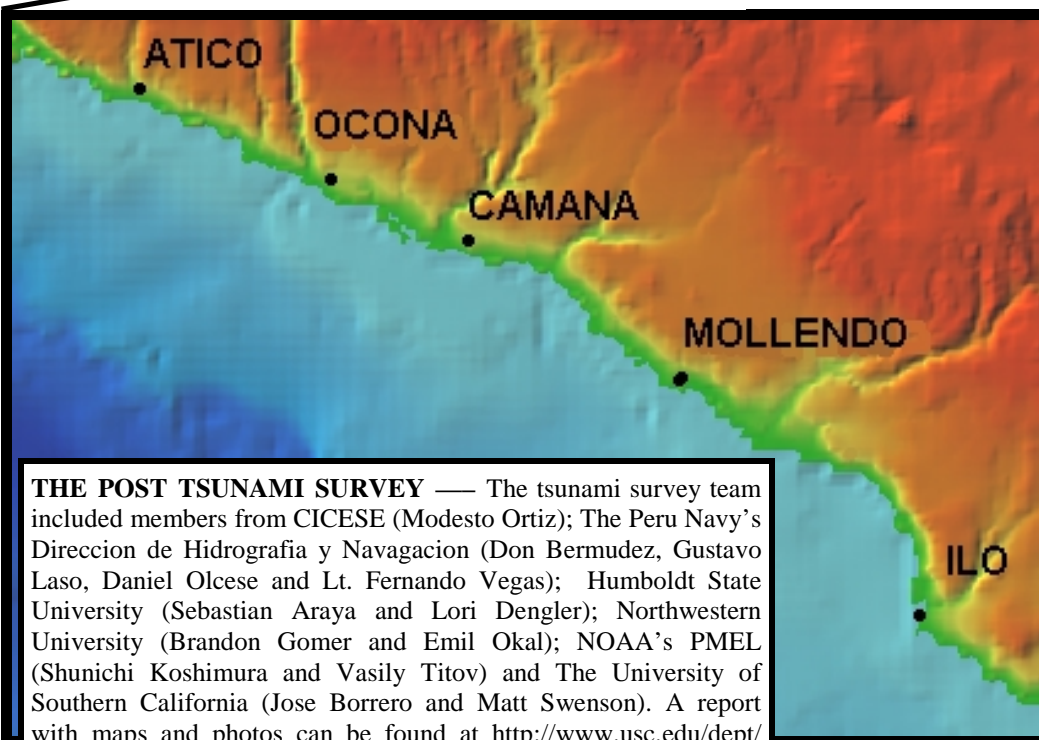
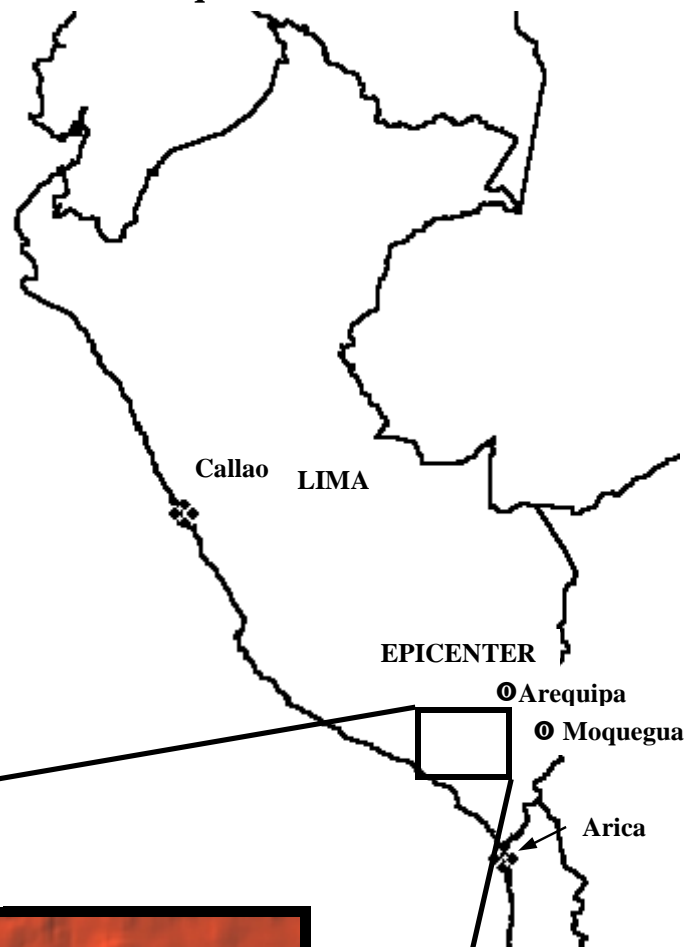
DATE	LOCATION	TIME (UTC)	LAT.	LONG.	DEPTH (km)	Ms	Mw	PTWC ACTION	ACTION (UTC)	Tsunami
June 14	Andreanof Island, Aleutian Island	19:49	51.2 N	179.8 W	18	6.3	6.5	—		No
June 23	Near the coast of Peru	20:33	16.1 S	73.3 W	26	8.2	8.4	RWW RWW RWW	21:14 22:12 23:10	Yes
June 24	Further PTWC actions							RWW RWW RWW RWW Cancellation	00:11 01:14 02:13 03:10 04:14 05:03	
June 26	Near the coast of Peru	04:18	17.0 S	71.1 W	40	6.6	6.8	TIB	05:07	Yes
July 5	Southern Peru	13:54	15.6 S	73.5 W	62	—	6.6	—		No
July 7	Near the coast of Peru	09:38	17.6 S	72.1 W	16	7.3	7.6	TIB	10:14	No
Aug 6	Southern region of the East Pacific Rise	03:53	55.6 S	123.3 W	10	6.5	6.7	—		No
Aug 21	East of North Island, New Zealand	06:52	36.5 S	179.7 W	35 (HRV)	6.9	7.0	TIB	07:32	No

23-24 June 2001 20:33 GMT—Peruvian Earthquake and Tsunami

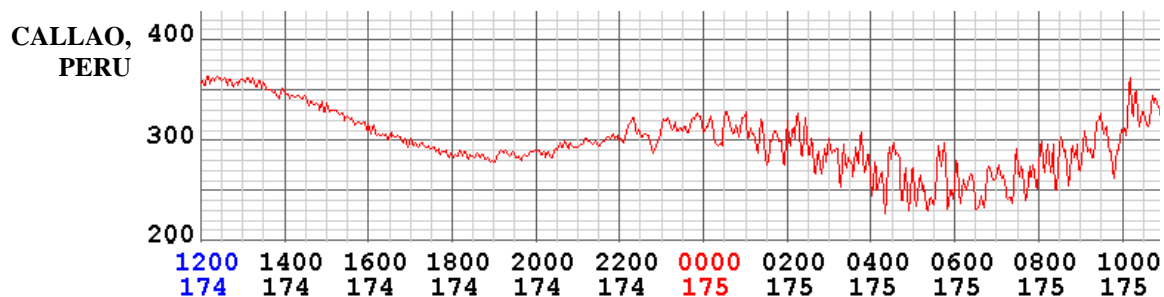
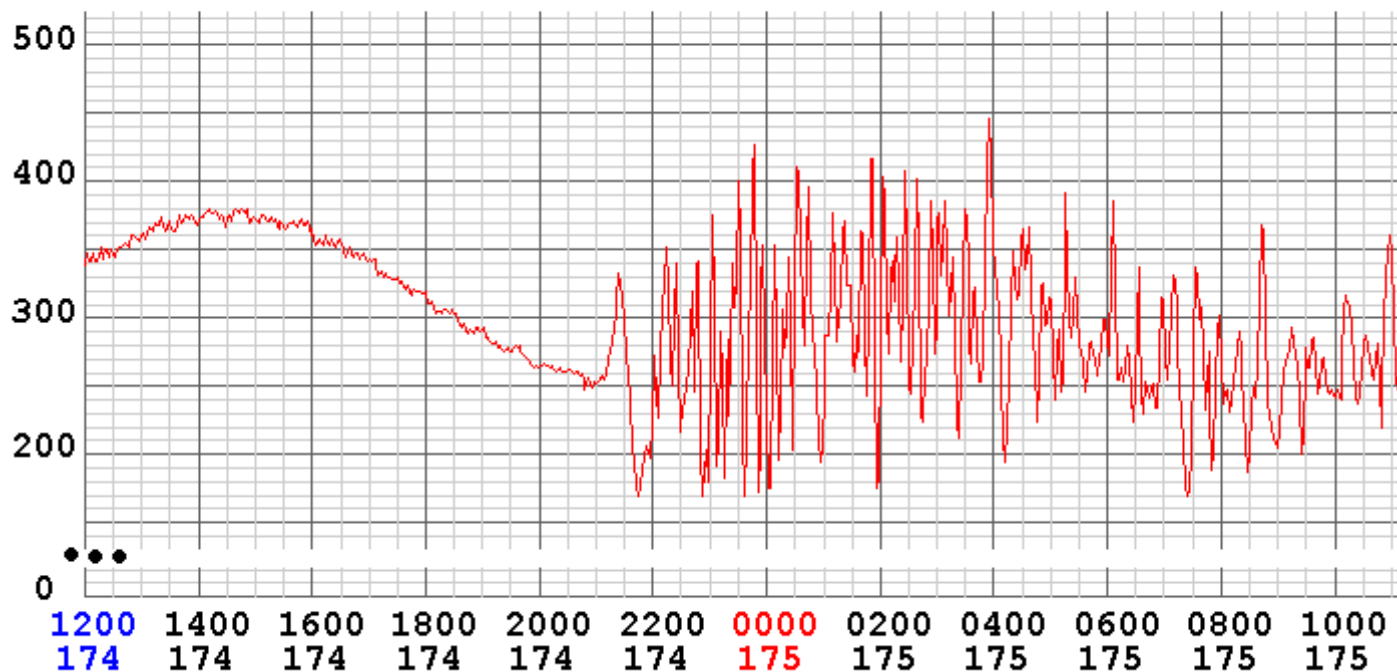
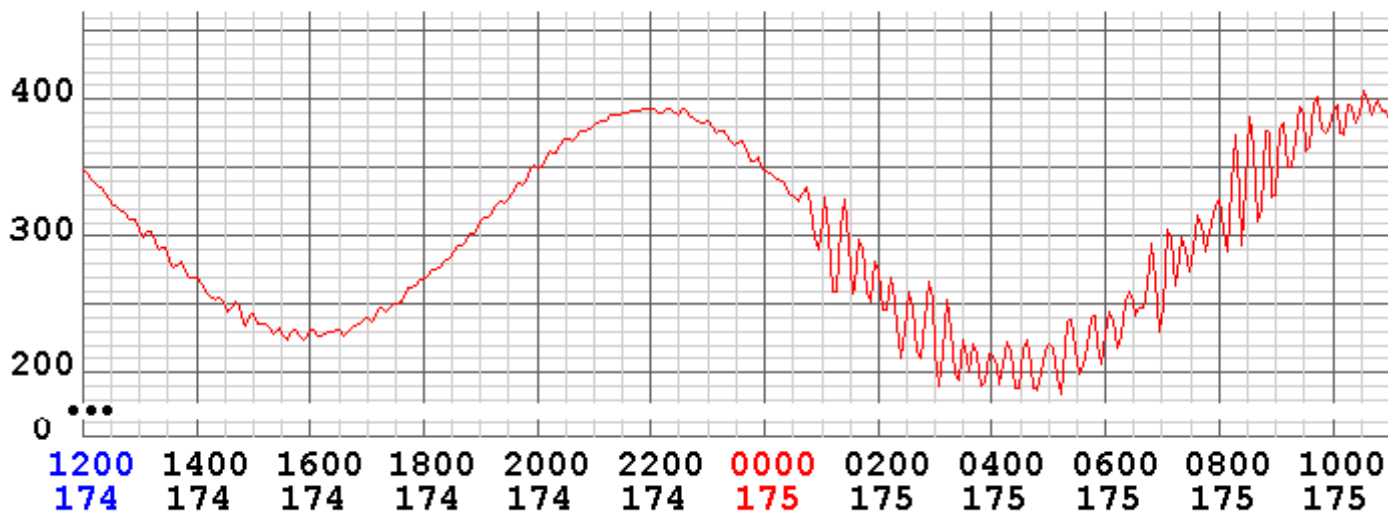
The earthquake that occurred in southern Peru at 15:33 local time on June 23, 2001, was the largest earthquake in over 25 years. Earthquake destruction centered inland around the towns of Arequipa, and Moquegua with at least 102 killed and 1,368 injured.

Given the size of this earthquake, the Pacific was immediately placed under alert for a possible tsunami. Along the southern coast of Peru, the tsunami was destructive. Twenty-one people are known to have died with over 60 people missing from the tsunami that occurred along the coast of Peru between Atico and Ilo. Most of the damage was limited to 30 kilometers of coastline, centered on Camana. It was in this area that the highest run-up (approx. 5 meters) was recorded and inundation reached nearly 1 kilometer inland along the Camana River estuary.

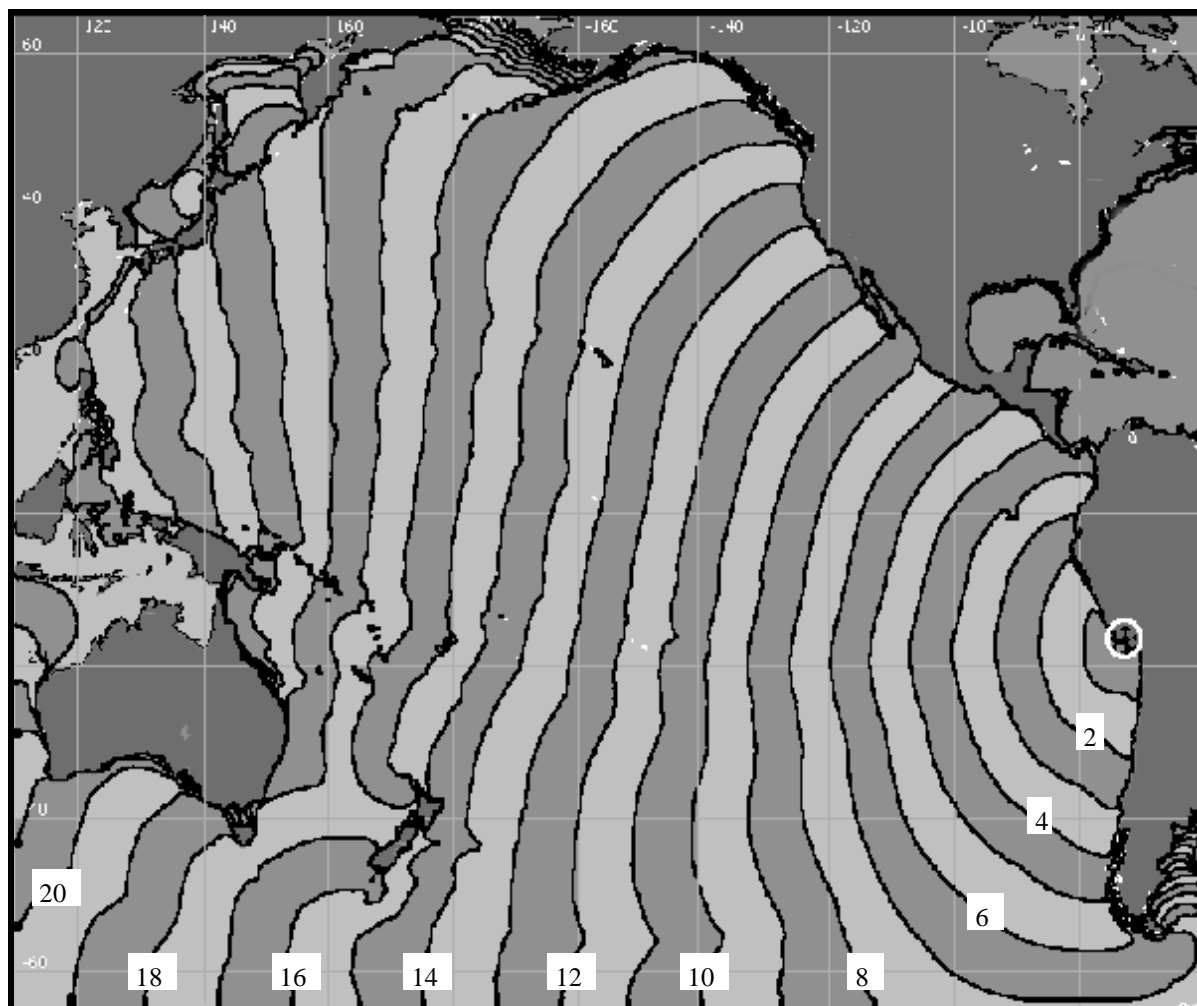
According to survey members, two factors kept the number of casualties from being higher: A) the fact that the earthquake occurred in the afternoon rather than several hours later, when Saturday night activities would increase the number of people down by the shoreline and B) the fact that initially the ocean receded. (Continued on page 8)



THE POST TSUNAMI SURVEY — The tsunami survey team included members from CICESE (Modesto Ortiz); The Peru Navy's Direccion de Hidrografia y Navegacion (Don Bermudez, Gustavo Laso, Daniel Olcese and Lt. Fernando Vegas); Humboldt State University (Sebastian Araya and Lori Dengler); Northwestern University (Brandon Gomer and Emil Okal); NOAA's PMEL (Shunichi Koshimura and Vasily Titov) and The University of Southern California (Jose Borrero and Matt Swenson). A report with maps and photos can be found at <http://www.usc.edu/dept/tsunamis/peru01/web%20pages/peru2001tsun.html>. Two papers from the survey team were presented at ITS 2001 (see p. 6).

A SAMPLING OF TIDE GAUGE RECORDS: 23-24 JUNE 2001**ARICA, CHILE****SANTA CRUZ, GALAPAGOS ISLANDS**

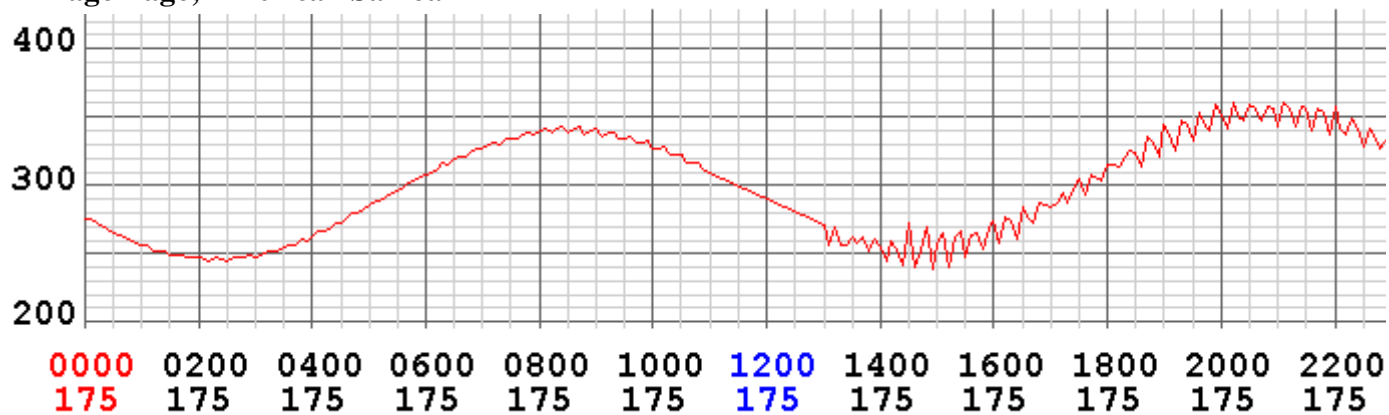
A TRAVEL TIME MAP FOR THE 23 JUNE 2001 PERU TSUNAMI MARKED WITH HOURLY INCREMENTS



PMEL has created a Web Compilation for this earthquake and tsunami at <http://www.pmel.noaa.gov/tsunami/peru20010623.html>. The tide gauge records printed here are available via that compilation either from The West Coast/Alaska Warning Center; (<http://wcatwc.gov/06-23-01.htm>) or the City of Kesennuma, Miyagi Prefecture, Japan. The Web Compilation lists several other sources for water level data, seismic data and links to modeling efforts.

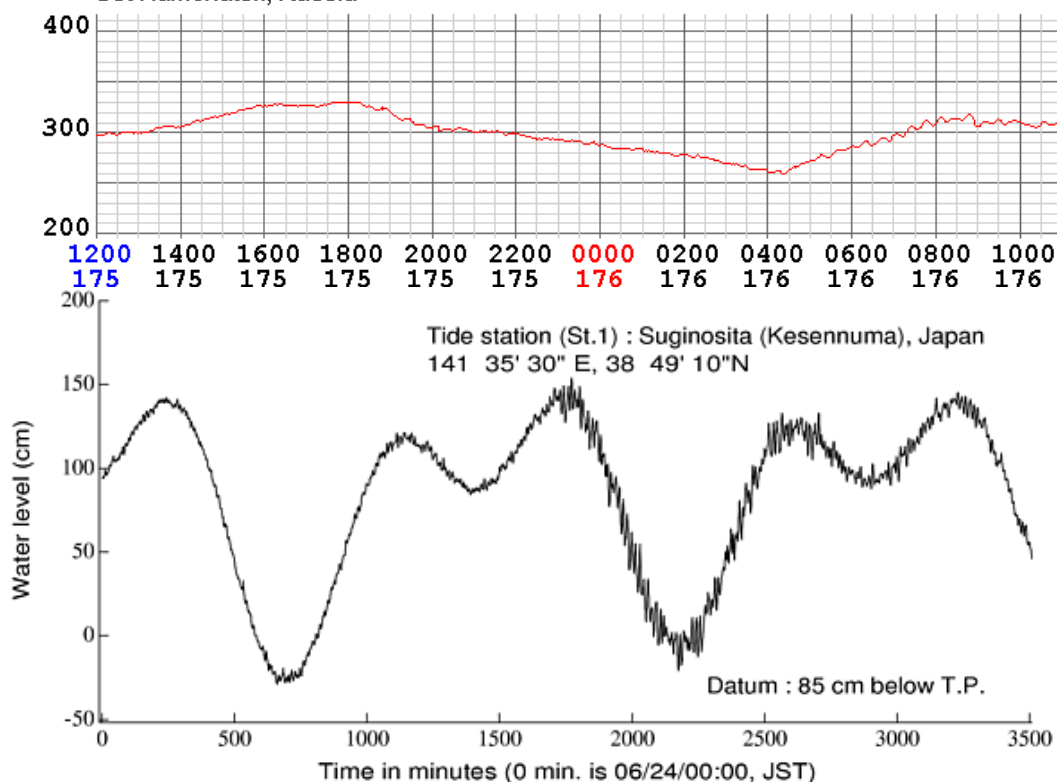
A SAMPLING OF TIDE GAUGE RECORDS: 23-24 JUNE 2001—con't

Pago Pago, American Samoa

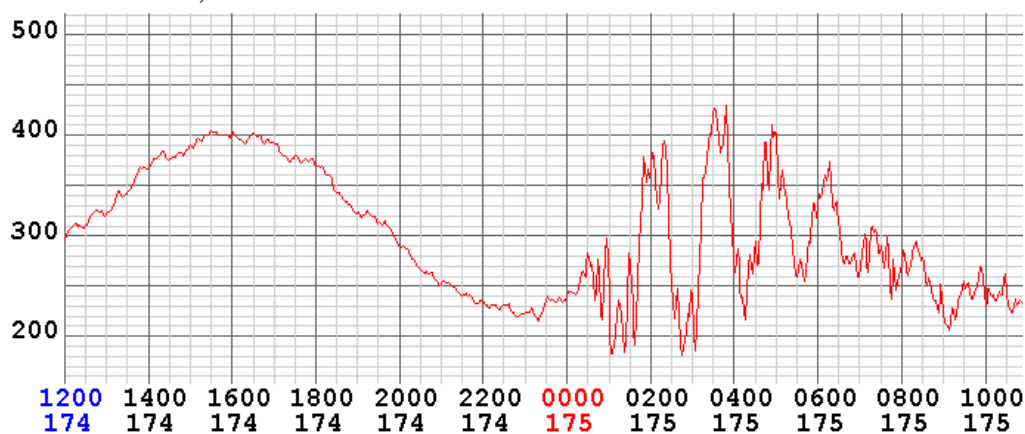


A SAMPLING OF TIDE GAUGE RECORDS: 23-24 JUNE 2001—Con't

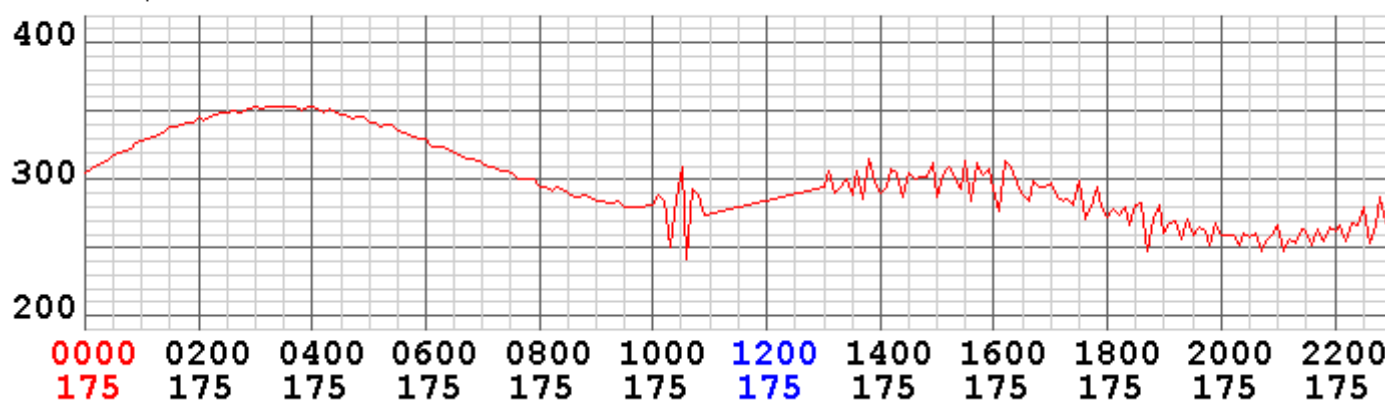
Ust Kamchatsk, Russia



Talcahuano, Chile



Hilo, Hawaii



International Tsunami Symposium 2001

Tsunami experts and emergency managers met at the University of Washington in Seattle, Washington, August 7-10 for a conference also known as ITS 2001. It was a symposium of international tsunami research with a strong local hazard mitigation element. On Tuesday, there was a review of the US National Tsunami Hazard Mitigation Program (NTHMP) led by Eddie Bernard of NOAA's Pacific Marine Experimental Laboratory (PMEL). Summaries were made of the efforts of the five US states involved in tsunami mitigation efforts in the Pacific. Speakers from all levels of government reported on aspects of the program. The review is a way of gauging progress and reassessing goals in the program, which has now been in effect for five years. Three independent parties are being asked to evaluate the results of the program as presented at this review.



Wednesday and Thursday were days devoted to planned sessions, filled with presentations and poster sessions. The sessions were organized around the topics; Tsunami risk assessment, PNG and recent tsunamis (including the June 2001 Peru tsunami), Tsunami geology and paleotsunamis, and Atlantic and Mediterranean tsunamis. On Thursday the sessions were: Tsunami measurement and data analysis, Landslides and other sources, and Advances in modeling applications. After each session, attendees would gather in a room across from the main auditorium for informal discussions while viewing posted presentations.

On Friday, a field trip was made to the southern coast of Washington. Along the Copalis River, Brian Atwater of the USGS, lead the group to evidence of tsunami deposits. These deposits are believed to be associated with Cascadia Subduction Zone earthquakes, most notably a major earthquake that occurred around 1700 AD. This event is recorded in a layer of sand found in soil samples that correspond to the date found in tree ring samples. It is further evidenced in historical documents from Japan. The group hiked along the river near to the forest of dead trees and watched as Brian demonstrated taking soil samples from the river bank and further inland. He showed the group how to make a permanent record of the sample with an adhesive, while further explaining the geologic surroundings. The group then drove to Ocean Shores, where a public forum was arranged by the local emergency manager, Karin Frinell-Hanrahan. People in the community had an opportunity to learn more about tsunami directly from researchers. Professor Nobuo Shuto discussed the tsunami hazard in Japan and other researchers posted explanations of their research on the walls.

The practical aspects of tsunami mitigation were an integral part of this symposium. It was an opportunity for emergency managers to meet tsunami researchers from around world, at the same time scientists were able to gain first hand exposure to efforts being made to localize tsunami warning in the United States. It is also noteworthy that the Mayor and Emergency Manager of Kesennuma, Miyagi Japan were at the meeting. It further demonstrates the emphasis on hazard mitigation efforts at the conference. Papers or abstracts of presentations will be available through the Internet until August 2003 at: <http://www.pmel.noaa.gov/its2001/>.

SESSION XVIII OF THE INTERNATIONAL COORDINATION GROUP FOR THE TSUNAMI WARNING SYSTEM IN THE PACIFIC (ICG/ITSU-XVIII)



The 18th Meeting of the International Coordination Group for the Tsunami Warning System in the Pacific, ITSU XVIII, will be held October 8-11 in Cartagena, Colombia. General Coordinator of the meeting is Captain Orlando Malaver Calderón, Executive Secretary of the Colombian Commission of the Ocean, who will be assisted by Lt. Cmdr. Julian Reyna Moreno of the Centro de Investigaciones Oceanográficas y Hidrográficas.

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Provisional agenda have been mailed out to National Contacts.

Prior to ITSU XVIII, on October 5 and 6, a workshop entitled, “*Tsunami Mitigation beyond 2000*” will be held. Co-conveners for this workshop are Dr. Viacheslav K. Gusiakov, Dr. François Schindelé, and Professor Hansjürgen Meyer. Contact information for this workshop was printed in the April issue of the Tsunami Newsletter. Please contact ITIC if you need more information.

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Peruvian Earthquake and Tsunami—Con't

The receding water level gave people a chance to move away from the coast before inundation began. Many people, were skeptical of the water receding as there is an adage in Spanish that cautions against retreating water. Other survivors were aware that after an earthquake, it is best to move away from shorelines. Therefore, there seemed to be a commendable level of hazard awareness among the population.

This event was calculated to have a magnitude of 8.2 on the Abe Tsunami Magnitude Scale. Indications of the tsunami were recorded on tide records across the Pacific.

For a comprehensive review of the earthquake including maps and links to additional sources of analysis, see the USGS National Earthquake Hazards Program at: http://earthquake.usgs.gov/activity/latest/eq_01_06_23/index.html.

WARNING CENTERS BENEFIT FROM NATIONAL MITIGATION EFFORT

During review of the US National Tsunami Hazard Mitigation Program at ITS 2001 (see page 4) it was pointed out how the National Weather Service's Tsunami Warning Centers (one of which is Pacific Tsunami Warning Center in Ewa Beach) have benefited from the program. The tsunami warning centers now receive much more data in real or near-real time, from seismic and water level recording stations not only in the Pacific but from all over the world. As a result, the amount of time it takes the warning centers to disseminate appropriate messages following a significant seismic event has been reduced by 50%.

The review also highlighted the significant progress made by PMEL and various state agencies in Pacific Coast inundation mapping. Many examples of programs designed to enhance public awareness of the tsunami hazard and measures that can be taken to reduce that hazard were presented by FEMA and the States.

INTERNATIONAL TSUNAMI INFORMATION CENTER (ITIC)



<http://www.shoa.cl/oceano/itic/frontpage.html>

Located in Honolulu, the **International Tsunami Information Center (ITIC)** was established on 12 November 1965 by the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO). In 1968, IOC formed an International Coordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU).

The Member States are presently:

Australia, Canada, Chile, China, Colombia, Cook Islands, Costa Rica, Democratic People's Republic of Korea, Ecuador, Fiji, France, Guatemala, Indonesia, Japan, Mexico, New Zealand, Nicaragua, Peru, Philippines, Republic of Korea, Singapore, Thailand, Russian Federation, United States of America, and Western Samoa.

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