



Contents

Volume 9, Number 4 August 2007

<i>Special features</i>		<i>Departments</i>	
Opinion: Plea for effective emergency management	1	Hazard mitigation news	10
Tsunami evacuation drill, Samoa, California	3	Publications	13
Tsunamis on the North Coast of Papua New Guinea	4	Websites	15
Caribbean countries learn about tsunami warning system	8	Conferences/seminars/symposium	16
Artificial waves will put little "Seaside" to test	9	State Emergency Management offices	9
Book review	17	Material added to NTHMP Library	19
Stop Disasters game	17	IAQ	23
WSSPC awards in excellence	18	Video reservations	24
California town bans tsunamis	21	NTHMP Steering Group	21
Tsunami signs	22		

OPINION: Plea for effective emergency management

Kenya: A 'Tsunami' State Yet It Has Only One Working Kit

Posted to the web 19 July 2007; <http://allafrica.com/stories/200707190835.html>

By Kipkoech Tanui, *The Standard Managing Editor, Weekend Editions*
(Nairobi)

Reprinted with permission

The common denominator to the disasters that strike our country is that they always get us flatfooted. Our rapid-fire 10 tremors in seven days got the same reception as the August, 1998 terrorist bomb.

The fault lines are many - the Great Rift Valley is itself the home of many physical features that, though described as dormant volcanoes, are products of the violent natural phenomenon. They are offshoots of magma, 100 times hotter than the porridge that often scalds our throats, that melts rocks on its way. They include the spectacular Menengai and Longonot craters.

The swathes of black pumice rocks, which many of us who have no appointments with pedicurists use to scrap the ugly lumps on the sole of the feet, are evidence of the fire that, ages ago, swept through our land.

Listening to our authorities speak, there is no doubt we know what we are sitting on and what is in the neighbourhood. Lake Bogoria, the only hot-spring lake I know, could at another time be a source of sweeping hot rivers of death.

The rest of the Rift Valley, home to geysers and craters, is geographically a time bomb and the construction restrictions in Nakuru, the sinking town of Kenya, just symptomatic. Then the shocker: Our country, one of the global points of reference on underground and under-sea activity, and which is no stranger to tsunami, has only one working seismic waves monitoring and analysis machine.

The others, and they are only four, are dead. But as is predictable, we come to know of our low levels of preparedness when disaster knocks in the form of floods, mudslides, air and train crashes and buildings falling or catching fire.

The script is always the same: The Government Spokesman comes first, then Cabinet ministers take over. Down the line, the media are promised fire and brimstone for being part of the 'conspirators' fanning fear.

Though the Government would be telling you there is no need to panic, while also conceding earthquakes can't be predicted, it won't tell you its monitoring machines are dead. But the basic fact is that first, all, including the Government, thrive on the hope against hope that disaster won't strike. Second, that if it did, it won't be near us.

Third, the US and Israel are just hours away, the continuation of dependency on donor States. That is why the Government could only afford Sh15 million out of the half-a-billion needed to complete seismological centres. If it were

(continued on page 3)

TsuInfo Alert

is prepared by the Washington State Department of Natural Resources
on behalf of the National Tsunami Hazard Mitigation Program,
a State/Federal Partnership funded through the National Oceanic and Atmospheric Administration (NOAA).

It is assembled by
Lee Walkling, Librarian,
and is published bi-monthly by the
Washington Department of Natural Resources, Division of Geology and Earth Resources.

This publication is free upon request and is available in print (by surface mail),
and at <http://www.dnr.wa.gov/geology/tsuinfo/index.html>.
Participants in the TsuInfo program can request copies of reports listed in this issue from:

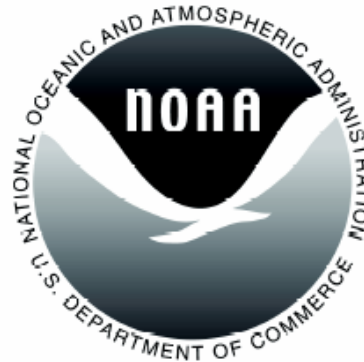
Washington Geology Library
Washington Department of Natural Resources
Division of Geology and Earth Resources
1111 Washington Street SE, MS 47007
Olympia, WA 98504-7007
360/902-1473
fax: 360/902-1785
e-mail: lee.walkling@dnr.wa.gov

The views expressed herein are those of the authors and not necessarily those of
NOAA, the Washington Department of Natural Resources, or other sponsors of
TsuInfo Alert.

ISSN 1938-5064



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands



(continued from page 1)

done on a phased out period, we would have had them working long ago.

But when disaster strikes, we wax lyrical and begin auditing our systems, processes, equipment and personnel, all the time denying that we are plugging holes we should no longer have.

After the terrorist bomb, Paradise Hotel blast and killer clashes and accidents, we still rely on the military and police. There is no specialised team - just a secretariat calling itself Disaster Management Centre, whose first call in case of an emergency is to St John Ambulance, Red Cross, Army and the police. That is probably why it was Internal Security minister Mr John Michuki who spoke, not the Information minister. Why was the Environment minister quiet yet tremors affect our flora and fauna? And the Minister for Health was also silent yet hospitals were waiting!

The point is this: We do not, as of now, have a strong public communication system that goes beyond Dr Alfred Mutua and his endless remonstrations. The joke at the beginning of his briefing that some journalist looked like he slept out because of the rumour that an earthquake was about to strike shows the trivia that he allows into such weighty and serious sessions in the name of making reporters relax.

We need a rescue and evacuation unit, and beside Mutua, its team leader should tell us what will be done if disaster strikes. We need personnel with distinct uniform and mandate. We also need a sensitisation programme for the public. But above all, Government agencies, those dealing with safety, quality and durability of buildings, must work between disasters. Relying on Japan and the US is farcical.

An audit of our buildings would be welcome and close monitoring of those coming up, particularly the ones dazzling with glassware, would be sweet news. Above all, we should equip our geologists because we have some of the best the world can offer. The equipment they use is not like wristwatches one can do without because the sun is, after all, up!

I was on the ninth floor of our offices when the mother of the nine tremors passed by at 5:10 pm on Tuesday. I still feel false tremors. This is no laughing matter! ♦

Tsunami evacuation drill planned for Samoa [California] residents

By Heather Muller, 6/25/2007

The Eureka Reporter

<http://www.eurekareporter.com/ArticleDisplay.aspx?ArticleID=25544>

Reprinted with permission

Samoa residents will practice heading for high ground during a tsunami evacuation drill Thursday [June 28] at 6 p.m. The exercise, coordinated by the Eureka office of the National Weather Service in conjunction with the Redwood Coast Tsunami Work Group, the Samoa Pacific Group and Danco Development, will give residents of and visitors to Samoa an opportunity to practice what they should do in the event a major tsunami bears down on the North Coast.

“We’re practicing for a Cascadia event, where residents don’t have time to leave town, so they’re leaving on foot,” said Troy Nicolini, warning coordination meteorologist for the National Weather Service.

Nicolini said residents will head for high ground in Samoa — in this case a 48-foot-high sand dune that has been designated as the evacuation site. “We’re going to do this drill to see if it works, to see if we can get the whole town to high ground in 10 or 15 minutes,” he said.

In a news release issued by the NWS, Nicolini stated, “If people know what to do during a tsunami, they will survive the tsunami. It’s one thing to read about what to do and to look at evacuation maps, but that is all hypothetical. This drill is as close as we can get to the real thing, so we think that it will make a lasting impression on the residents of Samoa.”

One impression Nicolini hopes residents come away with is that tsunamis are survivable if the appropriate actions are taken. “I hope people afterward feel better prepared and safer,” he said.

Humboldt State University geology professor Lori Dengler said the drill will be the first of its kind in California, and a professional film crew will be on hand to record the event for a tsunami documentary.

A secondary goal of the drill is to test the evacuation routes and the signs that are placed along the routes to guide people as they evacuate, the release stated. Temporary signs are being used so both the routes and the sign locations can be adjusted based on the results of the drill.

The planning of the drill was led by Nicolini, Dengler and by Mike Nelson of Danco Development. Danco President and CEO Dan Johnson stated he was pleased with the effort.

“The orchestration of this drill has been a collaborative effort between the private and public sector(s). We have been able to leverage the resources and talents of everyone involved to get results that would have been impossible without working together.”

The siren used for Thursday’s drill has a range that can vary significantly depending on weather conditions, the release stated. It may be possible to hear the siren within five miles of Samoa. The newly installed siren will sound at 6 p.m. sharp, and participants are asked to follow evacuation routes to the designated tsunami evacuation site. ♦

Tsunamis on the North Coast of Papua New Guinea

By Mary Mennis

The catastrophic Sissano tsunami of 1998 is only one of many tsunamis to have occurred along the north coast of Papua New Guinea. Whilst the accounts of western visitors and colonists only provide data on tsunamis since the 1870s, the oral traditions of Papua New Guinea record tsunamis that occurred as much as 500 years ago. Their oral traditions preserve both the memories of the tsunamis themselves and the knowledge of how to recognize the warning signs of tsunamis and how best to react in this type of emergency.

These oral traditions are comparable to the Native American traditions in the Pacific Northwest of a great earthquake and tsunami on a winter night several centuries ago. This was subsequently found by Kenji Satake in Japanese tsunami records to correspond to a tsunami that struck Japan on 27 January 1700 (Satake et al 1996: 246 to 249).

1. The story of Yomba Island

It could have been as long ago as 1600 that a devastating tsunami occurred on the north coast of Papua New Guinea when a large island, Yomba, sank into the sea. According to most oral traditions, Yomba Island stood at Hankow Reef, which is in line with the volcanic islands of Karkar, Long (also known as Arop Island) and Bagabag, and is nearly exposed at low tide. Satellite imagery shows Hankow Reef as a large circular reef indicating that it is the remnants of a volcanic cone, which could have once supported an island. Whether the volcanic island erupted and sank into itself or just sank after severe earthquakes is not known. Whatever happened, a large tsunami engulfed the adjoining coast at this time. Many people died in the ensuing chaos and others managed to escape to the coastline at various points.

There were varying oral traditions about the whereabouts of Yomba Island and the reason for its disappearance, although most informants did say that it was located at Hankow Reef. One thing they did agree upon was that the people from Yomba had already left the island and were living on the coast when the dust and ash from an eruption on Long Island occurred.

The people who lived on Yomba Island were Austronesian speakers, pot makers and high sea traders. The survivors started new colonies many kilometres apart along the coast of the mainland of Papua New Guinea to the south. Carrying on their traditions until recently, their villages are easily discernable, since the original people in the area were non-Austronesian speakers, leading to obvious linguistic differences. Visiting these villages in the 1970s, I was able to collect their oral traditions and was amazed at their similarity. They all trace their ancestry back to Yomba Island.

Some of the descendants of this Austronesian group went to live on Kranket Island, a small island off the coast

of Madang town. One of the first informants to be interviewed here was Madmai of the Yanupain Clan. Madmai's genealogy was ten generations deep, originating with Berma and Glomba two ancestors who escaped from Yomba before it erupted and sank.

Madmai of Kranket Island

Yomba was a big island with a volcano that erupted. It was as big as Karkar. It lay between Bagabag and Long Island where the reef called Hankow now is. There were big earthquakes and the volcano blew up. Then the island sank causing a large tsunami wave that covered the land and then went right out to sea. All the Madang Coast was inundated by this high water. Arop erupted a long time later. My ancestors had already left Yomba and were living on Kranket Island when the time of the darkness from Arop came. It was like rain or snow. There were two happenings. First was when Yomba Island erupted with a big noise and then there was Long Island, which erupted later. The names of our ancestors who escaped from Yomba were Berma and his wife, Glomba. Yomba was the origin of all the places. The people from Yomba came to the mainland and the island near Madang. The *bel* people from Yabob, Bilibil, Kranket etc are all from Yomba. Other people who escaped went to Mindiri, Karkar and Bagabag. When these people had lived on Yomba they all had the same language. Later, when they went to different places their language changed over the years (Interview, 7 July 1977).

Evidence from all the oral traditions show that Yomba sank at least two generations before Long Island erupted. As research by vulcanologist, Dr Russell Blong, dates the eruption on Long Island to be about 1670, this puts the tsunami associated with Yomba's disappearance at about 1600. Genealogies collected were generally only ten generations deep so this would mean a lot of telescoping of names has occurred. As genealogies are passed on orally from one generation to the next, the genealogy is at risk with the weakest link – the human memory. If they are kept constantly to a ten-person depth then names in the middle are omitted. However the people to whom these important events happened, Berma and Glomba who escaped the sinking volcano and experienced the tsunami, are remembered as being significant. This tsunami must have had a devastating effect on the islands to be remembered so definitely in their genealogical memories. It would be one of the oldest recorded oral tradition in Papua New Guinea.

Can we use genealogies to date happenings in the past? Many oral historians and anthropologists agree that genealogies can be changed. Vansina says, "genealogies are sources in which distortions are very prone to occur... Because of the functions they fulfil, they undergo many alterations, and are frequently telescoped" (Vansina, 1965:153). Telescoping occurs when insignificant ancestors are dropped from the genealogy.

2. Evidence of a Tsunami in the early 1800s on North Coast of Papua New Guinea, opposite Karkar Island

While in Madang, Papua New Guinea I was researching how much history could be hidden in Myths. I decided to investigate the local myth of two brothers, Kilibob and Manup. In doing this, I came across evidence of a tsunami in the early 1800's. These two mythical brothers were always fighting. After one fight at Budup, Kilibob built a ship there and sailed away promising to return while Manup only built a canoe. In 1976, I met Larnau, the Budup clan leader. When I asked him the location of the fight between the two brothers, Kilibob and Manup, he said without hesitation, "Come I'll show you!" (Interview, 1976).

We drove down the road and he directed us to Doylan where, Larnau assured me, the two brothers, Kilibob and Manup, built their ship and canoe. He indicated where there had been a large hole, now covered with thick undergrowth and tall trees. Pointing out two channels which ran down to the sea, Larnau said they were the original channels created by a large tsunami which had swept Kilibob's ship out to sea. Was it possible that there had been a tsunami in the past, which had become assimilated into the myth? This would explain why Kilibob and Manup had been credited with such magical qualities.

Subsequently, Father Noss, missionary of Halopa, told me that his people in the village on the mountain overlooking Budup had stories about a large sailing boat that was stranded by a tsunami. The boat had sails and was bigger than any boat they had ever seen – and the people on board were white.

Later I interviewed Franz Moeder of Madang. He told me he had visited Budup in the 1920s, with Father Hirsch, a missionary from Sek. In the hole itself (the one Larnau had pointed out to me) and in the surrounding villages, they found four steel daggers, two bronze statues of bronze legionaries and some ship fittings and even a wine stand. Franz Moeder drew a likeness of one of the statues and the sword and scabbard.

Franz had lived on Sek Island as a boy and remembered being visited by an old man, Ngangai, a local headman in the 1920s. Ngangai told him that, when his grandfather was a boy, he had seen a sailing ship at Budup about the 1830s. There is evidence of at least one visit to the Bismarck Sea by an American ship in the 1830s from the book written by one of the crew, Jacobs (1844); although his particular ship didn't meet with any mishaps. However, American whalers were sailing north of Papua New Guinea at this time, catching sperm whales in the western Pacific between Papua New Guinea and Guam, so it is possible that it was an American ship. In the light of this evidence, there is proof that an earlier sailing ship landed on the Madang coast sometime in the early 1800s, probably stranded by a large tsunami.

Whether these sailors were able to salvage their wrecked boat and make it seaworthy again is a matter of

conjecture. It was the first time the people had witnessed the possessions of a foreign people who promised to return bringing the good times.

Some myths are based on historical events and that of Kilibob and Manup is no different. When this foreign sailing boat suddenly appeared, it would have made a big impression on the people, and they assimilated it into this myth. It also led to the beginning of a cargo cult in the Madang area, since Kilibob promised to return to the area bring all the "cargo" for the people's benefit.

3. Tsunami at Bilibil Island, 1880s

In the 1880s there were two large eruptions in that area of the world. The first in 1882 was the Krakatau eruption in Indonesia when half the island sank into the sea, generating a series of pyroclastic flows and immense tsunamis that destroyed nearby coastlines. The effects of this eruption were noticed in Papua New Guinea but probably did not cause a major tsunami along that coastline because the sea wave would have been blocked by Australia and the islands of Eastern Indonesia. The other eruption occurred on 13th March 1888 when Ritter Island, near New Britain, erupted causing a tsunami. According to the German New Guinea Annual Records for 1888, the volcanic cone collapsed and most of the island disappeared into the sea causing a 12-15 metre tsunami with a resulting loss of life.

In the 1880s some people lived in their village on Bilbil Island on the north coast of Papua New Guinea. One day some men stayed on the island and others went across to the mainland to check the gardens. They were about to go back to the island when the earthquake struck. This was followed by a tsunami.

Some people were in canoes which were tossed back up on the beach by the large wave. The people were terrified and grabbed hold of trees and the bushes to steady themselves. Some of them probably drowned. One man who landed in the coconuts at this time was Gab from the Luan Clan on Bilbil. He had been standing on one of the large canoes out to sea when the tsunami smashed it high up against the coconuts. He grabbed hold of a tree and climbed up as fast as he could. When the sea receded Gab climbed down and ran off into the bush. Many fish were tossed up on the beach and the pigs came to eat them. When the tsunami had finished the men returned from the bush, collected a lot of the fish and took them back to the island. They were very amused to see Gab's canoe still in the top of the tree. Bilbil Island was not affected by the tsunami and the houses were not destroyed. Gab was a contemporary of Kain, a friend of Miklouho Maclay, the first foreign settler on Madang coast in 1871 (Interview, 12 March 1976).

Miklouho Maclay also reports a destructive local tsunami, perhaps connected to a coastal landslide that destroyed a village near the site of his camp at Garagassi some 15 years before his arrival in about 1855 or 1856.

(Sentinella, 1975: 236). Since the tsunami occurred at night most of the people in the village were caught unawares and killed. This tsunami occurred at night rather than the middle of the day as the one experienced by Gab, so the men were describing two different tsunamis.

4. Tsunami at Sapara Village, 1930

The Divine Word Missionaries established a mission at Sapara in the 1920s and a new church had just been completed. On Christmas Eve 1930, Fr Van Baar was making his way over to the church when he heard the excited cries of the people. Looking to the beach he saw the water had receded 500 metres leaving many fish stranded. People raced down to get the fish but turned to see an enormous wave coming. The cries went out, "Run Run". Fr Van Baar took off towards the hills. Up to his waist in water, he managed to hold on to some bushes. Looking back he saw that the force of the water had demolished the new church and his presbytery. In all thirty-two structures were destroyed by the tsunami on the mission station and nearby villages. Some people had been caught in buildings and badly cut and others were drowned. Nor was Sapara the only place affected. Ten other villages in the area were similarly devastated.

Only 12 people were killed by this tsunami, a remarkably low mortality rate given the size of the tsunami and the wide region affected. In most villages, people ran inland after seeing the sea recede at the beginning of the tsunami and were well on their way to the nearby hills and safety by the time the first flooding wave inundated the coast.

The same tsunami had been noticed in the Madang Harbour and at Alexishafen but, since both these places are protected by reefs and islands, no damage was done. News of the devastation at Sapara arrived at Mission Headquarters at Alexishafen the next day while the missionaries were sitting down to their Christmas dinner. They immediately sent the mission boat with supplies. Fr Ross said that, apart from the new church, the mission buildings were worth very little as they were mainly built of native materials, but the publicity of the tsunami in Europe and Australia resulted in many donations far and away more than the damage caused. Tsunamis have always attracted large donations (Mennis, 1982: 33).

5. Two tsunamis at Rabaul, New Britain, 1971

While living in Rabaul, we experienced two strong (strength 8) earthquakes within two weeks in July 1971. The first one occurred at 4 pm on 14 July. We were in the middle of purchasing items in the supermarket and the whole building shook convulsively and goods began to fall off the walls. We returned home but later went to the harbor front to see the second tsunami advance. The first wave had come 50 minutes after the earthquake and had carried some boats from the water to the other side of the harbour road. When we returned the water had receded

quite a long way out leaving boats normally in the water, now sitting on the seafloor. As we watched the water came back but it did not stop at the usual high-water mark but kept advancing across the road. We quickly shifted the car and watched as it crept forward. It was not in the form of a wave as the harbour was encircled by high volcanoes, protecting it from the open ocean. It was just a surge of water that kept coming past the normal water line across the grass and the road and on into the town. It set some cars floating and banging into each other in the car sales yard. The wharf was damaged a little.

The details of this strong earthquake and subsequent tsunami can be found on the internet. The first earthquake on 14 July 1971 was described as "a strong earthquake with a magnitude of 7.9 and occurred at a depth of 50 km in the Solomon Sea near New Britain. Damage was not significant in the town. The earthquakes caused two deaths". The time of the earthquake was 4pm and the first of the tsunamis reached the town 50 minutes later. The maximum wave height observed was 2 metres. Most of the damage was caused when water entered buildings including shops, offices and houses.

The next earthquake was on 26 July 1971 at about 11.30 am. My husband Brian and I were at the Rabaul airport and the plane was delayed because of the severity of the quake. We could see across the bay to the Kokopo Road where the cliffside was falling onto the road obliterating about 40 metres of it. Later we heard that two motorists on the road saw the landslide in their rear vision mirror. They missed being killed by seconds. The tsunami came about half an hour later, just on noon. The main road, Mango Avenue, was awash and the main store had a several feet of water in their showrooms.

"This earthquake produced a tsunami which was more destructive than the previous one. The maximum wave was estimated at 5 – 6 metres. The period was 30 minutes during which major flooding occurred and damage to boats and building was recorded." (Internet)

6. Tsunami near Aitape on the North-West coast of Papua New Guinea, 1998

In the Aitape area, the villages of Malol, Arop, Warapu and Sissano are strung out along the coast and the Sissano Lagoon. Living there so close to the sea was an idyllic location and provided a healthy environment for a community of 12,000 people who fished and gardened. The village houses were right on the beach, a favourite playground of the young children. There were nearby schools and health centres and the Sissano Church of the Aitape Catholic Mission.

Earlier inhabitants of the sandspit between the sea and Sissano had abandoned it after an earthquake and subsidence in 1907. The people who were there in 1998 were immigrants from upstream on the Sepik River and so unaware of the tsunami hazard along the coast--hence

their decision to settle in a place that was especially vulnerable to tsunamis

On Friday, 17 July 1998, as the older students were returning the next day to their various boarding schools, they decided to have a party on the beach. A strength 7 earthquake disturbed their revelry but after the ground stopped shaking they continued with their preparations for the feast. Just after 7pm they noticed the sea had receded out from the shore and some went to have a look.

Suddenly far out to sea they could see a wall of water rushing towards them. Hastily they ran from the beach as fast as they could and headed inland. But the area is quite level with no nearby hillside to escape to and the 10 to 15 metre wave soon caught them as it swept all before it. More than 2,100 villagers died as the huge wave tore into trees, houses and other buildings with a tremendous force, sweeping all into the lagoon. The old Sissano Church was destroyed. Lumbering logs and sharp poles killed people and their bodies were swept three kilometres away into the mangrove swamps or back out to sea.

Just before it happened, fishermen returning to the beach in their canoes saw the sea recede and then saw a wave developing. Calling and shouting for everyone to run they were caught by the wave which broke some distance out to sea and approached rapidly, rose to tree-top height and then crashed down on their villages. Some fishermen rode their canoes in the wave and were carried far inland and catching hold of trees to save themselves. Half an hour later the destruction had ceased but people began wailing and crying as they looked for their lost children. Others hurt in the destruction called for help. It was now pitch dark with no moon or stars.

One missionary said;

The tsunami raced towards the shore at 35 km per hour in three waves. Twenty minutes after the quake a towering tsunami loomed out of the gloaming with the roar of a jet plane just as the people were preparing a meal and planning entertainment for the evening. There was no warning of the devastation that was seconds away. The first wave exposed the sea floor and some children and adults went closer to see. The second wave rode in on the back of the first and broke right in the middle of the villages. A third lesser wave followed. Then the waters rushed back to the ocean in multiple streams carrying bodies out to sea. The people fled in terror, carrying the injured and burying some on the way to higher ground and distant villages. The small streams leading away from the lagoon were clogged with people walking or pushing canoes in the dark, expecting another wave to overwhelm them at any moment. The

tragedy was that no one in Aitape realised the full extent of the damage and loss of life until early next morning when word came through from travellers and by radio.

(Internet)

Following the event, much was learned about the tsunami from survivors:

In particular, survivor stories about the timing of the arrival of the wave were a factor in persuading most investigators that the wave was caused by movement of sediments after the earthquake, rather than by co-seismic rupture on a fault. Fishermen had witnessed the escape of gas from the sea floor before the earthquake, and survivors told of a kerosene or oily smell in the wave. Their stories reinforce the possibility that a sudden release of natural gas was in some way linked to the development of the tsunami. The escape of a large volume of gas could explain the otherwise puzzling observation by most survivors that the water in the wave was unusually warm. Escape of gas in the eastern Mediterranean is known to have raised the temperature of seawater by as much as 60c. Eyewitnesses also provided useful information about the shape of the wave, how it had come ashore first at a point on the coast at or near Mak, and had progressed westward along the coast. (Internet)

After the Aitape tsunami people found it difficult to view the sea again in the same way. They had always trusted it to protect them in the good seasons and give them a bountiful harvest of fish. Many who survived the tsunami were terrified to go near the water. It was post-traumatic stress disorder, which the people would suffer for years afterwards. Many village people shifted their houses inland and the fishermen were reluctant to put their canoes to sea again to go fishing. Who might know if it would all happen again? Within a year, though, things seemed to be going back to normal and a few hardy people began to rebuild their village houses close to the coast again. But many are still haunted by the memories and the loved ones lost. In the aftermath of the tsunami donations arrived from all over the world.

Finally

It can be seen from the above observations that, over hundreds of years, many tsunamis have hit the north coast of Papua New Guinea. Whether caused by eruptions, earthquakes or land subsidence, they have the same devastating effects on people and places. Earth scientists are researching many facets of these destructive waves, eruptions, island movements etc and this research is ongoing.

Bibliography

Blong, R., 1975. The Krakatoa Myth and the New Guinea Highlands. *Journal of the Polynesian Society* 84 (2).
Mennis, M. R., 1978. The existence of Yomba Island near Madang Fact or Fiction, *Oral History*. Institute of Papua New Guinea Studies, vi (6)

Mennis, M. R., 1980. Oral Testimonies from Coastal Madang, Part 1, *Oral History*, Institute of Papua New Guinea Studies, viii. (10): 1-118.

Mennis, M. R., 1981. Oral Testimonies from Coastal Madang, Part 2, *Oral History*, Institute of Papua New Guinea Studies, ix (1): 1-106.

Mennis, M. R., 1981. Oral Testimonies from Coastal Madang, Part 3, *Oral History*, Institute of Papua New Guinea Studies, Vol IX Number 2 1981.

Mennis, M. R., 1982. *Hagen Saga*. Institute of Papua New Guinea Studies, Port Moresby.

Mennis, M. R., 2003. *Ferdy. The Story of Father Ferdinand Parer*. Lalong Enterprises, Brisbane.

Mennis, M. R., 2005. *Yomba Island, Atlantis on the South Pacific*. Unpublished Paper

Mennis, M. R., 2006. *A Potted History of Madang*. Lalong Enterprises, Brisbane.

Satake, K., Shimazaki, K., Tsuji, Y. & Ueda, K., 1996. *Nature*, volume 379.

Sentinella, C. L., 1975. *Mikloucho-Maclay: New Guinea Diaries 1871 ~ 1883* translated from the Russian by C. L. Sentinella, Kristen Pres, Madang.

Vansina, J., 1965. *Oral Tradition: A Study in Historical Methodology*. Penguin.

The Author

Mary Mennis collected oral traditions of the people along the North Coast of Papua New Guinea in the 1970s. Initially interested in the material culture of the people, she continually heard about the origins of the Austro-nesian speakers in the Madang area. They said they brought their material culture with them from Yomba Island some twelve generations earlier. Mary has a Masters Degree in Oral History from the University of Papua New Guinea and another in Social Science from James Cook University, Queensland. Last year, she published "A Potted History of Madang" which covers her research in the Madang area.

Acknowledgements

In writing this article, the author would like to thank Dr Simon Day of the University of California, Santa Cruz, for his help and comments. ♦

Caribbean countries learn more about tsunami warning system

By Stephen Cummings
 Caribbean Net News Trinidad and Tobago Correspondent
 Published on July 7, 2007
<http://www.caribbeannetnews.com/news-2425--17-17--.html>

Reprinted with permission

PORT-OF-SPAIN, Trinidad: Over forty participants from more than twenty countries in the Caribbean and Latin American region convened on the Trinidad St Au-

gustine campus of The University of the West Indies for a six-day Caribbean Training Course in Seismology and Tsunami Warnings.

The programme ran from June 25-30, 2007. Hosted by the UWI's Seismic Research Unit, the Course was part of an ongoing regional effort to establish a tsunami warning system for the Caribbean and adjacent areas.

It provided participants with an understanding of the science behind tsunami warnings and exposed them to operational best-practices of warning centres.

The Caribbean continues to be vulnerable to natural disasters such as tsunamis and major earthquakes and "as the regional centre of research, the UWI (therefore) has an obligation to improve regional capacity."

This, according to the UWI, St Augustine Campus Principal, Dr Bhoendradatt Tewarie. Dr Tewarie's statement was part of the welcome remarks delivered by the Principal during the opening of the course.

"There is no doubt that this region must adopt proactive programmes to minimize the damage that tsunamis and other coastal hazards can cause. The first steps that must be undertaken are those that this workshop is adopting, viz., improved co-operation and the implementation of regional and international initiatives to increase their ability to respond to such events," Tewarie was quoted as saying.

Coming from varying backgrounds of emergency planning, meteorology, and seismology, course participants engaged in wide ranging discussions on tsunamis as well as other hazards and discussed how best to develop a tsunami early warning system that enhanced mitigation against such hazards.

Running concurrently with the Seismology & Tsunami Warnings Training Course was a training programme for seismic technicians in the use of EARTH-WORM, a seismic data processing package used in managing real-time seismic data streams.

The Seismology & Tsunami Warnings Training Course was developed in collaboration with the United States Geological Survey (USGS), the Puerto Rico Seismic Network (PRSN), and the UNESCO IOC International Tsunami Information Center (ITIC).

This was one of several activities being coordinated by the Seismic Research Unit towards the establishment of a Caribbean tsunami warning system.

Funding for the course was provided primarily by the USAID/OFDA with additional financial support from the United Nations Development Programme (UNDP) and the UWI Centre for Disaster Management and Risk Reduction. ♦

Artificial waves will put little 'Seaside' to test

Tsunamis - OSU researchers are ready to simulate waves from Northwest quakes

Wednesday, July 18, 2007

RICHARD L. HILL

The Oregonian Staff

<http://wave.oregonstate.edu/news/story/2164>

Reprinted with permission

Towering over a miniature "Seaside" like game-playing giants, the Oregon State University students carefully position yellow houses, red businesses and blue hotels along a shoreline.

But this isn't a game. The students are preparing the scale-model city -- a partial replica of the popular Oregon beach community -- to be clobbered by artificial tsunamis. Their goal: give planners a better of idea of how a real tsunami would act if it struck the coast.

The students are part of a research team at OSU's Hinsdale Wave Research Laboratory that will be studying how tsunamis of various sizes would sweep through Seaside.

"It's a simplified model of the waterfront area and the bathymetry offshore," said Melora Park, a tsunami researcher at the high-tech wave laboratory. "The main interest is looking at the path of the tsunami. How is the wave going to channel through the city?"

The hotels resemble those in Seaside: Many residents may be able to escape the tsunami by going to higher floors in hotels and other buildings rather than trying to flee the city.

Daniel Cox, director of the wave lab, said the first phase of the project this fall will measure inundation patterns, while a second phase will take measurements of flow depth and speed. Cox said several waves will be generated in the 50-yard-long Tsunami Wave Basin, the world's largest tsunami lab, which was completed four years ago.

The biggest wave would simulate conditions produced by a 30-foot-high tsunami that scientists think could be generated by a magnitude 9 earthquake off the Northwest coast in the Cascadia Subduction Zone. The zone, where two tectonic plates converge, is nearly geologically identical to the area off Indonesia that caused an earthquake and tsunami in 2004 that killed more than 200,000 people.

Evidence indicates that subduction-zone quakes have occurred frequently off Oregon, with the last one striking in January 1700. Scientists say another one is inevitable.

Many Seaside residents recall the tsunami that swept through the city in 1964, the result of a magnitude 9.2 subduction-zone earthquake off Alaska. The "Good Friday Quake" triggered a tsunami that moved south toward Oregon and California, sweeping four children who were camping with their parents to their deaths at Beverly Beach north of Newport and causing significant damage

at Seaside, Newport and other Oregon coast communities. It killed 11 people in Crescent City, Calif.

"We're watching this OSU project with a great deal of interest," said Deborah Treusdell, tsunami preparedness coordinator for Seaside. "The more we can learn about how tsunamis would affect our city, the better prepared we can be." ♦

STATE EMERGENCY MANAGEMENT OFFICES

updated 3-31-2006

Alaska Dept of Military & Veteran Affairs
Division of Homeland Security & Emergency Mgmt.
PO Box 5750
Fort Richardson, AK 99505-5750
(907) 428-7000; toll-free 800-478-2337
Fax (907) 428-7009
<http://www.ak-prepared.com/>

California Office of Emergency Services
3650 Schriever Ave.
Mather, CA 95655
(916) 845-8510; Fax (916) 845-8910
<http://www.oes.ca.gov/>

Hawaii State Civil Defense, Dept. of Defense
3949 Diamond Head Road
Honolulu, HI 96816-4495
(808) 733-4300; Fax (808) 733-4287
<http://www.scd.state.hi.us>

Oregon Division of Emergency Management
PO Box 14370
Salem, OR 97309-50620
(503) 378-2911; Fax (503) 373-7833
<http://www.oregon.gov/OOHS/OEM/>

Washington State Military Dept.
Emergency Management Division
Camp Murray, WA 98430-5122
(253) 512-7067; Fax (253) 512-7207
<http://emd.wa.gov>

Provincial Emergency Program
455 Boleskin Road
Victoria, BC V8Z 1E7 Canada
(250) 952-4913; Fax (250) 952-4888
<http://www.pep.bc.ca/>

NEWS

TsuInfo Alert has an ISSN!

TsuInfo Alert newsletter received official notification on June 8, 2007 that it had been granted an ISSN, International Standard Serial Number. A single ISSN uniquely identifies a title regardless of language or country in which published, without the burden of a complex bibliographic description. The ISSN itself has no significance other than the unique identification of a serial. The number will be included with the official data on page 2 of each issue. *TsuInfo Alert*'s ISSN is 1938-5064.

FEMA to replace Red Cross as coordinator of disaster aid provisions

The Federal Emergency Management Agency (FEMA) will replace the American Red Cross in administering the coordination of aid to disaster victims, an article in *The Washington Post* reported. According to David Garrett, FEMA's acting director of recovery, the Red Cross was the only private organization assigned a lead role in the National Response Plan. However, federal officials are currently revising this plan, and the Red Cross would be unable to carry out the duties assigned in a new version, Garrett told *The Washington Post*. FEMA's new role as administrator will not affect the Red Cross's traditional disaster relief operations (i.e., opening shelters, providing food, and raising money). The change in leadership comes after a June 2006 Government Accountability Office report stated that FEMA and the Red Cross had trouble coordinating aid for the millions of 2005 Gulf Coast storm victim.

From: Natural Hazards Observer, v. XXXI, no. 6, p. 8.
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

Underwater volcano seismically outfitted

An undersea volcano named Kick 'em Jenny has been fitted with a seismic monitoring device that will allow researchers to track the Caribbean volcano's rumblings in real time. The technology is designed to help researchers predict volcanic eruptions and tsunamis.

National Science Foundation press release, May 10, 2007

Angry Aceh residents disable tsunami warning system

According to a report dated June 11, 2007, angry Aceh residents disabled a tsunami warning system after a false alarm spread panic in the area hard hit by the 2004 Indian Ocean tsunami. A malfunction caused the siren to sound for about 30 minutes. The residents cut power to the siren but did not damage the equipment.

From: l'express.mu 11 June 2007

Sea gypsies saw signs in the waves

The sea gypsies of the Andaman Sea, the Moken, suffered no casualties in the December 2004 tsunami. Since they live 6 months of the year on their boats, they know the sea. They also have an oral legend about Laboon, "the wave that eats people." It's a legend recited around campfires, bearing an astonishing resemblance to what actually happened on Dec. 26, 2004.

To read the full story, go to
<http://www.cbsnews.com/stories/2005/03/18/60minutes/main681558.shtml>

FEMA Announces Membership of National Advisory Council

The Federal Emergency Management Agency (FEMA) has announced the 30-person membership of its newly formed National Advisory Council. According to FEMA, the council advises Administrator David Paulison on "all aspects of preparedness and emergency management in an effort to ensure close coordination with its partners across the country." The Post-Katrina Emergency Management Reform Act of 2006 called for the creation of this council, whose members are appointed by the FEMA administrator and "represent a geographic and significant cross section of officials from emergency management and law enforcement."

Members include homeland security directors; adjutants general; emergency response providers from state, local, and tribal governments; and private sector and non-governmental organization representatives.

The council will focus its attention on the development and revision of the national preparedness goal, the national preparedness system, the National Incident Management System, the National Response Plan, and other related plans and strategies.

The list of members can be found at
www.fema.gov/news/newsrelease.fema?id=37154.

From: Disaster Research, June 28, 2007, p. 2

Port Angeles, Washington, gets tsunami warning siren

On June 19, 2007, a tsunami warning siren was installed on the Port Angeles waterfront, on top of a 40-foot tower. The device is also capable of delivering a voice message. Similar warning sirens are already in place in Neah Bay and LaPush. According to Bob Martin, manager of the Clallam County Emergency Management Division, new sirens will also be installed this summer near the Lower Elwha tribal center, in the Dungeness Valley and at Clallam Bay.

For the full article:
<http://www.peninsuladailynews.com/apps/pbcs.dll/article?AID=/20070620/NEWS/706200302&SearchID=73288754684247>

Call for Papers: Performance under Stress: Managing Emergencies and Disasters

Journal editors are seeking manuscripts for a symposium on "Performance under Stress: Managing Emergencies and Disasters," to be published in the *Public Performance and Management Review*.

This symposium will focus on performance in dealing with disasters, including catastrophic disasters. Catastrophic disasters are characterized by unexpected or unusual size, disruptions to the communication and decision making capabilities of the emergency response system, and an initial breakdown in coordination and communication. High performance in dealing with disasters requires an ability to assess and adapt capacity rapidly, restore or enhance disrupted or inadequate communications, utilize uncharacteristically flexible decision-making, and expand coordination and trust of emergency response agencies.

Editors are soliciting articles that analyze a range of issues related to performance management in managing disasters, such as the meaning of responsiveness in managing disaster networks, efficiency and timeliness, the factors that affect public organizations' level of responsiveness, and best practices of improving disaster management performance.

The deadline for manuscript submission is September 30, 2007.

All submissions will be refereed. Please send manuscripts or proposals for manuscripts to nkapucu@mail.ucf.edu. The mailing address is: Dr. Naim Kapucu, Department of Public Administration, HPA II 238M, University of Central Florida, Orlando, FL, 32816.

From: Disaster Research, June 28, 2007, p. 3

Petition to Support a New American Planning Association (APA) Division "Planning for Natural Hazards"

At the recent American Planning Association National Conference in Philadelphia, Pennsylvania, a steering committee of approximately 22 planners, voted to form a "Planning for Natural Hazards Division." The steering committee felt that recent disasters have helped to elevate the importance of planning for natural hazards, and that it is important to coordinate hazard planning on a local, regional, state, and federal level.

If the new division is approved by the American Planning Association Board, the division will:

1) Facilitate communications between natural hazard planners at all levels of government and in the private sector

2) Guarantee natural hazard planning sessions at the Annual APA Conference

3) Strengthen relationships with other divisions in APA

4) Give a venue to facilitate additional training opportunities for members in this fast-changing specialty

5) Assist the APA with the development of legislation and policy positions and a research agenda related to natural hazard planning issues

6) Stimulate and contribute to the improvement and recognition of planning for natural hazards as a viable process in all areas of government

7) Encourage continuing professional development of members through opportunities provided by APA

8) Provide for the input of experienced professional planners into federal policy regarding mitigation and recovery planning

The steering committee needs 100 original signatures from APA members around the nation to get the APA to consider the formation of this division.

A copy of the petition is available at <http://disasterjunkiesunite.blogspot.com>.

From: Disaster Research 480, June 14, 2007, p. 4

Call for Presentations: Partners in Emergency Preparedness Conference

Researchers, scholars, and practitioners in emergency management are invited to participate in the Partners in Emergency Preparedness Conference to be held at the Greater Tacoma Convention & Trade Center in Tacoma, Washington, on April 1-2, 2008.

Partners in Emergency Preparedness has conducted a very successful regional conference each spring for over ten years. The conference has grown into the largest emergency management conference in the Pacific Northwest, bringing together non-profit organizations, public agencies, business and industry, military, healthcare, and schools to explore emergency management issues, principles, and practices. The theme for the 2008 conference is "It's a different world: Looking to the future." The Conference Steering Committee is particularly interested in presentations focused on business disaster preparedness and on translating disaster-related research into information useful to practitioners. Presentation sessions are generally 75 minutes in length; a limited number of double sessions may be available.

If you are interested in making a presentation at the 2008 conference, please provide an abstract, proposal, or brief description of your topic no later than September 1, 2007, to: Sarah Miller, Curriculum Committee Chair, Partners in Emergency Preparedness Conference, PartnersCurriculum@gmail.com

(206) 222-1923

From: Disaster Research 480, June 14, 2007, p. 4

USGS teams with commercial satellite imagery companies to support "Space and Disasters"

Two U.S. commercial satellite imagery firms have teamed up with the U.S. Geological Survey (USGS) in support of the International Charter, "Space and Major Disasters." The charter works to provide emergency response satellite data free of charge to those affected by

disasters anywhere in the world. DigitalGlobe, headquartered in Longmont, Colorado, and GeoEye, based in Dulles, Virginia, are remote sensing companies renowned for acquiring and delivering map-accurate, high-resolution satellite imagery using state-of-the-art Earth-imaging technology. The USGS will act as the interface between GeoEye and DigitalGlobe and International Charter operations to advance the goal of getting imagery for disaster response into the hands of the people who need it.

Many satellites capture images at relatively moderate resolutions, making them useful for large-area applications, but precise, smaller-scale analysis of a disaster's impact, such as assessing damage to buildings and infrastructure following an earthquake, requires a more detailed view. DigitalGlobe's QUICKBIRD and GeoEye's IKONOS satellites capture panchromatic images with a resolution of one meter or less. While there is normally a cost associated with obtaining high-resolution commercial satellite images, the two companies have agreed to donate some archived imagery and also provide newly tasked imagery at a reduced cost to the USGS and the International Charter. First responders and end users of the Charter's system will then have access to these data.

From: Natural Hazards Observer, v. XXXI, no. 6, p. 7.
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

New radar satellite offers promising disaster management applications

A new Canadian satellite will soon provide the most advanced, commercially available Synthetic Aperture Radar (SAR) imagery in the world. RADARSAT-2 is Canada's next-generation commercial SAR satellite and represents a collaboration between the Canadian Space Agency and MacDonald, Dettwiler and Associates Ltd. (MDA).

Because of their ability to collect imagery even in darkness or inclement atmospheric conditions, SAR satellites are excellent resources for operational use in a variety of disaster management scenarios. RADARSAT-1 data have been used effectively in the management of disasters such as floods and oil spills. The capability to deliver data in near-real time has been essential for relief agencies that require timely data for monitoring and mapping damage, as well as for assessing the impact on future planning.

As the follow-on to RADARSAT-1, launched in 1995, the new satellite will be launched in the summer of 2007 from Russia's Baikonur Cosmodrome in Kazakhstan. RADARSAT-2's new design features powerful technical advancements, including high-resolution imaging, flexibility in selection of polarization, left-and right-looking imaging options, superior data storage, and more precise measurements of spacecraft position and attitude.

For more information on the satellite's applications to disaster management, including links to case studies, visit the RADARSAT-2 Web site at www.radarsat2.info.

From: Natural Hazards Observer, v. XXXI, no. 6, p. 10.
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

Indonesia expands tsunami warning system

According to a June 9, 2007 report, 90 early warning systems were installed in Java's southern coastal areas and Sumatera, including 7 weather radars in Jakarta, Medan, Surabaya, and Palembang. There are plans to install 70 more tsunami detecting devices by 2008.

From: <http://www.bernama.com.my/bernama/v3/news.php?id=266606>

For a full report on the new Jakarta tsunami warning center, visit <http://the.honoluluadvertiser.com/article/2007/Jun/12/br/br4359816207.html>

High stakes in California hazard plan update

The California Governor's Office of Emergency Services (OES) is in the process of updating the State Hazard Mitigation Plan (SHMP) approved by FEMA in October 2004. The SHMP is the official statement of California's hazard identification, vulnerability analysis, and hazard mitigation strategy and priorities. The plan must be updated and approved by FEMA every three years, with a 2007 deadline of October 8.

Under the federal Stafford Act, states must adopt SHMPs, and local agencies must have a Local Hazard Mitigation Plan (LMHP) to be eligible for disaster assistance and mitigation funding. Following a disaster, agencies can apply for a variety of hazard mitigation grants for a wide range of actions.

OES intends to submit an "enhanced" version of the SHMP to qualify California for additional federal hazard mitigation grant funds after future disasters. The stakes are high in preparing an enhanced plan, in contrast with simply updating the current "standard" plan. An enhanced plan would make the state eligible for up to 20% of total authorized Stafford Act assistance after a federally declared disaster. For a \$35 billion authorization, an enhanced SHMP could qualify California for up to \$7 billion, compared to \$26 billion under the standard plan.

The updated plan will place added emphasis on hazards such as climate change, levee failure, and tsunamis, in addition to addressing flood, seismic, wildfire, and other hazards. To achieve enhanced status, the plan must demonstrate a strong commitment to hazard mitigation, capability to manage and implement hazard mitigation projects effectively, and integration of local mitigation planning with statewide efforts.

The current plan can be viewed at <http://hazardmitigation.oes.ca.gov/>.

From: *EERI Newsletter*, v. 41, no. 4, p. 4.

Grant for: Modeling tsunami effects on mangrove ecosystems and the role they play in saving lives and properties

Soe Win Myint, Arizona State University, has been granted \$49,997 by the National Science Foundation for an 18-month study of the value of mangrove forests in mitigating the effects of tsunamis.

“Some observers have posited that mangrove forests act as a bio-shield to protect people and property from natural disasters, such as tsunamis and hurricanes. The loss and degradation of mangroves may make coastal regions more vulnerable to tsunamis and hurricanes, thereby leading to the loss of hundreds of thousands of lives and billions of dollars in property. When the highly destructive Indian Ocean tsunami hit India’s southern state of Tamil Nadu in December 2004, some areas with dense mangroves suffered fewer human casualties and less damage than areas without mangroves. Loss of coastal vegetation along the Mississippi Delta may have also contributed to the enormous devastation caused by Hurricane Katrina in 2005. Although many scientists have emphasized the importance and role of mangrove forests in saving lives and property, only sparse data exist to support this claim, and the protective function of mangroves has never been scientifically and systematically investigated. The investigators will conduct field surveys in tsunami-hit areas in South and Southeast Asia and collect remotely sensed data and other ancillary data. The assessment techniques, indices, or composites developed in the proposed plan will have a significant impact on disaster management and planning, because all hazard mitigation, planning, and preparedness programs need to be with an estimate of the number of people and structures that would be affected by a disaster event.”

From: *Natural Hazards Observer*, v. XXXI, no. 6, p. 14-15
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

IOC Tsunami Co-ordination Unit

The IOC Tsunami Co-ordination Unit (TCU) was established in June 2006 in order to assist the development of tsunami warning and mitigation systems globally. Until this time, the IOC Executive Secretary, the ITIC Director and the Senior Tsunami Advisor, supported by experts from PTWS and JMA, provided leadership and expert services to all Member States. The Tsunami Co-ordination Unit is located in the UNESCO headquarters in Paris, France. The International Tsunami Information Centre (ITIC) in Hawaii, USA, serves as the ICG/PTWS Secretariat and provides tsunami capacity building support both to the PTWS and globally. The ICG/IOTWS Secretariat is located in Perth, Australia. From February through July 2005, Dr. Francois Schindele, then ITSU Chair, was seconded to the IOC as a technical expert.

The Tsunami Co-ordination Unit receives extra-budgetary support from Australia, Germany, Ireland, Japan, Norway and the United States.

From: *Tsunami Newsletter*, v. 38, no. 4, p. 9.

Scientists build unique tsunami generator

LONDON, July 2 (UPI) -- British scientists are designing a machine capable of creating tsunamis in a controlled environment to study their effects on buildings and coastlines.

Full story is available online:

<http://www.sciencedaily.com/upi/index.php?feed=Science&article=UPI-1-20070702-14524600-bc-britain-tsunami.xml>

Tsunami-proof house comes up in Poovar

Engineer/builder/commercial sea pilot Mark Reynolds has built a house he claims to be tsunami-proof. See photo and read entire story at:

<http://www.newindpress.com/NewsItems.asp?ID=IEO20070604010030&Page=O&Title=Thiruvananthapuram&To pic=0>

PUBLICATIONS

EQ (Earthquake Quarterly)

The Winter 2007 issue

(<http://www.wsspc.org/Publications/news/EQ2007Winter.pdf>) includes the WSSPC member agency reports from the coastal states which contain updates on the states’ tsunami programs and activities. Alaska, p. 4-5; California, p. 9, 12; Hawaii, p. 12-13; Oregon, p. 14-15; Washington, p. 15-17.

Disaster Research

Owner-hazards@lists.colorado.edu for the email version. If you prefer to read the DR on the Web: <http://www.colorado.edu/hazards/dr/currentdr.html>

Disaster Medicine and Public Health Preparedness

See website below.

Journal of Earthquake and Tsunami (JET)

A new regular publication, the Journal of Earthquake and Tsunami (JET), provides a forum for scientists and engineers working in the areas of earthquakes and tsunamis. JET accepts original papers describing state-of-the-art research and development in pertinent areas of geology, seismology, ground motion, site and building response, tsunami generation, propagation, damage and mitigation, education and risk management. The journal’s editors are Muneo Hori of University of Tokyo (hori@eri.u-tokyo.ac.jp) and Lee Fook Hou of National University of Singapore (cveleefh@nus.edu.sg). http://www.worldscinet.com/jet/mkt/aims_scope.shtml

Volume one, issue one is online:
<http://www.worldscinet.com/jet/01/0101/S17934311070101.html>

The articles:

The Sunda megathrust—Past, present and future, by Kerry Sieh;
The Sumatran fault zone—From source to hazard, by D. H. Natawidjaja and Wahyu Triyoso;
Seismic shaking in Singapore due to past Sumatran earthquakes, by Tso-Chien Pan, Kusnowidjaja Megawati and C. L. Lim;
Vulnerability of buildings to long distance earthquakes from Sumatra, by T. Balendra, Z. J. Li, K. H. Tan, and C. G. Koh; and
Tsunami propagation modeling and forecasting for early warning system, by Pavel Tkalich, My Ha Dao, and Eng Soon Chan

From: *Seismological Research Letters*, v. 78, no. 2, p. 209

Natural Hazards Observer

Volume 31, no. 6, July 2007 is available online:
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

Disaster Management Canada

Volume 1, number 1 is available FREE online, www.ccep.ca/dmconv1i1.pdf (they are one's, NOT L's).

The inaugural issue of the official magazine of the Canadian Centre for Emergency Preparedness presents articles on all aspects of emergency management in Canada, including an update on tsunami warning systems and information on business continuity and insurance. The magazine, which replaces *Emergency Management Canada*, is published quarterly and is available in hard copy and online.

From: *Natural Hazards Observer*, v. XXXI, no. 6, p. 16.
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

Journal of Disaster Research

The new bimonthly journal began publication in August 2006. It aims to provide information on disaster (natural and man-made) prevention and mitigation and has a multidisciplinary, comprehensive scope. Technical papers as well as contributions on disaster prevention planning and measures, disaster (risk) management, disaster psychology, disaster-related medical treatment, sociological aspects of disaster, economic influences, and disaster philosophy are welcomed. In addition to papers, the journal will accept reviews, survey reports, letters, notes, discussions, and tutorials.

For more information: <http://www.fujipress.jp/DDR/>. Annual subscriptions cost \$839 for institutions and \$252 for individuals.

Emergency Management—Concepts and Strategies for Effective Programs

By Lucien G. Canton, 2007, 349 p. ISBN 0-471-73487-X, John Wiley & Sons, Inc. Drawing on social science and new national standards for emergency management programs, this book takes an all-hazards, multidisciplinary approach to emergency management. The text begins with historical and social science perspectives and then delves into the evolving roles of the emergency manager. It also explores the individual components of an effective emergency management program, including assessing risk, developing strategies, planning concepts, coordinating response, and managing crisis.

From: *Natural Hazards Observer*, v. XXXI, no. 6, p. 16.
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

Topics Geo Natural Catastrophes 2006—Analyses, Assessment, Positions

By Munich Re Group, 2007, 50 pages, free online: www.munichre.com/publications/302-05217_en.pdf. For the past 13 years, the Munich Re Group has presented the results of its annual worldwide survey of natural catastrophes in the Topics Geo series. Long-standing readers will notice that the approach is different for 2006. The new format, beginning with the subtitle—Analyses, Assessment, Positions—reflects this change of emphasis. Instead of constituting a statistical study of natural catastrophes, the focus is now on providing background analyses that are of practical application. Topics covered for the year 2006 include the relatively calm Atlantic hurricane season, the Northwest Pacific typhoon season, the July 17 tsunami in Java, and the Yogyakarta earthquake.

From: *Natural Hazards Observer*, v. XXXI, no. 6, p. 17.
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

Extreme Waves

By Craig B. Smith, 2006, 267 pages: Joseph Henry Press, ISBN 0-309-10062-3. Most waves are simply rhythmic expressions of Earth's movement through space, and the changes they bring to shorelines are gradual. But given the right weather conditions and combination of natural forces, waves can be catastrophic. Extreme waves can stretch 100-feet high, posing an imminent threat to large sea vessels and coastal structures. The lessons of the 2005 Bay of Bengal tsunami and the damage wrought by recent tidal surges in New Orleans underscore the need for better tracking and prediction of extreme waves. Covering both the headline stories and incidents that are less known but equally startling, author and amateur sailor Craig B. Smith weaves a fascinating history of waves.

From: *Natural Hazards Observer*, v. XXXI, no. 6, p. 17.
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

Contemporary Disaster Review

Contemporary Disaster Review is an online international journal, hosted by the Department of Sociology and Anthropology at Millersville University of Pennsylvania, USA. It is a peer reviewed scholarly journal that is freely available to researchers, practitioners, media personnel, as well as the general public. Everyone is invited to link, cite, print, photocopy and distribute material from the CDR.

<http://muweb.millersville.edu/~cdr/>

The Great Sumatra Earthquakes and Indian Ocean Tsunamis of 26 December 2004 and 28 March 2005

A printed version of the special issue of *Earthquake Spectra* [journal] dated June 2006 is now available from EERI to members only for \$60 plus shipping (plus tax to California residents). Nonmembers must order it from UNESCO. It was edited by Wilfred D. Iwan and jointly published with UNESCO. The 900+ page issue contains 44 full reports by members of several reconnaissance teams of scientists and engineers from many of the affected countries as well as the United States, Canada, New Zealand, and Japan.

To place an order online, visit

http://www.eeri.org/cds_publications/catalog/. The report is listed under "New Products".

From: EERI Newsletter, v. 41, no. 2, p. 5

WEBSITES

<http://nthmp.tsunami.gov/index.html>

The new website of the National Tsunami Hazard Mitigation Program.

<http://www.tsunami.noaa.gov>

Just a reminder about the National Oceanic and Atmospheric Administration (NOAA) Tsunami website. It contains information about tsunamis, NOAA's role with tsunami studies and warning systems, and tsunami mitigation plans.

<http://www.gwu.edu/~icdrm/publications/PDF/GLOSSARY%2002-19-2007.pdf>

A glossary developed by the Institute for Crisis, Disaster, and Risk Management at George Washington University. It contains definitions to terms used in emergency management and disaster response.

http://cdd.unm.edu/products/tip_web020205.pdf

For first responders and emergency professionals responding to disaster, this document, developed by the University of New Mexico Center for Development and Disability, presents easy-to-understand tips on how best to assist people with some types of disability, including seniors, people with service animals, people with mobility impairments, the mentally ill, the blind, people with

chemical sensitivities, the autistic, and people who are deaf or hard of hearing.

<http://www.snopes.com/photos/tsunami/tsunami1.asp>

A report about photo hoaxes collected off the Internet after the Indian Ocean tsunami. The dramatic photographs document, not the 2004 tsunami, but a 2002 tidal bore in China.

<http://www.seismic.ca.gov/pub/CSSC%2005-03%20Tsunami%20Findings.pdf>

The tsunami threat to California—Finding and recommendations on tsunami hazards and risks, Dec. 2005, by the State of California Seismic Safety Commission.

www.spidernetwork.org

The Science and Policy Interfaces for Disaster Reduction (SPIDER) Network is composed of six UK-based academic departments from different universities and promotes the work of new researchers in the disaster field. The network lists a goal of re-examining the role of scientific knowledge for disaster risk reduction.

From: Disaster Research, June 28, 2007, p. 4

www.operationhope.org/pdpg/

Personal Disaster Preparedness Guide, developed by Operation HOPE, a national organization that intends to empower underserved U.S. communities, allows users to fill in important information, including emergency contacts, phone numbers, necessary medications, and meeting locations. The site then turns that information into a convenient "Personal Disaster Preparedness Guide" to be readily accessible during and after disaster.

From: Disaster Research, June 28, 2007, p. 4

www.sia.org/frg_files/FirstResponder'sGuidetoSatelliteCommunications.pdf

Produced by the Satellite Industry Association, *First Responder's Guide to Satellite Communications* is a comprehensive overview and tutorial of satellite technology and its role in the response to natural and human-induced disasters. Included in the guide is a glossary of terms, an overview of satellite capabilities, and easy-to-follow steps for using satellite data.

From: Disaster Research, June 28, 2007, p. 4

www.dmphp.org

The American Medical Association has unveiled its newest publication, *Disaster Medicine and Public Health Preparedness*. The new quarterly, peer-reviewed journal is the first comprehensive publication emphasizing public health preparedness and disaster response for all health care professionals.

From: Disaster Research, June 28, 2007, p. 4

<http://www.gao.gov/docsearch/abstract.php?rptno=GAO-07-821T>

This new Government Accountability Office (GAO) study, *Emergency Management: Status of School Districts' Planning and Preparedness*, notes that the nation's public schools lack the equipment and expertise necessary to deal with a range of emergencies, including terrorist attacks, natural disasters, and biohazard catastrophes. By examining school emergency preparedness nationwide, the GAO found that many schools are insufficiently prepared because they have not trained and integrated their response plans with local first responders, hospitals, or their city governments.

From: Disaster Research, June 28, 2007, p. 5

http://www.temple.edu/newsroom/2006_2007/05/Stories/HCWstudy.htm

Will healthcare staff report to work during crises? Two studies presented at the 2007 Society for Academic Emergency Medicine Annual Meeting examined psychological barriers that might keep doctors, nurses, and support staff from reporting to work in a disaster.

"Healthcare Worker Response to Disaster Conditions," a report from researchers at Temple University, notes that healthcare workers would be more likely to report to work when they felt that they could be effective in their job and believed it was important for them to work under crisis conditions, according to the lead researcher, Linda Kruus.

From Disaster Research 479, p. 1. Natural Hazards Center, University of Colorado at Boulder

<http://www.alertnet.org/thefacts/reliefresources/118010059499.htm>

Inaction on disasters is not an option. Written by Salvano Briceno, director of the U.N. Secretariat of the International Strategy for Disaster Reduction, this Reuters commentary warns that extremely large disasters loom in our future, especially if we choose to do nothing to mitigate their impacts. Inaction creates the final condition for human tragedy, Briceno writes. "The cost of doing something is modest. But the price of doing nothing will be catastrophic. We know what to do. We know, better than ever, how to do it. And above all, we know that to do nothing is not an option," the article states.

From Disaster Research 479, p. 3. Natural Hazards Center, University of Colorado at Boulder

http://www.iaem.com/documents/fema_org_chart.pdf
FEMA organizational chart.

<http://tsunami-news.newslib.com/>

NewsLib: The Free News Library. NewsLib is an automated news tracking system. It allows people to specify topics in which they are interested, then starts

searching for relevant online articles and storing the links to those articles.

Why was NewsLib created?

News broadcasters tell you what's happening now. Wouldn't you like a simple and quick way to find out what had happened before? We did, so we built this system to track important news about any topic over time.

The website URL given above will take you to the Tsunami News page, where articles on tsunamis will be listed in reverse chronological order, starting from whatever 'yesterday's date' was.

CONFERENCES

August 21-22, 2007

7th Emergency management conference—Essential services and infrastructure. Melbourne, Australia. Organized by Emergency Services Foundation, the annual conference will unite emergency management professionals from emergency services organizations; local, state, and federal governments; community groups; and industry, while focussing on essential services and infrastructure.

For more information, info@hpe.com.au or <http://www.hpe.com.au/contents/hpe.html>

August 21-25, 2007.

International Disaster Reduction Conference (IDRC 2007)--Harbin, China: The International Disaster Reduction Conference (IDRC 2007) is a follow-up to the IDRC

2006 Conference in Davos, Switzerland, which brought a growing consensus that to achieve risk-resilient, sustainable societies, the management of unexpected events such as natural hazards, disease, man-made hazards, or terrorism, must take an integrated approach.

IDRC Harbin 2007 will review the progress made since IDRC Davos 2006, provide a platform for in-depth, strategic discussions, and focus on understanding what is needed to implement integrated risk management. IDRC Harbin 2007 will also host an exhibition for international and national organizations and for companies with products and services for emergency and rescue operations.

More information is available at www.idrc.info.

From: Disaster Research, June 28, 2007, p. 5

September 27-October 2, 2007

NEMA annual conference, Oklahoma City, OK, organized by the National Emergency Management Association. This conference provides an opportunity for emergency managers to meet and discuss the many challenges that face the community today, share solutions, grow professionally, and network with peers. Attendees will hear from those involved in shaping the future of homeland security and emergency management, strengthen relationships with partner organizations, and discuss

NEMA's views on all-hazards emergency preparedness with the leadership in Washington.

For more information: www.nemaweb.org.

From: *Natural Hazards Observer*, v. XXXI, no. 6, p. 22.
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf>

October 29, 2007-November 3, 2007

The National Tsunami Hazard Mitigation Program national conference, Honolulu, Hawaii.

November 6-8, 2007

4th Annual Canadian Risk and Hazards Network (CRHNet) Symposium will be held in Vancouver, British Columbia, Canada. This year's symposium focuses on the theme "Fostering Partnerships for Disaster-Resilient Communities." For more information:

<http://www.jibc.ca/crhnet/papers/papers.htm>

From: *EERI Newsletter*, v. 41, no. 4, p. 6

April 22-26, 2008

National Earthquake Conference, Seattle, Washington, USA. For more information:
<http://www.earthquakeconference.org/>.



BOOK REVIEW

New book from PERI described history of emergency management in the United States

(Fairfax, Virginia, June 6, 2007) – The Public Entity Risk Institute (PERI), a nonprofit risk management training and educational organization, today announced the release of an important new book on the evolution of emergency management in the United States. *Emergency Management: The American Experience 1900-2005* examines major disaster events that have occurred over the past century and explains how lessons learned from these historical events have driven change in emergency management functions and systems over time.

"Our goal in creating this book was to fill a major information gap by providing a historical perspective to the ongoing dialogue about how best to improve the effectiveness of emergency management systems in the United States," explained Gerard Hoetmer, Executive Director of PERI. "We need to understand where the current system came from and why, so we can determine what's working and what isn't."

Emergency Management: The American Experience 1900-2005 covers more than a century of catastrophic events including earthquakes, floods, hurricanes, droughts, a pandemic, and an explosion. Each chapter examines a timeframe that was pivotal in the evolution of emergency management in the U.S. The book focuses on policy and administrative changes and answers the key questions:

- Why did the federal government get involved in emergency management?
- Why and how has that role changed?

Funded by PERI, the book was edited by Claire B. Rubin, a well-known disaster researcher and consultant. A detailed table of contents is available at www.riskinstitute.org/PERI/PTR/Emergency+Management+The+American+Experience+1900-2005.thm

The book is available in the PERI Online Bookstore at www.riskinstitute.org/PERI/Bookstore.

From: *Unscheduled Events*, v. 26, no. 2, May 2007, p. 11 (Center for Disaster Research & Education – Millersville University of Pennsylvania)

Available online at

http://muweb.millersville.edu/~ue/UE_MAY_2007.pdf ◆

Stop Disasters Game

United Nations/International Strategy for Disaster Reduction (UN/ISDR). Free online.
www.stopdisastersgame.org

This online game is a new educational tool to promote disaster risk reduction among children who are most vulnerable when disasters occur. With three levels of difficulty, the object of the game is to save lives and livelihoods by preparing for a tsunami, earthquake, hurricane, flood, and wildfire.

For example, within a specific budget and time limit, players have upgrading options, such as building more resilient houses or setting up early warning systems. Although the game is targeted at children aged 9 to 16, anyone can play and learn more about preventing disasters.

The game was developed as part of the 2006-2007 Disaster Risk Reduction Begins at School Campaign, which aims to ensure that disaster risk reduction is fully integrated into school curricula in disaster-prone countries and that school buildings are built or retrofitted to withstand natural disasters.

From: *Natural Hazards Observer*, v. XXXI, no. 6, p. 16.
<http://www.colorado.edu/hazards/o/archives/2007/july07/JulyObserver07.pdf> ◆

For an update on Mzee (130-year old Aldabran tortoise) and Owen (baby hippo whose family was killed in 2004 tsunami), check out the National Geographic pages:

http://news.nationalgeographic.com/news/2006/01/0105_060105_hippo_tortoise.html

The Owen and Mzee webpage is
<http://www.owenandmzee.com/> ◆

**Western States Seismic Policy Council
2007 Awards in Excellence**

http://www.wsspc.org/Awards/2007/index_b.html

Awards will be presented at the WSSPC-ICC Annual Conference Awards in Excellence Luncheon, Tuesday October 2, 2007

**WESTERN STATES SEISMIC POLICY COUNCIL HONORS
RICHARD K. EISNER WITH A 2007 LIFETIME ACHIEVEMENT AWARD IN EARTHQUAKE
RISK REDUCTION**

The Western States Seismic Policy Council is pleased to announce that Richard K. Eisner has been awarded the 2007 WSSPC Lifetime Achievement Award in Earthquake Risk Reduction. WSSPC created the Award to recognize outstanding leaders in earthquake risk reduction. This person will have demonstrated throughout his or her career an extraordinary commitment, level of service, and contribution of the application of earthquake risk reduction to public policy.

**Lifetime Achievement Award
Richard K. Eisner**

**WESTERN STATES SEISMIC POLICY COUNCIL ANNOUNCES RECIPIENTS OF ITS 2007
AWARDS IN EXCELLENCE**

**Overall Award for Excellence in Mitigation
Award Category: Mitigation**

Administering Agency: **Hawaii State Civil Defense, Hawaii State Earthquake Advisory Committee,
Hawaii Coastal Zone Management Program**

Program Name: *Earthquake Hazards and Estimated Losses in the County of Hawaii*

**Award Category: Outreach to Business/Government, Schools,
and General Public**

Administering Agency: **Lincoln County (Oregon) School District**

Program Name: *Earthquake/Tsunami Preparedness Program*

Award Category: Research Efforts

Administering Agency: **Utah Geological Survey/WSSPC Basin & Range Province Committee**

Program Name: *Basin & Range Province Earthquake Working Group*

Award Category: Innovations (Public-Private Partnerships)

Administering Agency: **Oregon Natural Hazards Workgroup at the University of Oregon**

Program Name: *Partners for Disaster Resistance & Resilience*

Award Category: Non-Profit Agency Efforts

Administering Agency: **Pacific Tsunami Museum**

Program Name: *Walking & Driving Tours of Historical Tsunami Sites*

Materials added to the NTHMP Library

July – August 2007

Note: These, and all our tsunami materials, are included in the online (searchable) catalog at <http://www.dnr.wa.gov/geology/washbib.htm>. Type 'tsunamis' in the Subject field to get a full listing of all the tsunami reports and maps in the collection.

Baba, M.; Kurian, N. P.; Krishnan, B. T. Murali; Nirupama, N.; Murty, T. S., 2006, Analysis of the tsunami of December 26, 2004, on the Kerala Coast of India, part 2--Arrival times: *Marine Geodesy*, v. 29, no. 4, p. 271-276.

Balaji, R.; Sannasiraj, S. A.; Sundar, V., 2006, Tsunami wave interaction with data buoys: *Marine Geodesy*, v. 29, no. 4, p. 235-251.

Bernard, Eddie N., 2002, The U.S. National Tsunami Hazard Mitigation Program. IN Ewing, Lesley; Wallendorf, Louise, editors, *Solutions to coastal disasters '02--Conference proceedings: American Society of Civil Engineers*, p. 964-971.

Bilek, S. L.; Engdahl, E. R., 2007, Tsunamigenic earthquakes in the Java subduction zone—Rupture characterization and relocation of aftershocks for the 1994 and 2006 earthquakes [abstract]: *Seismological Research Letters*, v. 78, no. 2, p. 273.

Borrero, Jose C., 2002, Field survey of the June 23, 2001 earthquake and tsunami in southern Peru. IN Ewing, Lesley; Wallendorf, Louise, editors, *Solutions to coastal disasters '02--Conference proceedings: American Society of Civil Engineers*, p. 892-904.

California Seismic Safety Commission, 2005, *The tsunami threat to California: California Seismic Safety Commission*, 15 p.

Camerlenghi, Angelo; Urgeles, Roger; Ercilla, Gemma, 2006, *Scientific ocean drilling behind the assessment of geo-hazards from submarine slides, extended report--Magellan workshop series, Barcelona, 25-27 October 2006: European Science Foundation*, 10 p.

Dengler, Lori, 2007, Solomon Islands earthquake and tsunami of April 1, 2007: *EERI Newsletter*, v. 41, no. 5, p. 6.

Farreras, Salvador; Ortiz, Modesto, 2002, Tsunami risk and vulnerability assessment for industrial ports of Mexico. IN Ewing, Lesley; Wallendorf, Louise, editors,

Solutions to coastal disasters '02--Conference proceedings: American Society of Civil Engineers, p. 708-719.

Fisher, Donald; Mosher, David; Austin, James A., Jr.; Gulick, Sean P. S.; Masterlark, Timothy; Moran, Kathryn, 2007, Active deformation across the Sumatran forearc over the December 2004 Mw9.2 rupture: *Geology*, v. 35, no. 2, p. 99-102.

Geist, Eric L.; Titov, Vasily V.; Synolakis, Costas E., 2006, Tsunami--Wave of change: *Scientific American*, v. 294, no. 1, p. 56-63.

George, David L.; LeVeque, Randall J., 2006, Finite volume methods and adaptive refinement for global tsunami propagation and local inundation: *Science of Tsunami Hazards*, v. 24, no. 5, p. 319-328.

Gisler, Galen; Weaver, Robert; Gittings, Michael L., 2006, Two-dimensional simulations of explosive eruptions of Kick-em Jenny and other submarine volcanos [sic]: *Science of Tsunami Hazards*, v. 25, no. 1, p. 34-41.

Hirshorn, B., 2007, The Pacific Tsunami Warning Center response to the Mw6.7 Kiholo Bay earthquake and lessons for the future [abstract]: *Seismological Research Letters*, v. 78, no. 2, p. 298.

Horrillo, Juan; Kowalik, Zygmunt, 2006, Wave dispersion study in the Indian Ocean tsunami of December 26, 2004: *Science of Tsunami Hazards*, v. 25, no. 1, p. 42-63.

Joku, Gordon N.; Davies, Jocelyn M.; Davies, Hugh L., 2007, Eyewitness accounts of the impact of the 1998 Aitape tsunami, and other tsunamis in living memory, in the region from Jayapura, Indonesia, to Vanimo, Papua New Guinea: *Pure and Applied Geophysics*, v. 164, no. 2-3, p. 433-452.

Keating, Barbara H., 2006, 2006--Status of tsunami science research and future directions of research: *Science of Tsunami Hazards*, v. 24, no. 5, p. 385-395.

Kelletat, Dieter; Scheffers, Anja, 2003, Chevron-shaped accumulations along the coastlines of Australia as potential tsunami evidences?: *Science of Tsunami Hazard*, v. 21, no. 3, p. 174-188.

Knight, Bill, 2006, Model predictions of Gulf and southern Atlantic coast tsunami impacts from a distribution of sources: *Science of Tsunami Hazards*, v. 24, no. 5, p. 304-312.

Komar, Paul D.; Marra, John J.; Allan, Jonathan C., 2002, Coastal-erosion processes and assessments of setback

- distances. IN Ewing, Lesley; Wallendorf, Louise, editors, Solutions to coastal disasters '02--Conference proceedings: American Society of Civil Engineers, p. 808-822.
- Kong, L.; Mooney, W. D.; Kelly, A., 2007, Preparing for the next tsunami--Training in seismology and tsunami warnings in the Indian Ocean region [abstract]: Seismological Research Letters, v. 78, no. 2, p. 274.
- Kumar, K. A.; Achyuthan, H., 2006, A record of palaeo-tsunami in the Indian Ocean: Marine Geodesy, v. 29, no. 4, p. 253-263.
- Kurian, N. P.; Baba, M.; Rajith, K.; Nirupama, N.; Murty, T. S., 2006, Analysis of the tsunami of December 26, 2004, on the Kerala Coast of India, part 1--Amplitudes, Marine Geodesy, v. 29, no. 4, p. 265-270.
- Kurian, N. P.; Rajith, K.; Krishnan, B. T. Murali; Nirupama, N.; Murty, T. S., 2006, Analysis of the tsunami of December 26, 2004, on the Kerala Coast of India, part 3--Inundation and initial withdrawal: Marine Geodesy, v. 29, no. 4, p. 277-281.
- Liu, S.; Shi, Y.; Wang, M. S.; Yuen, D., 2007, Tsunami modeling of the Pingtung earthquake, Taiwan--December 26th, 2006 [abstract]: Seismological Research Letters, v. 78, no. 2, p. 275.
- Loomis, Harold G., 2006, Momentum as a useful tsunami descriptor: Science of Tsunami Hazards, v. 24, no. 5, p. 313-318.
- Mori, Jim; Mooney, Walter D.; Afnimar; Kurniawan, Sandy; Anaya, Aan Ibnu; Widiyantoro, Sri; 2007, The 17 July 2006 tsunami earthquake in West Java, Indonesia: Seismological Research Letters, v. 78, no. 2, p. 201-207.
- Nishenko, S. P.; Thio, H. K.; Page, W. D.; Dengler, L.; Ichinose, G., 2007, Tsunami simulations for Humboldt Bay, California [abstract]: Seismological Research Letters, v. 78, no. 2, p. 275.
- Papatheodorou, G.; Stefatos, A.; Charalambakis, M.; Ferentinos, G., 2006, Holocene gravitative mass movements and tsunami hazards in a highly active arc system--The Hellenic Arc. IN Submarine mass movements and their consequences (2005-2009)--IUGS-UNESCO's International Geoscience Programme 115: Geophysical Research Abstracts, v. 8, no. 07164.
- Pararas-Carayannis, George, 2006, The potential of tsunami generation along the Makran subduction zone in the northern Arabian Sea, case study--The earthquake and tsunami of November 28, 1945: Science of Tsunami Hazards, v. 24, no. 5, p. 358-384.
- Plafker, G.; Ward, S. N.; Nishenko, S. P.; Cluff, L. S.; Coonrad, J.; Syahrial, D., 2007, New evidence of a near field intraplate fault source for the cataclysmic tsunami of 12/26/2004 on NW Sumatra [abstract]: Seismological Research Letters, v. 78, no. 2, p. 274.
- Puga-Bernabeu, Angel; Martin, Jose M.; Braga, Juan C., 2007, Tsunami-related deposits in temperate carbonate ramps, Sorbas Basin, southern Spain: Sedimentary Geology, v. 199, no. 3-4, p. 107-127.
- Rivera, Paul C., 2006, Modeling the Asian tsunami evolution and propagation with a new generation mechanism and a non-linear dispersive wave model: Science of Tsunami Hazards, v. 25, no. 1, p. 18-33.
- Salamon, Amos; Rockwell, Thomas; Ward, Steven N.; Guidoboni, Emanuela; Comastri, Alberto, 2007, Tsunami hazard evaluation of the eastern Mediterranean historical analysis and selected modeling: Bulletin of the Seismological Society of America, v. 97, no. 3, p. 705-724.
- Satake, K.; Okal, E. A.; Borrero, J. C., 2007, Tsunami and its hazard in the Indian and Pacific Oceans--Introduction: Pure and Applied Geophysics, v. 164, no. 2-3, p. 249-259.
- Synolakis, Costas E.; Yalciner, Ahmet C.; Borrero, Jose C.; Plafker, George, 2002, Modeling of the November 3, 1994 Skagway, Alaska tsunami. IN Ewing, Lesley; Wallendorf, Louise, editors, Solutions to coastal disasters '02--Conference proceedings: American Society of Civil Engineers, p. 915-948.
- Tappin, D. R.; Tyler, Paul; Moran, K.; Copley, Jon; McMurtry, G., 2006, Dating submarine mass failures and relationships to tsunami generation--The use of multi-beam bathymetry and seabed images, examples from the Pacific and Indian Oceans. IN Submarine mass movements and their consequences (2005-2009)--IUGS-UNESCO's International Geoscience Programme 511: Geophysical Research Abstracts, v. 8, no. 09175.
- Theilen-Willige, Barbara, 2006, Emergency planning in northern Algeria based on remote sensing data in respect to tsunami hazard preparedness: Science of Tsunami Hazards, v. 25, no. 1, p. 3-17.
- Thio, H. K.; Somerville, P. G.; Ichinose, G.; Polet, J., 2007, A probabilistic tsunami hazard model for western North America [abstract]: Seismological Research Letters, v. 78, no. 2, p. 274-5.
- United Nations Environmental Programme, 2006?, Assessing coastal vulnerability--Developing a global index for measuring risk: United Nations, 54 p.
- University of Hawaii; Mississippi State University; Western Michigan University; East Tennessee State

University; University of Tasmania, [2007?], Ocean Shores, Washington--US tsunami survey collaborators report, preliminary:University of Hawaii?, 1 v.

Viana-Baptista, M. A.; Soares, P. M.; Miranda, J. M.; Luis, J. F., 2006, Tsunami propagation along Tagus estuary (Lisbon, Portugal)--Preliminary results: Science of Tsunami Hazards, v. 24, no. 5, p. 329-338.

Walters, Roy A.; Goff, James; Wang, Kelin, 2006, Tsunamiogenic sources in the Bay of Plenty, New Zealand: Science of Tsunami Hazards, v. 24, no. 5, p. 339-357.

Whitlow, Kate; Yulianto, Eko; Fujino, Shigehiro; Rubin, Charles; Sieh, Kerry, 2007, Preliminary results of paleo-tsunami deposits along the Sunda megathrust, Simeulue Island, Sumatra [abstract]: Geological Society of America Abstracts with Programs, v. 39, no. 4, p. 6.

Wood, Nathan; Good, James; Goodwin, Robert, 2002, Reducing vulnerability of ports and harbors to earthquake and tsunami hazards. IN Ewing, Lesley; Wallendorf, Louise, editors, Solutions to coastal disasters '02—Conference proceedings: American Society of Civil Engineers, p. 949-963. ♦



Phuket, Thailand tsunami sign

NTHMP Steering Committee

The U. S. tsunami effort is being coordinated by a Steering Committee composed of representatives from:
National Oceanic and Atmospheric Administration (NOAA) (Chair)
Department of Homeland Security/Federal Emergency Management Agency (DHS/FEMA)
U.S. Geological Survey (USGS)
National Science Foundation (NSF)
U.S. coastal states
Pacific territories/commonwealths
Puerto Rico
U.S. Virgin Islands

From: <http://nthmp.tsunami.gov/organization.html>

Tsunami sign placement guidelines

By Mark Darienzo

Oregon Department of Geology and Mineral Industries
Open File Report 03-06

2003, 11 p.

<http://sarvis.dogami.state.or.us/sub/earthquakes/Coastal/OF0306Signs.pdf> ♦

California town bans tsunamis

(Pismo Beach, California) With beachside tourist sites around the world suffering from reduced business after the tsunami of December 26, 2004 in Indonesia, a California town is fighting back. Pointing to theories that tsunamis might actually be the result of additional stresses on the earth from global warming, the Pismo Beach city council has passed a local ordinance that will make the popular sea-side community a "tsunami-free" zone.

Pismo Beach lawyers explain that the ordinance paves the way for future litigation if indeed a connection is made between tsunamis and manmade global warming in a court of law.

The city council hopes that the ordinance will also help keep coastal property values high since property owners will have the additional peace of mind that, if their property is damaged by a tsunami, they will have legal recourse to recover damages.

It is also believed that posting of "tsunami-free" signs will have a positive psychological effect on tourists, who will feel somewhat safer visiting a town that is proactive about addressing the tsunami problem. At a minimum, the signs themselves are expected to attract additional tourist business as popular photo opportunity spots.

Already, neighboring communities are considering similar ordinances. For instance, Malibu is not only considering a tsunami ban, but is also discussing a possible ban on maximum daytime temperatures greater than 100 deg.F. City attorney Peter Bono told *ecoEnquirer*, "Like Pismo Beach, we see merit in legally protecting ourselves from damages due to the acts of mankind, whether they are directly, or only indirectly, related to global warming."



From: <http://www.ecoenquirer.com/tsunami-ban.htm> ♦

INFREQUENTLY ASKED QUESTIONS COMPILED BY LEE WALKLING

WHICH US CITY RANKED THE HIGHEST IN TERMS OF DISASTER PREPAREDNESS?

New York is the most prepared of 10 major metropolitan areas in the US, according to a new AT&T Business Continuity study released last week [June 6, 2007]. Which cities are not as prepared?

According to a ComputerWorld.com article by Brian Fonseca, Cleveland and Minneapolis/St. Paul fared the worst in the survey of the 10 cities. "The rankings were based primarily on three criteria: the state of a city's business continuity plan; whether the city has adequately educated employees about the plan and installed systems to implement it; and on cybersecurity policies and the use of managed security," Fonseca says.

The cities rankings were: New York, Houston, San Francisco, Boston, Memphis/Nashville, Atlanta, Chicago, Los Angeles, Minneapolis/St. Paul and Cleveland.

WHAT ARE THE CHANCES OF A MAJOR CASCADIA QUAKE WITHIN THE NEXT 50 YEARS?

The U.S. Geological Survey estimates a 10 percent to 14 percent chance of another major Cascadia quake within the next 50 years.

From: EERI Newsletter, v. 41, no. 2 p. 5

HOW MUCH TIME WOULD ELAPSE BETWEEN A TSUNAMI BEING GENERATED IN THE CASCADIA SUBDUCTION ZONE OR PUGET SOUND, AND ITS REACHING THE PACIFIC NORTHWEST SHORES?

A tsunami generated in the [Cascadia] subduction zone or in Washington's Puget Sound would allow for a warning of less than 20 minutes.

From: EERI Newsletter, v. 41, no. 2 p. 5

HOW MANY LARGE EARTHQUAKES HAVE OCCURRED ON DECEMBER 26TH IN THE LAST DECADE?

Three. The Hengchun earthquake, December 26, 2006; the Boxing Day (Indian Ocean) earthquake and tsunami, December 26, 2004; and the Bam, Iran earthquake, December 26, 2003.



VIDEO-CD-DVD RESERVATIONS

To reserve tsunami videos, CDs or DVDs, contact *TsuInfo Alert* Video Reservations, Lee Walkling, Division of Geology and Earth Resources Library, 1111 Washington St. SE, MS 47007, Olympia, WA 98504-7007; or e-mail lee.walkling@dnr.wa.gov

Adventures of Disaster Dudes (14 min.). Preparedness for preteens. American Red Cross.

The Alaska Earthquake, 1964 (20 min.) Includes data on the tsunamis generated by that event.

Business Survival Kit for Earthquakes & Other Disasters; What every business should know before disaster strikes (27 min.). Global Net Productions for the Cascadia Regional Earthquake Workgroup, 2003. With CD disaster planning toolkit & other data.

Cannon Beach Fire District Community Warning System (COWS) (21 min.) Explains why Cannon Beach chose their particular warning system.

Cascadia: The Hidden Fire—An Earthquake Survival Guide (10 min.). Global Net Productions, 2001. A promo for a documentary about the Cascadia subduction zone and the preparedness its existence demands of Alaska, Oregon and Washington states. Includes mention of tsunamis.

Disasters are Preventable (22 min.) Ways to reduce losses from various kinds of disasters through preparedness and prevention.

Disaster Mitigation Campaign (15 min.). American Red Cross; 2000 TV spots. Hurricanes, high winds, floods, earthquakes.

Earthquake...Drop, Cover & Hold (5 min.). Washington Emergency Management Division. 1998.

Forum: Earthquakes & Tsunamis (2 hrs.). CTV-23, Vancouver, WA (January 24, 2000). 2 lectures: Brian Atwater describes the detective work and sources of information about the Jan. 1700 Cascadia earthquake and tsunami; Walter C. Dudley talks about Hawaiian tsunamis and warning systems.

International Tsunami Information Centre, 2004, Tsunami warning evacuation news clips and video footage, UNESCO /IOC International Tsunami Information Centre, 1 **DVD**, 12 min.

Killer Wave: Power of the Tsunami (60 min.). National Geographic video.

Mitigation: Making Families and Communities Safer (13 min.) American Red Cross.

Not Business as Usual: Emergency Planning for Small Businesses, sponsored by CREW (Cascadia Regional Earthquake Workgroup) (10 min.), 2001. Discusses disaster preparedness and business continuity. Although it was made for Utah, the multi-hazard issues remain valid for everyone. Websites are included at the end of the video for further information and for the source of a manual for emergency preparedness for businesses.

Numerical Model Aonae Tsunami—7-12-93 (animation by Dr. Vasily Titov) and Tsunami Early Warning by Glenn Farley, KING 5 News (The Glenn Farley portion cannot be rebroadcast.)

Ocean Fury—Tsunamis in Alaska (25 min.) VHS and **DVD**. Produced by Moving Images for NOAA Sea Grant College Program, 2004.

The Prediction Problem (58 min.) Episode 3 of the PBS series "Fire on the Rim." Explores earthquakes and tsunamis around the Pacific Rim

Protecting Our Kids from Disasters (15 min.) Gives good instructions to help parents and volunteers make effective but low-cost, non-structural changes to child care facilities, in preparation for natural disasters. Accompanying booklet. Does NOT address problems specifically caused by tsunamis.

The Quake Hunters (45 min.) A good mystery story,

explaining how a 300-year old Cascadia earthquake was finally dated by finding records in Japan about a rogue tsunami in January 1700

Raging Planet; Tidal Wave (50 min.) Produced for the Discovery Channel in 1997, this video shows a Japanese city that builds walls against tsunamis, talks with scientists about tsunami prediction, and has incredible survival stories.

Raging Sea: KGMB-TV Tsunami Special. (23.5 min.) Aired 4-17-99, tsunami preparedness in Hawaii.

The Restless Planet (60 min.) An episode of "Savage Earth" series. About earthquakes, with examples from Japan, Mexico, and the 1989 Loma Prieta earthquake.

Run to High Ground (14 min.). Produced by Global Net Productions for Washington Emergency Management Division and Provincial Emergency Program of British Columbia, 2004. Features storyteller Viola Riebe, Hoh Tribe. For K-6 grade levels. Have video and **DVD** versions.

Tsunami and Earthquake Video (60 min.). "Tsunami: How Occur, How Protect," "Learning from Earthquakes," "Computer modeling of alternative source scenarios."

Tsunami: Killer Wave, Born of Fire (10 min.). NOAA/PMEL. Features tsunami destruction and fires on Okushiri Island, Japan; good graphics, explanations, and safety information. Narrated by Dr. Eddie Bernard, (with Japanese subtitles).

Tsunami: Surviving the Killer Waves (13 min.). 2 versions, one with breaks inserted for discussion time.

Tsunami Chasers (52 min.). Costas Synolakis leads a research team to Papua New Guinea to study submarine landslide-induced tsunamis. Beyond Productions for the Discovery Channel.

Tsunami Evacuation PSA (30 sec.). DIS Interactive Technologies for WA Emergency Management Division. 2000.

TsunamiReady Education CD, 2005, American Geological Institute Earth Science Week kit.

Understanding Volcanic Hazards (25 min.). Includes information about volcano-induced tsunamis and landslides.

UNESCO/IOC International Tsunami Information Centre, 2005, U.S. National Tsunami Hazard Mitigation Program public information products—B-roll footage, tsunami science, warnings, and preparedness: UNESCO/IOC International Tsunami Information Centre, 1 **DVD**, 57 min.

The Wave: a Japanese Folktale (9 min.) Animated film to start discussions of tsunami preparedness for children.

Waves of Destruction (60 min.) An episode of the "Savage Earth" series. Tsunamis around the Pacific Rim.

Who Wants to be Disaster Smart? (9 min.). Washington Military Department/Emergency Management Division.

2000. A game show format, along the lines of *Who Wants to be a Millionaire?*, for teens. Questions cover a range of different hazards.

The Wild Sea: Enjoy It...Safely (7 min.) Produced by the Ocean Shores Wash. Interpretive Center, this video deals with beach safety, including tsunamis. ♦





Tsunami Hazard Zone



Evacuation Shelter

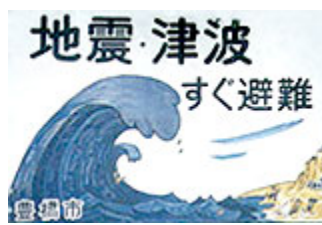


Evacuation Shelter

TSUNAMI SIGNS



Kamakura, Japan Tsunami sign



Takatoyo Beach, Japan



Nera, Japan Tsunami sign



Thailand Evacuation Site



Thailand Evacuation Route



Thailand Buddy sign



Japan Evacuation Site



Japan Danger sign



Japan Shelter sign

From: <http://www.tsunami.org/signs.html>
Reprinted with permission

Pacific Tsunami Museum
Hilo, Hawaii