FEBRUARY 2003 VOLUME XXXV, NUMBER 1

Tsunami Newsletter

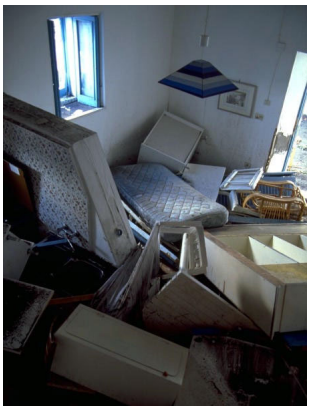
INTERNATIONAL TSUNAMI INFORMATION CENTER - ITIC

SUMMARY OF EARTHQUAKES IN THE PACIFIC
Occurring December 2002-January 2003

With surface wave or moment magnitude (M_w) greater than or equal to 6.5 and a depth no greater than 100 km, or an event for which a Tsunami Information Bulletin (TIB) or Regional Watch Warning (RWW) was issued. Epicenter and M_W from USGS National Earthquake Information Center (NEIC, G); preliminary M_S from PTWC (P) at time of action; M_W and depth from Harvard (H).

DATE	LOCATION	TIME (UTC)	LAT	LONG	DEPTH (km)	M_W	M_S	PTWC ACTION	ACTION TIME (UTC)	Damaging Tsunami ?
Jan 20	Vicinity of Solomon Islands	08:43	10.478 S	160.749 E	38	7.2(G) 7.3(H)	7.3 7.7 7.7	TIB RWW #1 RWW #3 (#3 cancel)	09:02 09:34 10:37	NO
Jan 22	Offshore Colima, Mexico	02:07	18.837 N	103.817 W	33	7.8(G) 7.4(H)	7.6 7.3	RWW #1 RWW #2 (#2 cancel)	02:50 02:59	NO

OCTOBER 10 2002, FOLLOWUP: Based on correspondence with Gegar Sapta Prasetya of the Agency for Marine and Fisheries Research, Indonesia Ministry of Marine Affairs and Fisheries, and Dr. Fauzi Rades, National Earthquake Center Coordinator at Indonesia's Meteorological and Geophysical Agency, no formal report of a tsunami occurence will be prepared in response to the devasting October 10, 2002 earthquake in the Irian Jaya Region. According to Dr. Prasetya. subsidence along the coast was the probable cause of the coastal flooding found along the Oransbari coast. In addition, his staff sent to the area to investigate had no reports from people in Biak and Jayapura that they had experienced a tsunami.

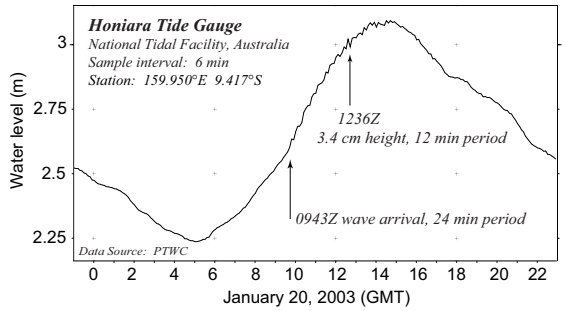


Stromboli Tsunamis

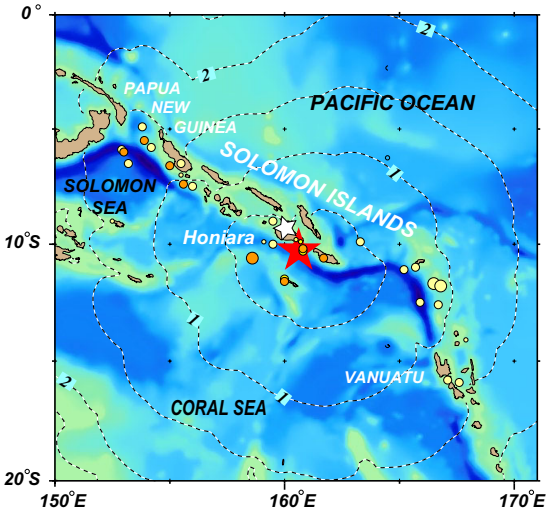
(interior damage photos from http://www.stromboli.net/)

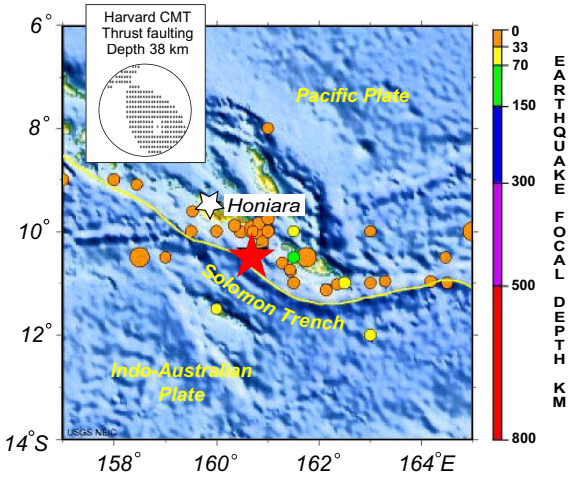
Two tsunamis were generated by landslides occurring on December 30, 2002 at 13:15 and 13:22 UTC, as reported in the *Bulletin of the Global Volcanism Network* (December 2002). Two large volumes of rock slid into the sea at Sciara del Fuoco generating the tsunamis, each with waves several meters high. The waves innundated the villages of Stromboli and Ginostra, causing damage (see photos to left). Six people were evacuated and taken to hospitals on Sicily. The volume of the first and largest landslide was estimated to be about 6 million cubic meters.

SOLOMON ISLANDS 20 JAN 03 08:43Z 10.5º S 160.7º E M_S=7.8 (G) M_W=7.3 (H)



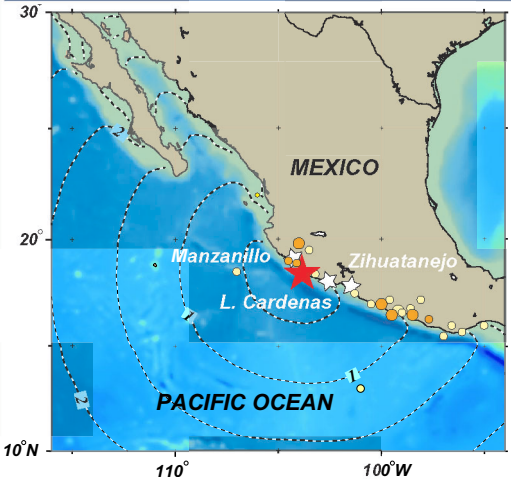
This earthquake caused strong shaking in the capitol of Honiara, where people fled swaying buildings. Based on the earthquake's size, PTWC issued a tsunami warning for Nauru, New Caledonia, Kosrae, Pohnpei, the Marshall Islands, Fiji, and Chuk, and a tsunami watch for Samoa, New Zealand, American Samoa, Guam, Wake, Northern Marianas, Yap, Belau, Marcus Island. Johnston Island, Kiribati, the Cook Islands, and Midway. These messages were cancelled 63 minutes later, once water level data indicated that no Pacific-wide tsunami had been generated. A small tsunami was registered on the Honiara water level station (see figure). Workers at the Tawatana village clinic on Makira Island, near the main island of Guadalcanal, reported a 2 m wave and the sea rising and falling with residents seeking safety on higher ground, but no major damage or deaths are known to have occurred (ABC Radio Australia). New Zealand's National Institute of Water and Atmospheric Research (NIWA) reported their sea-level network registered no remarkable waves.



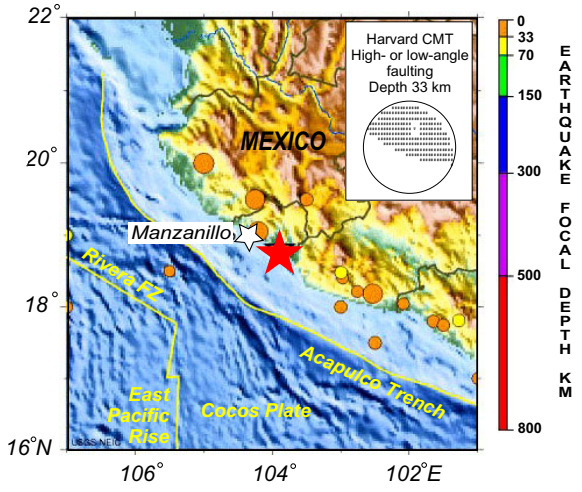


Seismicity maps from USGS/NEIC (M7 of greater earthquakes since 1900; plate boundaries shown in yellow; current epicenters as red and cities as white stars). Tsunami travel time maps from PTWC.

COLIMA, MEXICO 22 JAN 03 02:07Z 18.8º N 103.8º W M_S=7.4 (G) M_W=7.4 (H)



This earthquake caused strong shaking in the epicentral region and a small non-destructive tsunami. PTWC issued a tsunami warning for Mexico, El Salvador, and Nicaragua, and a tsunami watch for Ecuador, Colombia, and Panama, but these were cancelled 59 minutes later after the receipt of additional seismic data showed the earthquake's magnitude to be smaller and below the tsunami warning/watch threshold. More information is found in the following related article.



Quick Field Survey of the 22 January 2003 (M 7.8) Colima-Mexico Earthquake-Tsunami

submitted by Modesto Ortiz, Juan I. González, Norma A. Ramírez-Mondragón, and Salvador F. Farreras, Departamento de Oceanografía Física,Centro de Investigación Científica y de Educación Superior de Ensenada, B.C., México.

The 22 January 2003 (M_W 7.8) earthquake near Colima, Mexico triggered a tsunami that was recorded at Manzanillo-Colima 12 minutes after the origin time of the earthquake (02:06:35 UTC). The first arrival of the tsunami had a clear emergent character. The height of the first peak was +28 centimeters above the tide level at that time, and was followed by a maximum height (trough to peak) of 122 centimeters. The tide gauge in Manzanillo is approximately 50 km NW of the preliminary epicenter that was reported by the National Earthquake Information Center (18.807ºN, 103.886ºW). The tsunami was also recorded in Lazaro Cardenas-Michoacan, 200 km SE from the epicenter, and in Zihuatanejo-Guerrero, 278 km SE from the epicenter. Figure 1 illustrates the tsunami records from Manzanillo, Lazaro Cardenas, and Zihuatanejo. Notice that the maximum height of the tsunami in Zihuatanejo occurs 4 hours after the earthquake. (Locations of the mentioned cities are shown in Figure 2.)

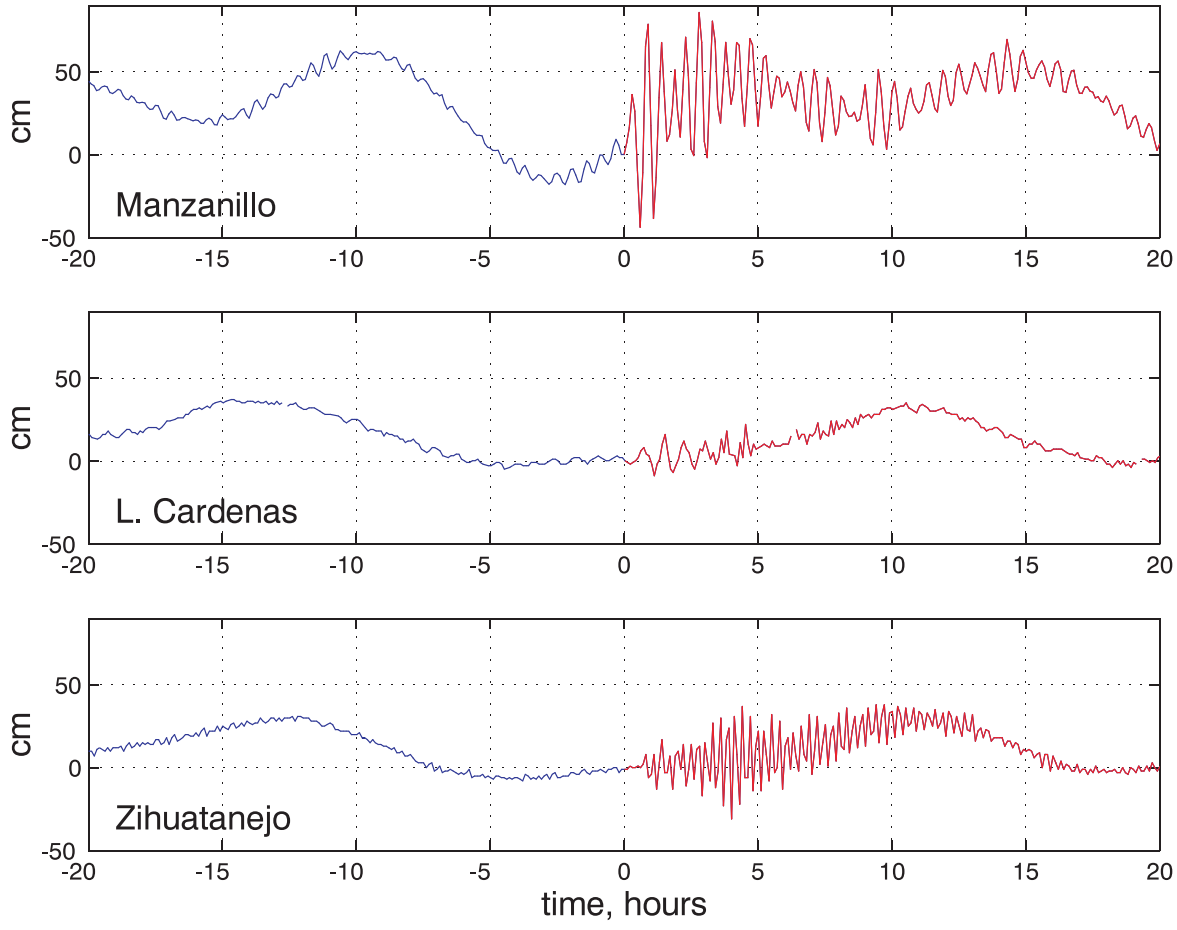


Figure 1. The 22 January 2003 tsunami as recorded in Manzanillo-Colima, Lazaro Cardenas-Michoacan, and Zihuatanejo-Guerrero. The origin of the time axis is taken as the origin time of the earthquake (02:06:35 UTC; 20:06:35 local time).

Colima-Mexico Eartquake-Tsunami, *continued*

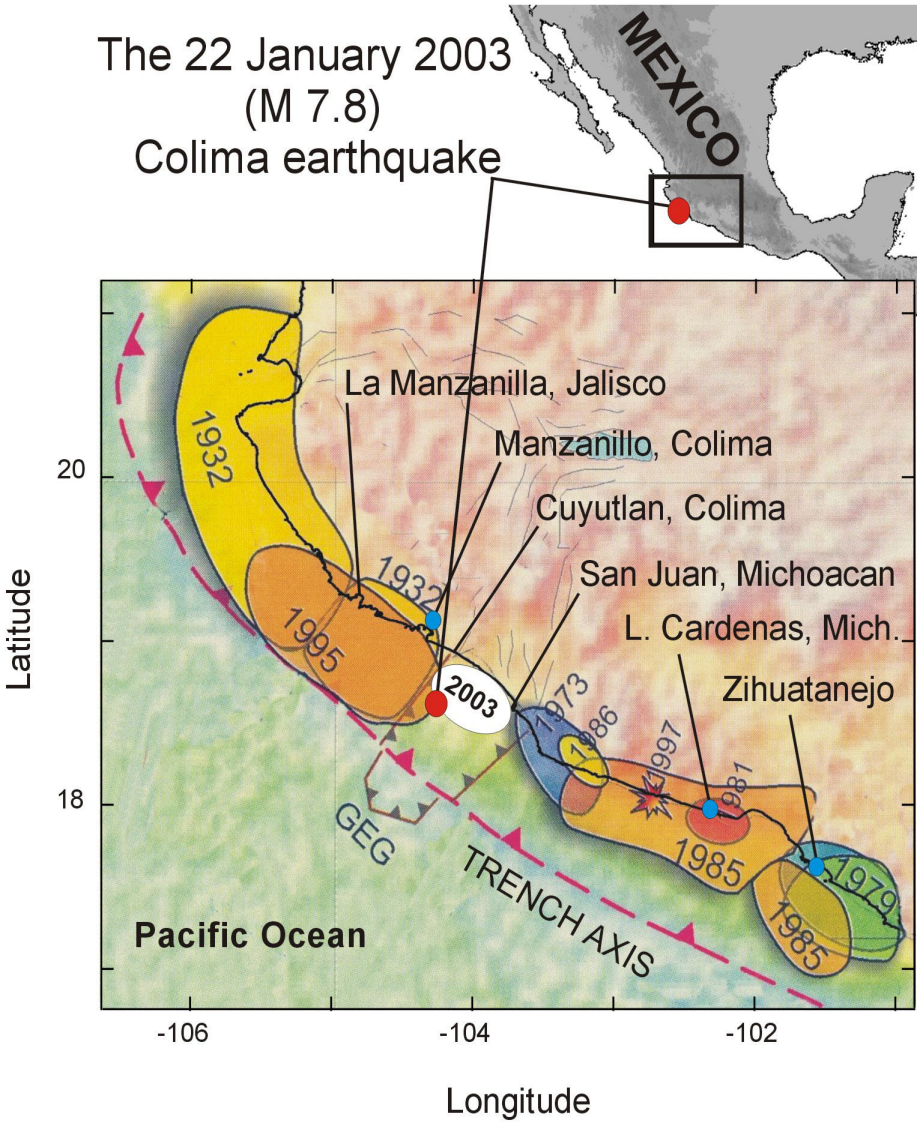


Figure 2. Rupture areas of the largest subduction-type earthquakes since 1932 (figure adapted from Kostoglodov and Pacheco, 1999). The rupture area of the 22 January 2003 earthquake is preliminary and conjectural, based on the structural damage found during the quick field survey along the coast from La Manzanilla to San Juan. Notice that the 2003 rupture is located above the graben El Gordo (GEG); this region is considered to represent a seismic gap over the last century.*

**A graben is a geological structure that defines the subsidence of a large mass of rock by normal faulting.*

Eyewitnesses interviewed by telephone the day after the earthquake reported NO tsunami in Manzanillo (report from Oceanographic Institute of the Navy), NO tsunami along the coast of Jalisco (reports from Barra de Navidad and Melaque), and NO tsunami in the Port of Lazaro Cardenas, Michoacan (report from the Captain of the Port). Note that it was night at the time of the earthquake, which made it difficult for eyewitnesses to observe sea level fluctuations that did not overpass the higher part of the beach (the winter berm), which is on the average 1-2 meters above the high tide level along the coasts of Jalisco, Colima, and Michoacan.

A field survey was conducted on January 26-28 along the coast, from La Manzanilla-Jalisco to San Juan-Michoacan, to seek tsunami traces and to determine how the people living near the coast responded to the possible tsunami. Results of the survey confirmed that no tsunami flooding occurred along the entire surveyed coast. It was also confirmed that the height of the tsunami along the coast was approximately the height of the high tide, as recorded in Manzanillo, and that it was difficult for the untrained eye to observe sea level fluctuations within the tidal range.

Large structural damage by the earthquake was found only on the southeast segment of the coast of Colima, from Cuyutlan to a few kilometers before San Juan, where in each one of the towns at least one concrete building was completely damaged by the shaking. Figure 3 shows a typical example of the

Colima-Mexico Earthquake-Tsunami Survey, *continued*

Figure 3 Typical structural damage found along the SE segment of the coast of Colima. a-Cuyutlan-Colima. b- El Tecuanillo-Colima.

damage found along this segment of the coast. No structural damage was found in San Juan, nor along the coast north of Cuyutlan; nor along the coast of Jalisco.

Based on the epicentral location and on the structural damage, we assumed the preliminary location of the rupture area to be over "El Gordo" Graben (GEG in Figure 2). This region (GEG) is considered to represent a seismic gap over the last century. The landscape along the coast in this region is almost flat (approximately 1-2 meters above the high tide level) and has no hills behind the beach. It is evident that if there had been a moderate tsunami, the destruction would have been large.

The people living near the coast where the shaking was strong (Cuyutlan, El Paraiso, Boca de Pascuales, El Real, El Tecuanillo, San Rafael, Boca de Apiza, and San Juan) were completely frightened by the shaking but did not immediately evacuate. However, on the night of the earthquake they slept or camped away from the coast because they were worried about a possible tsunami. No attempts were made by local officials to order evacuations. This coast was not flooded during the 9 October 1995 Jalisco tsunami. In contrast, people living along the coast of Jalisco, which experienced tsunami flooding in 1995, evacuated immediately after the earthquake.

In particular, the entire population of La Manzanilla and the neighboring town of Boca de Iguanas, both of which were completely inundated during the 1995 tsunami (Borrero et al., 1997), evacuated within 15 minutes after the earthquake to higher ground, and volunteers watched the sea during the night in case a tsunami arrived. A tsunami warning sign was posted by the local community in Boca de Iguanas after the 1995 experience. This tsunami warning sign (Figure 4) is the only one known to exist along the entire Pacific Coast of Mexico.

References

Borrero J., M. Ortiz, V. Titov, and C. Synolakis, 1997. Field Survey of Mexican Tsunami Produces New Data, Unusual Photos. Eos, Trans. AGU., 78, 8.

Kostoglodov V., and J. F. Pacheco, 1999. Cien Años de Sismisidad en Mexico. POSTER at Servicio Sismologico Nacional, IGF, UNAM: *http://www.ssn.unam.mx*.

Acknowledgements

We thank the sea-level network of the Secretaría de Marina de Mexico for providing the tsunami data. The field survey was partially supported by NIED (National Research Institute for Earth Science and Disaster Prevention-Japan).

Figure 4. *Tsunami Warning sign in Boca de Iguanas. It reads as follows: IF SHAKING! LOOK FOR HIGHER PLACES, THE SEA MAY COME OUT. A local plan to protect ourselves.*

Puerto Rico Tsunami Protocal Meeting held in Mayagüez, Puerto Rico

contributed by Christa von Hillebrandt, Director, Puerto Rico Seismic Network (PRSN) and Co-Investigator, Puerto Rico Tsunami Warning and Mitigation Program.

In October 2000, with funding from the U.S. Federal Emergency Management Agency (FEMA) and the University of Puerto Rico (UPR), the Puerto Rico Tsunami Warning and Mitigation Program (PRTWMP) was established. As part of this program, the following tasks were delineated:

1. Prepare and supply tsunami flooding and evacuation maps for Puerto Rico. These are now available at http://poseidon.uprm.edu.
2. Raise the awareness of the potentially affected population. This has been accomplished through 6 Regional workshops held throughout the island about tsunamis and their threat. And a tsunami video (in Spanish) was made and has been distributed. Tsunami warning signs are also being prepared and will be installed along the coast. Two tsunami drills in schools are to be conducted.
3. Evaluate the incorporation of seismic waveform data from local, regional, national and global seismic networks for tsunami warning purposes. Dr. Carlos Mendoza and Víctor Huérfano developed and adapted, for the Puerto Rico Seismic Network, programs for calculating earthquake parameters for regional and local events, respectively.
4. Develop warning messages and protocol in the event that a potentially tsunamigenic event is detected.
5. Develop an Atlantic/Caribbean Historical Tsunami Database. This was put together by Dr. V. Gusiakov.
6. Promote and seek support and partnerships at state and federal level for long term tsunami hazard mitigation. Members of the program have attended meetings of the US Tsunami Hazard and Mitigation Program.

As part of tasks 4 and 6, a “Tsunami Protocol Meeting” was held at the Mayagüez Campus of the UPR during the 15-16th of January 2003. The objective of this meeting was to set the groundwork for a tsunami warning system capable of rapid dissemination of information throughout the Caribbean on potentially tsunamigenic events in Puerto Rico and the Virgin Islands (VI). The meeting was convened by Prof. Aurelio Mercado of the Marine Science Dept. and Christa von Hillebrandt, Director of the Puerto Rico Seismic Network. It was attended by the directors of the Richard H. Hagemeyer Pacific Tsunami Warning Center (PTWC), the West Coast/Alaska Tsunami Warning Center (WC/ATWC), the National Weather Service Pacific and Southern Regions, International Tsunami Information Center (ITIC) and representatives from the IOCARIBE Group of Experts on Tsunamis, the Puerto Rico Sea Grant Program, the Caribbean Disaster Emergency Response Agency (CDERA), the Puerto Rico State Emergency Management Agency (PRSEMA), FEMA, the University of the Virgin Islands (UVI), and the University of Puerto Rico at Mayagüez.

After two days of presentations and discussions, the following 14 action plans were developed and approved. Implementation is planned for the coming year.

Action Item # 1: Establish a PR-VI Tsunami Technical Review Committee (PRVITTRC). The Committee should initially include a representative of each of the Emergency Management offices of PR, VI, British Virgin Islands (BVI), and the NWS Puerto Rico Forecast Office (PRFO), research community and the Puerto Rico Seismic Network, National Tsunami Warning Program. Eventually this committee should be expanded to include representatives of other parts of the Caribbean, including the Dominican Republic, Jamaica and the Eastern Caribbean. (Leader: PRSN to be transitioned to PRSEMA)

Tsunami experts discussed requirements needed to establish a Puerto Rico Tsunami Warning System during the January 2003 meeting. From left, Melissa Bailey, NWS Southern Region Marine Programs, Professor Roy Watlington, UVI, Professor George Maul, IOCARIBE Group of Experts and Florida Institute of Technology, Paul Whitmore, WC/ATWC Geophysicist-in-Charge, Israel Matos, NWS PRFO Meteorologist-in-Charge, William Proenza, NWS Southern Region Regional Director.

Tsunami Protocal Meeting, *continued*

On the last day of the meeting, participants visited coastal locations inundated by the 1918 tsunami. Pictured from left: meeting convenors Christa von Hillebrandt and Professor Aurelio Mercado, UPR, Jeff LaDouce, NWS Pacific Region Regional Director, Jose de Castro, BVI Disaster Management, Professor George Maul, IOCARIBE Group of Experts and Florida Institute of Technology, Dr. Chip McCreery, PTWC Geophysicist-in-Charge, Donovan Gentles, Caribbean Disaster Emergency Response Agency, Dr. Laura Kong, ITIC Director, Dr. Kurt Grove, UPR Sea Grant Program.

Action Item # 2: Prepare tsunami information, advisory, watch, and warning messages. (Leader: NWS)

Action Item # 3: Implement redundant communication between PRSN, PRSEMA and NWS. Identify points of contact for distributing tsunami messages in the VI and Caribbean. (Leader: PRSN)

Action Item # 4: Prepare PR-VI Tsunami Warning Protocols/Operational Plan for local and teletsunamis.(Leader: PRSN transition to PRSEMA)

Action Item # 5: Submit to Directors of Pacific Region and Southern Region NWS proposal for a PR-VI Tsunami Warning and Mitigation System (Leader: PRSN).

Action Item # 6: Explore possible sources of NOAA funding for a PR-VI Tsunami Warning and Mitigation Program. (Leader: Director Pacific Region NWS)

Action Item # 7: Explore possible sources funding (both regional and other) for the PR-VI Tsunami Warning and Mitigation Program. (Leader: PRSN)

Action Item # 8: Prepare action plan to conduct local training/outreach for public safety managers and general population. (Leader: PRSEMA)

Action Item # 9: Identify priorities for tsunami research. (Leader: Aurelio Mercado)

Action Item # 10: Complete installation of water level instrumentation in PR, including a GPS survey. Install an alert base station in the PRSN. Provide recommendation for installation for water level instrumentation outside of the Caribbean region. (Leader: PRSEMA with assistance of NWS)

Action Item #11: Identify resources for installing a seismic station in the eastern Dominican Republic. (Leader: PRSN)

Action Item #12: Recommend to National Ocean Survey/Virgin Islands Territories Emergency Management Agency the upgrade of sea level instrumentation in the Virgin Islands. (Leader: UVI)

Action Item #13: Provide tsunami orientation and tsunami warning process training to the Weather Forecasting Office in Puerto Rico. (Leader: Director Pacific Region NWS)

Action Item #14: Coordinate delivery, distribution and approved usage of National Earthquake Information Center seismic information/products for use in developing Puerto Rico and Virgin Islands Tsunami Warnings. (Leader: PRSN)

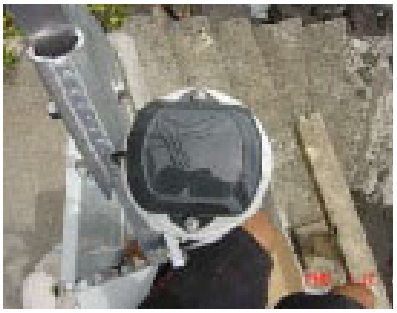
If these action items are carried out, not only will a PR-VI Tsunami Warning System be established, but the groundwork for a more comprehensive PR-VI Warning and Mitigation Program would be started. As the end of the funding (March 2003) for the PRTWMP approaches, we feel we have met the project objectives, and as a result the tsunami threat is being taken more seriously by the general public and the local government. We strongly feel that sources of funding need to be identified to continue the program and extend it to the Virgin Islands.

PTWC NEWS

During the last two weeks of January 2003, two sea level stations were installed on the Marquesas Islands of Hiva Oa and Nuku Hiva by PTWC Senior Electronics Technician Richard Nygard with logistical and technical assistance from Dr. Dominque Reymond and Mr. Taata Tchoung Yao of the Laboratoire de Geophysique (LDG) in Papeete, Tahiti. Funding for the new Hiva Oa station was provided by France and LDG will operate the station with assistance from Mr. André Terrier of Meteo France. This station is located at Tahauku Bay, an area that has been especially sensitive to tsunami arrivals in the past. On Nuku Hiva, Mr. Nygard replaced and relocated a PTWC sea level station that had been inoperative for several years, moving it to the south side of a new wharf. This station will be operated by PTWC with assistance from a local Nuku Hiva resident, Mr. Bernard Aumaitre. Both systems use the Handar 555 data collection platform with a Druck PTX 1830 pressure sensor mounted a few feet below the sea surface. Their data are transmitted back to PTWC, LDG, and other users on an hourly schedule through the GOES Satellite. The two stations will provide important observations of tsunami waves as they propagate across the Pacific, particularly from sources in South and Central America. On his return to Hawaii through Papeete, Mr. Nygard visited LDG and its Centre Polynesien de Prevention des Tsunamis (CPPT), where he received a tour of the facility and met with members of the staff.

In Hiva Oa, the pressure sensor site (left), located adjacent to the hillside, required considerable effort to install.

The Handar 555 DCP, solar regulator and battery contained in a weather-tight enclosure (below right, top) are mounted along with the GOES antenna, 20w solar panel, and GPS clock (below right, bottom) at a wharf fronting the bay. Pictured below are Mr. Taata Tchoung Yao of LDG, Mr. Richard Nygard of PTWC, and Mr. André Terrier of Meteo France at the DCP site in Hiva Oa.



At left, Mr. Yao and Mr. Nygard at Nuku Hiva's system installation, and below, a view of the new wharf 's south side where the tide gauge is now located.

2003 ITSU Officers Meeting Executive Summary

The 2003 Meeting of the Officers of the International Co-ordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU) was held between 10 and 13 February 2003, hosted by the International Tsunami Information Center (ITIC) in Honolulu, Hawaii.

The Session was attended by Dr. François Schindelé (Chair), Dr. Charles McCreery (Vice-Chair), Captain Hugo Gorziglia (Past Chair), Dr. Laura Kong (Director ITIC), Dr. Rodrigo Nuñez (Associate Director ITIC), Mr. Mike O'Leary (Local Organizer, ITSU-XIX, New Zealand) and Mr. Peter Pissierssens (Technical Secretary, IOC).

The Officers proceeded with an extensive review of the ITSU-XVIII Action Sheet, including over 200 action items adopted at that Session. The Officers noted good progress. The following items are highlighted:

- The Officers adopted a revised format for National Reports. Information on tsunami occurrences and on member National Sea Level Networks should be included. A Circular Letter will be issued inviting Member States to submit their national reports by August 2003, using this format;
- The Russian versions of 8 textbooks are now available in Russian and will be posted on the ITSU and ITIC web sites after editing of the translated text;
- The Secretariat will issue a Circular Letter inviting Member States to more actively contribute content for the *Tsunami Newsletter*;
- A list of requirements for the further maintenance of the HTDB database will be prepared for ITSU-XIX;
- A 1-day HTDB training workshop is planned to take place in parallel with the Workshop that will be held prior to ITSU-XIX (New Zealand, October 2003);
- The Officers considered that the term 'Visiting Experts Programme' is misleading as the programme focuses on training in tsunami warning, and recommended that it be renamed to 'ITSU Training Programme'. The next ITSU Training Programme is planned to take place in August 2003. A Circular Letter will be issued by the Secretariat in March;
- The Officers suggested that an ITSU communication strategy be developed that clearly defines the terms of reference of each communication tool (e.g., Newsletter, web sites, special publications, etc.);
- The Officers extensively reviewed the draft of the 'Tsunami Press Kit'. The Officers observed that the term 'Press Kit' did not adequately describe the product and decided to rename it to 'Tsunami Information Kit'. The product will be finalized by April 2003 and will be presented at ITSU-XIX;
- The Tsunami Glossary will be made available for download from the ITSU/ITIC web sites. Chile offered to print the English and Spanish versions. A French version will also be produced. The need for a Russian version will be discussed with the Russian National Contact;
- The Officers decided that all ITSU printed products should have the same 'corporate branding' and they

ITSU Officers Meeting participants pose for group picture on the last day. Front, from left, Peter Pissierssens, UNESCO/IOC and ITSU Technical Secretary, Dr. Laura Kong, ITIC Director, Dr. François Schindelé, ITSU Chair. Back, from left, Dr. Chip McCreery, ITSU Vice-Chair, Dr. Rodrigo Nuñez, ITIC Associate Director, Mike O'Leary, New Zealand ITSU National Contact, Linda Sjogren, ITIC Librarian, Captain Hugo Gorziglia, past ITSU Chair

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2003 ITSU Officers Meeting Executive Summary, *continued*

decided on the graphic elements to be used;

- The Officers decided that the ITSU web presence should be composed of two sites: (i) the ITIC web site (hosted by ITIC) that concentrates on a general public audience; and (ii) the ITSU web site (hosted by IOC) that concentrates on an 'expert' audience;
- The Officers recommended that the ITSU programme support the International Tsunami Workshop in Indonesia to commemorate the 120th anniversary of the 1883 Krakatoa eruption and tsunami;
- Concrete recommendations were made by the ad hoc study group on a standard set of symbols and signs, and these will be reported to ITSU-XIX;
- Closer collaboration will be sought with ISDR;
- The Officers identified some possible Tsunami Programme Evaluation team members and recommended that the ITSU Evaluation be implemented for presentation to the 2004 Session of the IOC Executive Council;

The Officers then discussed preparations for ITSU-XIX. They reviewed the basic working documents (agenda, working documents) and were given an overview of the plans by the local organizer. ITSU-XIX will take place between 29 September and 3 October, in Wellington, New Zealand at the Wellington Convention Center. A Circular Letter will be issued by the Secretariat by the end of March inviting Member States to identify participants.

Continuing the tradition of previous ITSU Sessions, ITSU-XIX will be proceeded by a joint IUGG/ITSU Workshop that will be entitled "Tsunamis in the South Pacific". The Workshop will take place between 25 and 26 September, at the Wellington Convention Center. The event will be organized jointly by the IUGG Tsunami Commission (IUGG/TC), the Institute of Geological and Nuclear Sciences (GNS) of New Zealand, and ICG/ITSU. The convenors will be Viacheslav Gusiakov (Russia), François Schindelé (France) and Gaye Downes (New Zealand). The objectives of the Wellington workshop are: (1) to review the situation with tsunami observations and preparedness in the South Pacific area; (2) to analyze the regional features in tsunami generation, propagation and impact; (3) to exchange national experiences on the development of countermeasures; (4) to formulate recommendations on the actions required for tsunami disaster reduction.

From left, Dr. Rodrigo Nunez, Mike O'Leary, Dr. François Schindelé, Peter Pissierssens, and Captain Hugo Gorziglia.

The Officers noted that both the Chair and Vice Chair are due for replacement as they have served two terms. The Officers requested the Secretariat to send a Circular Letter that quotes from the IOC Manual, that an election should be organized and that the Member States can re-elect, for exceptional reasons, the current Chairs.

The Officers received an extensive overview of the activities undertaken by ITIC during the inter-sessional period, noting Dr. Laura Kong as the new ITIC Director, replacing Mike Blackford who retired in February 2002. In September 2002, ITIC was able to hire Tammy Kaitoku as its Web/Internet Resource Assistant to provide support for ITIC in maintaining and developing its web pages. Kaitoku has been working with Linda Sjogren, ITIC Technical Information Specialist, to enhance the ITIC USA web site. The following ITIC activities were highlighted:

- Conducted the Visiting Experts Programme, now renamed the ITSU Training Programme. for two foreign scientists in June, 2002;
- Published the *Tsunami Newsletter*, revised and reprinted *Tsunami: The Great Waves* brochure, and created other tsunami awareness materials;
- Coordinated the technical assistance visit of Mr. Emilio Lorca to Colombia and Ecuador;
- Assisted INOCAR (Ecuador) student on his thesis to set the theoretical basis for an Ecuadorian Tsunami Warning System;

2003 ITSU Officers Meeting Executive Summary, *continued*

- Assisted Colombia in identifying which equipment to install for a new sea-level network that would have the capability of sending data in near real-time;
- Improved and enhanced the ITIC USA web site by implementing new structure and look, with focus on information of interest to the public. Materials were downloaded and/or linked to the ITIC Chile site, old pages streamlined to improve ease of navigation, and new pages developed to add content;
- Increased ITIC library collection through acquisition and contribution of new materials, and developed capabilities for putting the ITIC library catalogue online as a searchable database;
- Attended 4 international meetings.

The Officers completed the meeting by drafting the 2003 work plan and budget, which includes these items:

- ITIC Support Contract;
- Tsunami Public Awareness products development (printing of Spanish and English version of the Glossary; publication of the Tsunami Information Kit);
- ITSU Programme Development (Staff travel and HTDB development);
- ITSU Regional Programmes (Workshop 'Tsunamis in the South Pacific; HTDB training course, Krakatoa Commemorative Conference).

UPCOMING CONFERENCES

April 6 - 11, (Sunday-Friday) **Tsunamis** at the **EGS-AGU-EUG Joint Assembly** to be held in Nice, France. Conveners are Professor Stefano Tinti (steve@ibogfs.df.unibo.it) and Professor Efim Pelinovsky (enpeli@hydro.appl.sci-nnov.ru).

The aim of the symposium (NH6.01) is to consider state-of-the-art research in tsunami generation, propagation and impact along the coasts, including discussion of tools to assess and mitigate tsunami hazards. Contributions from different disciplinary fields such as geophysics, geology, numerical modelling, social and economical sciences, urban planning, warning and early-warning systems, all aspects of tsunami research theoretical, numerical, experimental and observational studies (including remote sensing) are welcome. Instructions for preparation and submission of abstracts, as well as details regarding registration, accommodation, etc. can be found at: *http://www.copernicus.org/egsagueug/index.html.*

Deadline for registration is March 7, 2003.

April 30-May 4 (Wednesday-Sunday) **Seismological Society of America Annual Meeting**, San Juan, Puerto Rico. This meeting commemorates the 100th Anniversary of the University of Puerto Rico along with 100 years of seismic instrumentation in Puerto Rico. More can be learned about the conference by visiting the Web site: *http://civil.uprm.edu/ssa-2003/.* This year's meeting also includes a special technical session:

Seismological Tools for the Advancement of Tsunami Modeling and Warning. The co-convenors are Professor Aurelio Mercado (amercado@uprm.edu) and Dr. Eric Geist (egeist@usgs.gov).

Advances in seismic instrumentation and source parameterization algorithms have had a significant impact on tsunami warning and hazard assessment capabilities. Improved accuracy of event location, focal depth, and magnitude information has had a direct effect on the accuracy of tsunami warning systems. The increase in the amount and availability of near-real time seismological information makes possible novel rapid tsunami models that can predict the severity and extent of a tsunami after an earthquake. In addition, the development of new earthquake hazard models can be used to forecast tsunami hazards from offshore fault zones. This session will cover a broad range of seismological applications toward the advancement of tsunami science, including emerging tsunami warning systems in the Caribbean and how seismological information can best be integrated with tsunami measurements and modeling.

The deadline for discounted pre-registration is April 4th. Online registration is available through April 23rd and can be accessed at *https://mail.seismosoc.org/ssa03_Reg/* . The venue for the meeting is the Caribe Hilton in Old San Juan (*http://www.caribhilton.com/*). The deadline for SSA reservations at the Hilton is March 29th.

UPCOMING CONFERENCES, *continued*

May 5-7 (Monday-Wednesday), **Public Safety and Risk Management Conference**. Fiji. (Outrigger Reef). Sponsored by SOPAC (South Pacific Applied Geoscience Commission). The purpose of the conference is the promotion of disaster reduction policy/legislation development, research, training, scientific knowledge and technology transfer to reduce community vulnerability from natural-, environmental-technological- and human- induced disasters. For more information visit *http://www.sopac.org.fj/Secretariat/Units/Dmu/Conference.html*, or contact: Vive Vuruyak;vive@sopac.org or Tel: 679 338 1377.

June 29-July 2, (Sunday-Wednesday), **PACON 2003**, Hotel Splendor Kaohsiung, Kaohsiung, Taiwan. Ocean Capital Year, The Sixth Regional Symposium of the Pacific Congress on Marine Science and Technology (PACON). PACON is an international, non-profit professional marine science an technology society dedicated to the sharing of scientific and technical information among those interested in the future of the world's oceans, with a Pacific focus. The technical sessions will revolve around 3 areas of concern: Ocean Science and Technology, Coastal Science and Technology, and Marine Resource Management and Development. Deadline for abstracts is March 31, 2003. Details are available at *http://www.hawaii.edu/pacon/*.

July 9-10 (Wednesday-Thursday) **JSS7 "Tsunamis: Their Science, Engineering and Hazard Mitigation,"** IASPEI-led inter-association symposium at **IUGG 2003** (30 June-11 July) Sapporo, Japan. A field trip to Okushiri Island will follow the symposium on July 11-13. Deadline for abstract submission was January 30, 2003. Lead convener for this symposium is Dr. Viacheslav (Slava) Gusiakov (gvk@OMZG.SSCC.RU) and co-conveners are Dr. Kenji Satake and Dr. Efim Pelinovsky. For more about IUGG 2003, visit: *http://www.jamstec.go.jp/jamstec-e/iugg/index.html*.

August 26-29 (Tuesday-Friday) **Krakatou Workshop** Arrangements are now being made for this workshop to held in Indonesia to commemorate the 120th anniversary of the eruption of Krakatou. The Meteorological and Geophysical Agency (MGA) heads the organizing committee. More information can be obtained by contacting Dr. Guhnawa Ibrahim, Director General of MGA (gunib@bmg.go.id) or Dr. Fauzi Rades, Coordinator of National Earthquake Center MGA (fauzi@bmg.go.id).

Located in Honolulu, the International Tsunami Information Center (ITIC) was established on November 12, 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 present 25 Member States are: 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, Samoa, Singapore, Thailand, the Russian Federation and the United States of America.

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