HB

83

ALASKA STATE LEGISLATURE

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Representative David Guttenberg

MEMO

To: Representative Paul Seaton, Chair
House State Affairs

From: Representative David Guttenberg

Date: February 17, 2005

Re: Hearing request for CS HB 83 (MLV), An Act relating to the Alaska Hazards Safety Commission and providing for an effective date.

I respectfully request a hearing on House Bill 83 in the House State Affairs Committee.

Attached you will find:

- Current version of CS for HB 83 (MLV)
- Sponsor statement
- Additional documentation relating to the bill
- Fiscal notes
- Recent news article that ran in the Anchorage Daily News

I look forward to presenting it before the committee as soon as is convenient. My staff, Danielle Brown-Farrell is assigned to this legislation if there are any questions, 465-4708.

Representative.David.Guttenberg@legis.state.ak.us
http://guttenberg.akdemocrats.org

ALASKA STATE LEGISLATURE

Representative
David Guttenberg

Representative
Gabrielle LeDoux

Sponsor Statement

CS for HB 83

"An Act relating to the Alaska Seismic Hazards Safety Commission; and providing for an effective date."

The CS for HB 83 extends the termination date for the Alaska Seismic Hazards Safety Commission until June 30, 2010 and adds the word "tsunami" to all of the sections addressing the scope of the work of the Alaska Seismic Hazards Safety Commission. This will increase the focus of that Commission to include tsunamis.

With more than 33,000 miles of shoreline, Alaska has been and can be devastated by earthquakes and tsunamis. Since about 1900, Alaska has had 80 magnitude 7 or larger earthquakes. This includes the second- and third- largest worldwide earthquakes, which were larger than the recent earthquake in Indonesia.

Tsunamis can and will greatly affect the fishing industry in coastal Alaska as was evidenced in the1964 Alaska earthquake, which greatly impacted the coastal communities of Prince William Sound and has caused immense damage recently in the fisheries and aquaculture sectors of the affected countries in the Indian Ocean.

Alaska accounts for more than half of all the earthquakes that occur in the U.S. and about ten percent of all earthquakes worldwide. One of the roles of a Seismic Hazards Safety Commission would be to provide a proactive resource for state and local government officials and Alaskan communities that want assistance in acquiring information and guidance necessary to help mitigate earthquake and tsunami hazards.

Alaska's population is growing and the state's infrastructure is developing. The Alaska Seismic Hazards Safety Commission can play a vital role in reducing earthquake related losses. The Alaska Seismic Hazards Safety Commission is an invaluable asset in promoting the earthquake preparation essential to reducing our earthquake threat and future losses to the state that, without effective mitigation measures, are inevitable.

FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number: 1
Bill Version: CSHB 83((MLV)
(H) Publish Date: 2/4/05

Revision Date/Time (Note if correction):
Dept. Affected: Military and Veterans Affairs
Title: Alaska Seismic Hazards Safety Commission
RDU: Military and Veterans Affairs
Component: Homeland Security and Emergency Management
Sponsor: Representative Ledoux
Requester: (H) Special Committee MLV
Component No.: 2657

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type- o not abbreviate)						
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2005) cost: 0.0
Mark this box (X) if funding for this bill is included in the Governor's FY 2006 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

There is no fiscal impact.

Prepared by: John Cramer
Phone (907) 465-4602
Division: Division of Administrative Services
Date/Time 2/1/05 11:58 AM
Approved by: Craig E. Campbell, Commissioner
Date 2/1/2005
Agency: Department of Military and Veterans Affairs

(Revised 9/23/2004 OMB)

FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number: 2
Bill Version: CSHB 83(MLV)
(H) Publish Date: 2/4/05

Revision Date/Time (Note if correction):
Dept. Affected: Natural Resources

Title: An Act relating to the Alaska Seismic Hazards Safety Commission
RDU: Resource Development
Component: Geological Development

Sponsor: Rep. LeDoux, Rep. Guttenberg
Requester: (H) MLV
Component No.: 1031

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimate of any current year (FY2005) cost:
Mark this box (X) if funding for this bill is included in the Governor's FY 2006 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

There is no fiscal impact to DNR associated with implementation of this legislation.

Prepared by: Rod Combellick
Phone: 907-451-5007
Division: Geological & Geophysical Surveys
Date/Time: 2/1/2005

Approved by: Tom Irwin, Commissioner
Date: 2/1/2005
Agency: Natural Resources

(Revised 9/23/2004 OMB)

Thanks for the call concerning the State of Alaska Seismic Hazards Safety Commission. I am particularly concerned that the Commission has never been filled and is facing expiration soon unless commissioners are appointed in the near future. Of all the states, none has a greater need for such a group.

Here are several contacts that may be very helpful. I suggest you contact them.

Representative Dave Guttenberg, House District 8 – Fairbanks. Rep. Guttenberg is also interested in the Seismic Hazards Safety Commission and has both information and expertise.

Commissioner Tom Irwin, Department of Natural Resources. I have been told he has reports and documents related to the Seismic Hazard Safety Commission that have not been released to the public but probably could be made available to members of the state legislature. Ph. 907-465-2400, email: <tom_irwin@dnr.state.ak.us>

Dr. Rod Combellick, Acting Director of the Division of Geological & Geophysical Surveys. Rod is very knowledgeable regarding the Seismic Hazards Safety Commission, the history of its formation, and a lot more. Ph. 907-451-5007, email <rod@dnr.state.ak.us>

Consider the following:

ALASKA IS EARTHQUAKE COUNTRY

Alaska is the most seismically active state in the union. For comparison, California, widely regarded as the benchmark state for earthquake hazards nationally, has experienced 16 magnitude 7 or larger earthquakes historically (since about 1900). A magnitude 7 or larger earthquake is very powerful and if such an earthquake occurs in a populated region will cause widespread and severe damage and may result in casualties. During the same period, Alaska has had 80 magnitude 7 or larger earthquakes, including the second- and third-largest worldwide, the 1964 magnitude 9.2 (Prince William Sound - Kodiak) and 1957 magnitude 9.1 (eastern Aleutian Islands) earthquakes. Both of these were larger than the recent earthquake in Indonesia that generated the catastrophic tsunami in the Indian Ocean, and both generated killer Pacific-wide tsunamis. Indeed, Alaska accounts for more than half of all the earthquakes that occur in the United States and about ten percent of all earthquakes worldwide.

MOST ALASKANS LIVE NEAR BIG ACTIVE FAULTS

Alaska's population is largely concentrated in the seismically active regions of the state. The largest and most active faults in Alaska (and North America) are the Aleutian subduction zone and the Queen Charolette-Fairweather fault. The Aleutian subduction zone extends from northern Prince William Sound near Cordova and Seward southwest to Kodiak and further

west along the Pacific side of the Alaskan Peninsula and Aleutian chain. This is one of the largest faults in the world and one of the most active. It produced both the 1957 and 1964 earthquakes. The Queen Charolette–Fairweather fault system extends through southeast Alaska from the Yakutat-Sitka area south past Juneau, Ketchikan and the other communities in the panhandle. The Queen Charolette–Fairweather fault is the Alaska equivalent of California's San Andreas Fault, just as large, just as active, and for southeast Alaska communities, just as dangerous. Anchorage faces exposure to the Aleutian subduction zone, as illustrated by the damage it caused there in 1964. Anchorage and the Mat-Su valley are in close proximity to the large and highly active Castle Mountain fault and a host of potentially dangerous faults in northern Cook Inlet. Fairbanks also is located in an area of significantly high seismicity from buried active faults that lie beneath the Tanana lowlands.

ALASKANS HAVE BEEN "LUCKY" SINCE 1964

Although a number of strong earthquakes have occurred in Alaska since the devastating 1964 earthquake, all have fortunately been located far away from populated areas. This is somewhat remarkable considering the close correlation between population centers and our largest and most active faults. It is only a matter of time before we experience another serious earthquake that centers on one of our cities. Preparedness is the only antidote we have to mitigate our seismic exposure. The Seismic Hazards Safety Commission is a potentially invaluable asset in promoting the earthquake preparation essential to reduce our earthquake threat and reduce future losses to the state that, without effective mitigation measures, are inevitable.

RECENT LESSONS LEARNED (OR NOT LEARNED)

On Nov. 3, 2002 the Denali fault in the central Alaska Range ruptured and generated a magnitude 7.9 earthquake, the largest "continental" earthquake in North America in the past 150 years. Fortunately the Denali fault is located in a sparsely populated part of the state. However, the fault rupture intersected the Trans-Alaska Oil Pipeline and offset the pipeline about 18 feet. Much to the credit of Alyeska Pipeline Service Company, a thorough study of earthquake hazards to the pipeline was conducted prior to its construction. Where the pipeline crossed the Denali fault special engineering design was incorporated, which allowed the pipe to withstand the 18 feet of offset and strong shaking without failure. The pipeline was only briefly shut down and no oil was spilled. Without the special seismic design considerations the pipeline most certainly would have sustained significant damage and been off line for a much longer period at great cost to the state and the petroleum industry. Since the Denali fault-pipeline crossing is adjacent to the Delta River and the river was thawed and flowing at the time of the earthquake, a large oil spill could have been catastrophic, with oil entering the Delta River, the Tanana and Yukon rivers, and possibly the Bering Sea. The state of Alaska dodged that bullet only because of earthquake preparation in the form of knowledge and engineering design to accommodate the Denali fault hazard. Did we learn anything from this experience? Failure to establish a state Seismic Hazards Safety Commission would suggest we did not.

A REAL AND PRESENT NEED

One of the roles of a Seismic Hazards Safety Commission would be to provide a resource for state and local government officials and Alaskan communities that want assistance in acquiring information and guidance necessary to help mitigate earthquake hazards. For example, presently our community (Kodiak) has determined that there is significant cause to believe some of our schools may not be life-safe in the event of a strong local earthquake. To this end, the Kodiak Island Borough has raised funds through a voter-approved bond issued to investigate the earthquake safety of our schools. Inherent in this process is the need to follow complex FEMA guidelines and understand specialized technical information regarding earthquakes and engineering. Compliance with the FEMA regulations is necessary if we are to qualify for federal funds to accomplish mitigation goals. For almost a year our local government has been struggling with these issues without the necessary expertise and little in the way of sources for advice and guidance. Failure to meet strict FEMA requirements jeopardizes the possibility of federal financial support to mitigate our hazards. The Kodiak community has discovered first-hand how useful a Seismic Hazards Safety Commission would be and how difficult it is for small local governments in the state to dealing with the earthquake mitigation issue.

THE CLOCK IS TICKING

As Alaska grows and our state's infrastructure develops time is passing and the next severe earthquake is drawing closer. Meanwhile, no coherent statewide program is in place to specifically to promote and support earthquake preparedness, and no official group is available to assist Alaska's communities with the mitigation measures needed to reduce our exposure to this threat. Do we need to experience the potentially huge financial losses and casualties a large earthquake in an urban area will bring to our state before we take action to reduce the earthquake hazard? Mitigation pays great dividends and costs very little compared to such losses. However, it is effective only if the mitigation action is done before the earthquake. Alaska cannot afford to stand idly be and wait for the inevitable, the consequences are too great. Establishment of the Seismic Hazards Safety Commission is a powerful first step in saving Alaskan lives, property, and financial well-being. Failure to complete the process by appointing the commission is unconscionable.

Finally, what role could the Commission play in reducing earthquake related losses in the state? According to the Alaska Division of Legislative Audit, Audit Digest #10-20038-05 as posted on the State of Alaska Web Site:
http://www.legaudit.state.ak.us/pages/digests/2005/20038dig.htm

- The mitigation of seismic hazards refers to studying, identifying, and prioritizing actions that could be taken to reduce the impact of earthquakes. The most cited tangible mitigation measure has been modification of zoning and building codes. Accordingly, the actual implementation of many of the commission's earthquake mitigation recommendations would have to be done by local governments. Having local representatives as part of the commission may facilitate the implementation of the commission's recommendations.

- Many local governments adopted the International Building Code (IBC) and have, therefore, already been involved in deciding if they believe it is in the public's interest to

update local codes in conformity with IBC changes. Having more local government members would bring, to the commission, a sense of the local concerns about adding or modifying existing local ordinances for improved earthquake mitigation factors."

Local jurisdiction representation on the commission is very important, but I think it is unfortunate that the legislative audit report's emphasis is placed on the use of building codes and zoning to mitigate seismic hazards. Code and zoning regulation is only a small part of a wide range of possible approaches the commission might take to reduce our exposure to seismic hazards. Some critics of the Commission construe such regulation negatively. Other more important and potentially more useful commission approaches could include co-ordination of state wide education and awareness, development of links with local, state, and federal agencies including FEMA, the US Geological Survey, Association of Structural Engineers, and a host of private and government agencies that could provide a range of assistance to local officials, private industry, and Alaska citizens.

SEAFOOD.COM NEWS [FAO Press statement] 13 January 2005, Washington and Rome -- The tsunami waves have had a devastating impact on the fisheries sector in many countries of the Indian Ocean, FAO said today.

In Sri Lanka, more than 7 500 fishers have been killed by the tsunami and over 5 600 are still missing. More than 5 000 Sri Lankan fishing families have been displaced and 80 percent of coastal fishing vessels have been completely destroyed or very seriously damaged, including around 19 000 boats. Ten out of the 12 main fishing harbours in the country have been completely devastated including infrastructure such as ice plants, cold rooms, workshops and slipways.

FAO has already sent fisheries experts to Sri Lanka to advise the government on the repair and rehabilitation of fishing harbours and infrastructure, fishing boats and fishing gear.

In the Nanggroe Aceh Darussalam Province of Indonesia, where 42 000 fishers and their families live, 70 percent of the small-scale fishing fleet have been destroyed. In Nias Island, about 800 fishing canoes have been destroyed. Two thirds of local fisherfolk from the capital Banda Aceh were killed by the waves.

Fish farming was severely affected in northern Sumatra with about 1 000 fish cage farms having been completely destroyed.

'FAO is currently assessing the damage and will help the government and local authorities to repair and replace fishing boats and gear and start with the initial repair of water fishponds and infrastructure so that fish production can be resumed as soon as possible,' said Jeremy Turner, Chief of the Fishery Technology Service.

In the affected coastal areas of Thailand, 386 fishing villages with a population of around 120 000 people have lost about 4 500 fishing boats, or their fishing gear has been seriously damaged. Most fishing boats are owned by small-scale, traditional fishers. The total damage to marine capture fisheries alone is estimated at around $16.6 million.

Eight fishing harbours and their infrastructure have been seriously damaged. The affected aquaculture industry has suffered a serious setback. A total of around 15 800 fishing cages have been damaged, this has caused losses of about $33 million. In some areas, seafood supplies have dropped by 90 percent since the tsunami.

FAO is preparing support measures for fisherfolk in six southern Provinces of Thailand providing essential fisheries inputs and assisting in the repair of damaged fishing vessels and damaged fishery infrastructure.

In the Maldives, where a very large part of the population depends on fishing for their livelihood, more than one third of all inhabited islands were severely damaged and hundreds of boats and harbours were destroyed. FAO is planning to assist the country with the repair and replacement of fishing boats, engines and fishing gear as well as with

the repair and rehabilitation of fisheries infrastructure.

In the state of Andhra Pradesh in India, fishers along the 1 000 km coastline were the worst hit by the tsunamis. Around 2 000 fishing boats and about 48 000 fishing gears were lost, about 300 000 fishers have lost their jobs. In the state of Tamil Nadu, 591 fishing villages and 30 islands of the Andaman and Nicobar islands have been badly affected by the tsunamis. India's seafood exports may decline by around 30 percent as a result of the tsunami.

In Myanmar, some 200 villages spread along the southern coast and heavily relying on fishing have been hit by tsunamis and lost fishing vessels, fishing gear and infrastructure. Some 17 seaside fishing villages have been reported as destroyed and at least 53 people as killed by the tsunamis. FAO is preparing for a long-term participation in relief and rehabilitation measures for the affected fishing communities.

In Malaysia, the livelihoods of about 6 000 fishers have been affected by the disaster.

In Somalia, around 2 600 fishing boats have been destroyed. FAO is assisting in damage and needs assessments and making preparations for the repair of damaged fishing vessels and for the provision of essential fishing inputs in six southern provinces of the country. FAO will also provide short-term financial aid and training in improved fishing techniques and boatbuilding to about 2 000 fishers.

In the Seychelles, coastal fish farms and the artisanal fisheries sector suffered extensively. A great number of fishing vessels were damaged or lost. The two fish processing plants and cold storage facilities located at the fishing port in Victoria were also affected by the tsunamis. FAO is preparing assistance programmes for the repair and replacement of fishing vessels and landing facilities and for the restoration of sustainable livelihoods in the fisheries sector.

The damage caused by the recent tsunamis in the fisheries and aquaculture sectors of the affected countries is worse and more complex than expected, Turner said.

FAO's Fisheries Department has embarked on a concerted effort to assist the fisheries and aquaculture sectors of the tsunami effected countries through relief and rehabilitation measures and projects.

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January 27, 2005

Representative Gabrielle LeDoux
State Capitol, Room 412
Juneau, Alaska 99801

Re: House Bill 84

Dear Representative LeDoux:

I am writing to you on behalf of State Farm Insurance Companies with respect to House Bill 84. State Farm supported the creation of the Alaska Seismic Hazards Safety Commission and supports your proposal to extend the Commission through another five years. If there is any assistance or information we can provide to you, please feel free to call.

Sincerely,

Sheldon E. Winters

SEW/caf
RepLeDoux01SEW.wpd

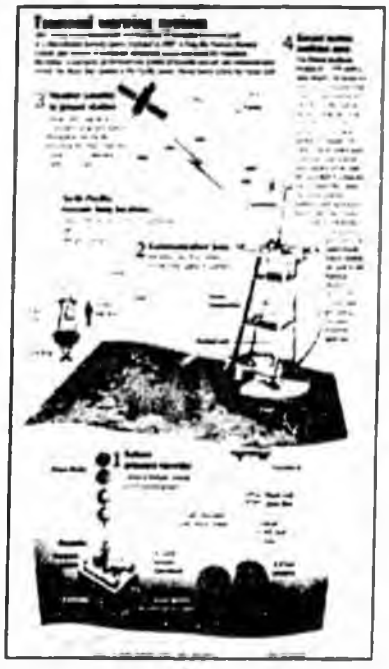
adn.com
Anchorage Daily News

Tsunami warning system won't end threat to Alaska

BUOYS: Purpose of devices is to warn rest of Pacific of waves from earthquakes here.

By TOM KIZZIA
Anchorage Daily News

(Published: January 15, 2005)



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Click on photo to enlarge

Alaskans shouldn't be lulled by the existence of high-seas buoys in the Pacific Ocean into thinking they are much better protected from danger than residents of Banda Aceh in Indonesia, according to earthquake and tsunami experts here.
Photo gallery

The buoys that detect passing waves are subject to breakdown -- as evidenced by the fact that three of the six currently deployed have been out of service for a year.

More significantly, earthquake and tsunami experts said in recent interviews, those buoys are deployed to warn the rest of the Pacific Rim about tsunamis generated by earthquakes in unstable Alaska. An Alaska-generated wave would probably hit the shore here before it reaches the first buoy heading south.

"By the time it gets to the buoy, you better have everybody evacuated," said Paul Whitmore, the scientist-in-charge at the West Coast/Alaska Tsunami Warning Center in Palmer.

The situation is the same in the Indian Ocean. A buoy warning system there might have provided advance warning to Sri Lanka, which was hit several hours after the triggering earthquake Dec. 26. But it would not have alerted the coast of Sumatra, adjacent to the lift zone in the Andaman Sea.

An expanded buoy system in the Pacific, such as the one proposed Friday by the Bush administration, would provide more notice to Alaska of tsunamis coming from other places. But it would be unlikely to help with Alaska's own waves, whether generated by shifting subsea faults or landslides. Both kinds of waves proved devastating here during the 1964 earthquake.

What Alaska does have going for it, compared with the Indian Ocean nations, is a much more extensive deployment of seismometers and a notification system ready to put out alerts of a possible tsunami in a matter of minutes. Alaska also has a series of tidal gauges in coastal communities, helpful to some extent in confirming the existence of a wave as it passes, and a civil defense system drilled in the potential dangers to coastal towns. People have been told not to wait for a siren to evacuate.

"If the ground is shaking hard enough so that you have trouble standing, it's close," state seismologist Roger Hansen said. "I would say go to higher ground."

How high is high enough? Alaska is now mapping its tsunami danger zones. In Homer, for example, state and University of Alaska experts just released last month a new map showing the

expected high-water mark of waves generated by the two likeliest subsea earthquake hazards. The result was surprisingly good news, with only a small segment of the low-lying Homer Spit likely to get washed over. Even so, city officials said, they would evacuate the Spit if the Palmer center reported a wave heading into Cook Inlet.

"We're in the prevention business," Homer fire chief Bob Painter said.

The new "inundation map" is based on mathematical formulas -- accounting for such things as fault lines and sea bottom contours -- first worked out for Kodiak and calibrated against the actual waves that killed six people there after the 1964 Alaska earthquake. The numbers are run through a supercomputer at the University of Alaska Fairbanks. Similar hazard maps are being prepared for Seward and Sitka, Hansen said.

Anchorage is believed to have virtually no danger from long-distance tsunamis because it is at the end of Cook Inlet, whose long shallow straits would dissipate any wave's energy, Hansen said.

The new Homer map doesn't account for what has long been thought the most serious tsunami threat in the area, an eruption and landslide at Augustine Volcano about 60 miles away. Scientists have grown sharply divided over whether the island volcano presents a major tsunami threat.

Apart from Augustine, subsea landslides often trigger local tsunamis with little warning. Chris Waythomas, a hydrologist with the Alaska Volcano Observatory, said five of the seven fatal tsunamis in Alaska history were probably landslide-induced, including the most recent one, in Skagway in 1994.

The Pacific alert system for long-distance waves began to take shape after a 1946 earthquake in the Aleutians produced a wave that surprised Hawaii, killing 159 people along the waterfront in Hilo. Major waves from that quake hit Chile 12 hours later.

Prediction efforts took another big step forward after the magnitude-9.2 earthquake in Alaska in 1964, with establishment of a central information gathering point in Palmer. Most of the deaths caused by the 1964 quake were due to waves, including 10 as far away as Crescent City, Calif.

Today, the Palmer facility is hooked into 150 seismic sites around the world, including 50 outside the Pacific region. When these sites send information of a serious shake, employees notified by beepers are expected on the scene in five minutes. They assess the data and decide whether the quake may have generated a wave. An automatic warning system sends alarms to the National Weather Service, the Coast Guard and various emergency response agencies.

They won't know whether the subsea rumble really created a tsunami until they start to pick up information from tidal gauges at docks in a scattering of coastal towns. Some of those gauges feed information to Palmer via satellite steadily, while others beam data only every half hour, Hansen said.

The deep-sea buoys in the Pacific can pass along more precise measures of a wave's size. But their most important role may be in calling off false alarms. Presumably a tsunami alert has already been issued by the time the wave passes the so-called DART buoys (for "Deep-ocean Assessment and Reporting of Tsunamis"), which are set in water several miles deep. The DART buoys have sensors on the ocean floor capable of gauging the pressure change of waves only half an inch tall as they pass. If no wave is detected, the alarms are called off, saving coastal evacuations that may cost tens of millions of dollars, officials say.

Indeed, the buoy system won kudos in November 2003 when they allowed Hawaii to cancel an evacuation after an ominous 7.5-magnitude quake in the western Aleutians.

"They're better for canceling warnings than issuing them," said Whitmore, at the Palmer center.

Unfortunately, the western Aleutian DART buoy that gave the all-clear in 2003 is currently out of service, as is the buoy off Unalaska and one other off the Oregon coast.

"Some of us on the steering committee are concerned that half the system is down now," state seismologist Hansen said, referring to a national tsunami hazard group made up of five Pacific rim states and three federal agencies.

One of the three broken DART buoys has already been pulled and repaired and is ready for redeployment when winter sailing weather allows, according to National Weather Service spokesman Greg Romano.

"We are taking steps to make it a more rugged system," Romano said.

Increasing the number of deep-sea buoys would provide faster information and would also help triangulate the source and direction of waves, Whitmore said. The wave off Sumatra was over a 600-mile zone, not simply from the quake's epicenter, he said.

For Alaskans near the source of a wave, though, more buoys may not be much help. The first seismographic report of a potential tsunami may be the only useful warning Alaska gets.