



This way to the Tsunami Boat And the 2015 Earthquake-Tsunami Room



Redwood Coast
Tsunami Work Group
a member of the
Earthquake Country Alliance
We're all in this together



HUMBOLDT STATE UNIVERSITY



Featuring a twenty-year history of the Redwood Coast Tsunami Work Group and a return of the tsunami boat

Earthquake - Tsunami Room

“Twenty Years of Preparing for Cascadia Quakes”

Learn about the disasters of 50 years ago

- *About the North Coast Earthquake Threat*

- *About the North Coast Tsunami Threat*

See the tsunami boat that took three years to travel from Japan to Humboldt County



Inside and to the right



The Most Important Take-Away Message



Protecting yourself from injury during the earthquake is where it all begins. You can't evacuate if you are injured during the shaking!



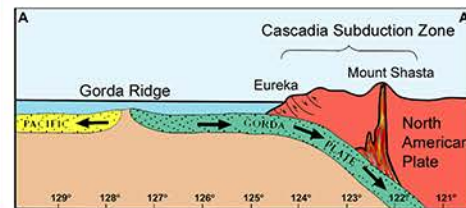
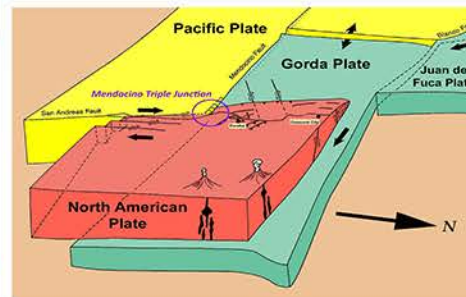
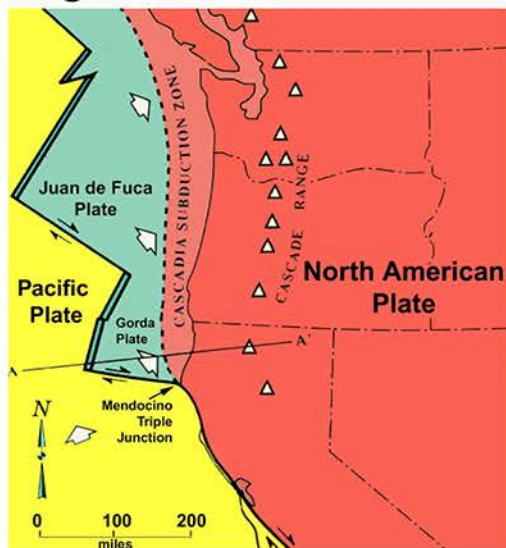
As soon as it is safe to move, get your “grab and go” kit and walk to high ground or inland away from the coast. Take the time to put on shoes as debris may make walking hazardous. Practice the evacuation route before hand so you know where to go.



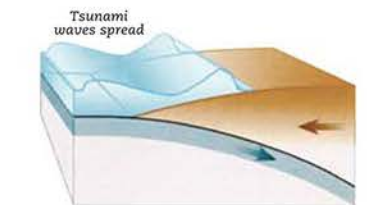
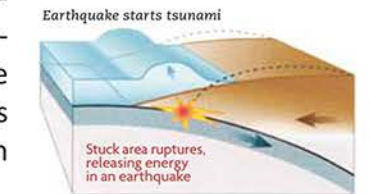
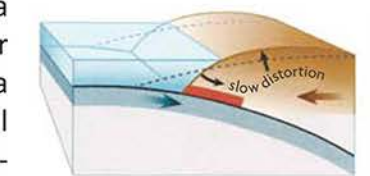
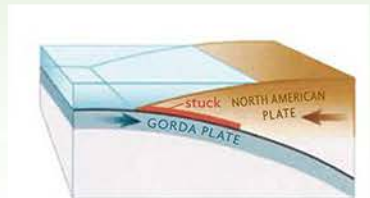
Tsunamis are TRICKY! Just when you think the waves are done, another damaging surge may arrive. The largest waves may arrive many hours after the first. Stay away from the coast until officials say it is safe to return.

What is a Cascadia Subduction Zone Earthquake?

The Cascadia subduction zone is a nearly 700 mile long boundary where the Gorda and Juan de Fuca Plates are pulled beneath the North American plate. The upper part of this boundary is locked. When the accumulated stress overcomes the strength of the locked zone, an earthquake in the magnitude 8.5 to 9 range results.



- **Tsunami** A Cascadia rupture will deform the sea floor lifting the water above it and producing a tsunami. The tsunami will travel outwards in two directions sending surges towards the coast and outwards into the Pacific. The first surges will arrive in as little as ten minutes in Northern California.



- **Shaking area and length** A full rupture of the Cascadia subduction zone will last more than a minute and be felt in California, Oregon, Washington and British Columbia. It might not be any stronger than an onshore earthquake, but will go on for much longer. The extent of damage to roads, bridges and other infrastructure means it will take longer for help to reach you.

Planning efforts for a Cascadia earthquake in California are based on a full rupture - magnitude 9.



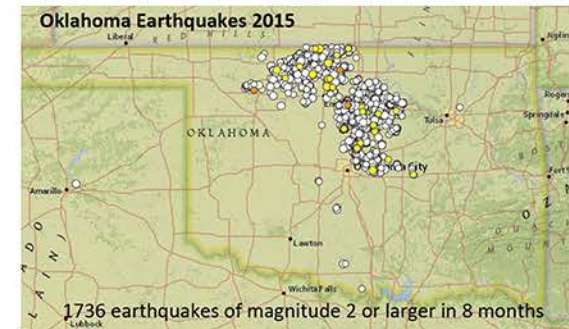
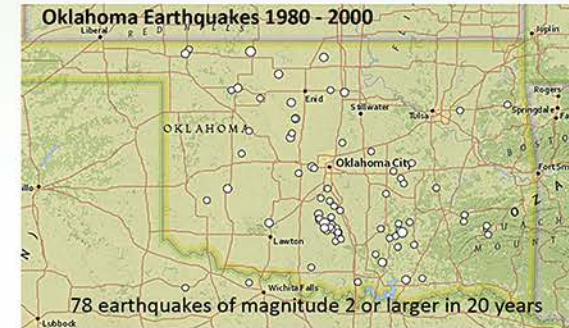
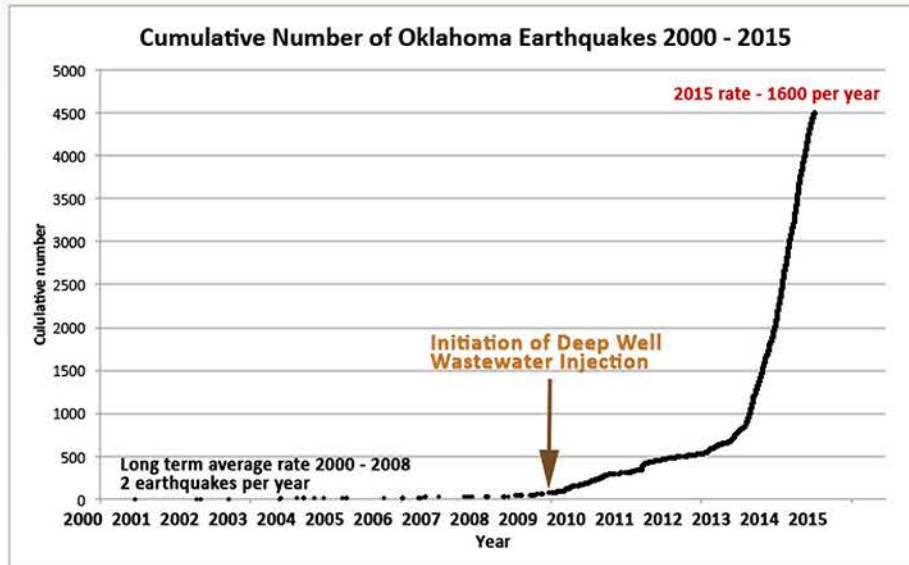
Put a pin in the map where you live or work. If it is in the white area, you are safe. You do not need to evacuate. If it is in the yellow area, plan an evacuation route. Remember, the earthquake shaking is your warning. Head to high ground or inland as soon as the shaking subsides enough for you to safely move. Go on foot - the ground shaking is likely to have disrupted roads.



This map is designed to help you protect yourself from the biggest tsunami likely to hit our area – a magnitude 9 earthquake on the Cascadia subduction zone. It is based on the best currently available information about tsunamis in our region. The map does not show where the water is likely to flow. It shows safe areas (in white) and areas that may be at risk (in yellow). The map may be change as more information becomes available.

What is happening in Oklahoma?

1746 earthquakes of magnitude 2 or larger have been recorded in Oklahoma in 2015, almost twice as many as last year. This compares with only 78 earthquake in the twenty year period between 1980 and 2000! What is going on?



This graph shows the cumulative number of earthquakes from 2000 to the present. What changed around 2009? The requirement that fluid wastes from oil and gas drilling be disposed in deep waste water wells. More waste water has been injected as fracking has increased.

The rate of earthquakes in Oklahoma increased 800 fold from 2015 compared to the long term pre 2010 rate.

This year Oklahoma has finally recognized the increased seismicity as human-caused and is requiring a reduction of the rate and volume of fluid injection

Notable quakes of 2015 (to date):

- **Deadliest quake:** April 25 M 7.8 Nepal, 9,018 deaths

Impacts exacerbated by dense population and earthen structures with no resistance to earthquake shaking and landslides.

- **Largest quake:** April 25 M 7.8 Nepal and May 30 M 7.8 Chichi-jima, Japan. The May 30 earthquake south of Japan was centered 413 miles beneath the surface and unlike the Nepal earthquake of the same size, did no damage.

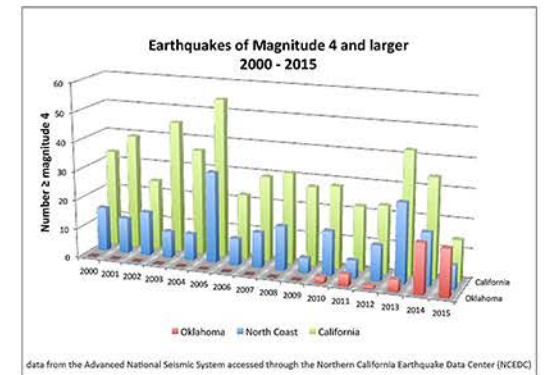
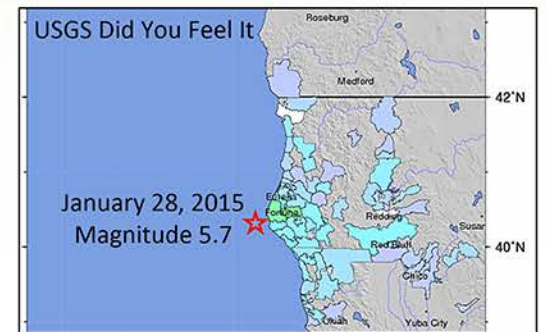
- **Largest US quake:** July 27 M 6.9 Aleutian Islands Alaska, no damage

- **Largest US quake in the lower 48:** January 28 M 5.7, 25 miles SW of Ferndale. The earthquake was felt from Ukiah to Brookings Oregon. No damage reported.

- **State with the most reported felt earthquakes:**

OKLAHOMA! Since January 1, 532 earthquakes of magnitude 3 or larger were reported in Oklahoma. California was way behind with only 93 in the same period.

- **Tsunamis:** It's been a very quiet year so far - five tsunamis detected and the largest only 18 inches high.



2015 The Nepal (Ghorkha) Earthquake

The April 25 magnitude 7.8 earthquake was the deadliest quake of 2015 to date.

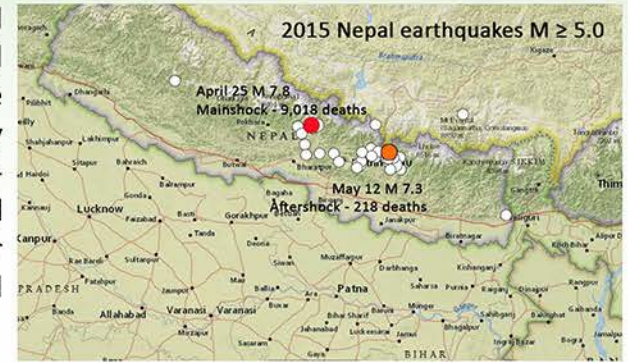


Unreinforced stone and masonry structures caused the greatest loss of life in Nepal. Kathmandu's temples were particularly hard hit.



Kathmandu's Dunbar Square before and after

While the main earthquake did the most damage, additional damage and casualties were caused by aftershocks, especially the May 12 M 7.3. Continuing aftershocks hamper rescue and relief efforts and cause further damage to structures weakened in the first earthquake.

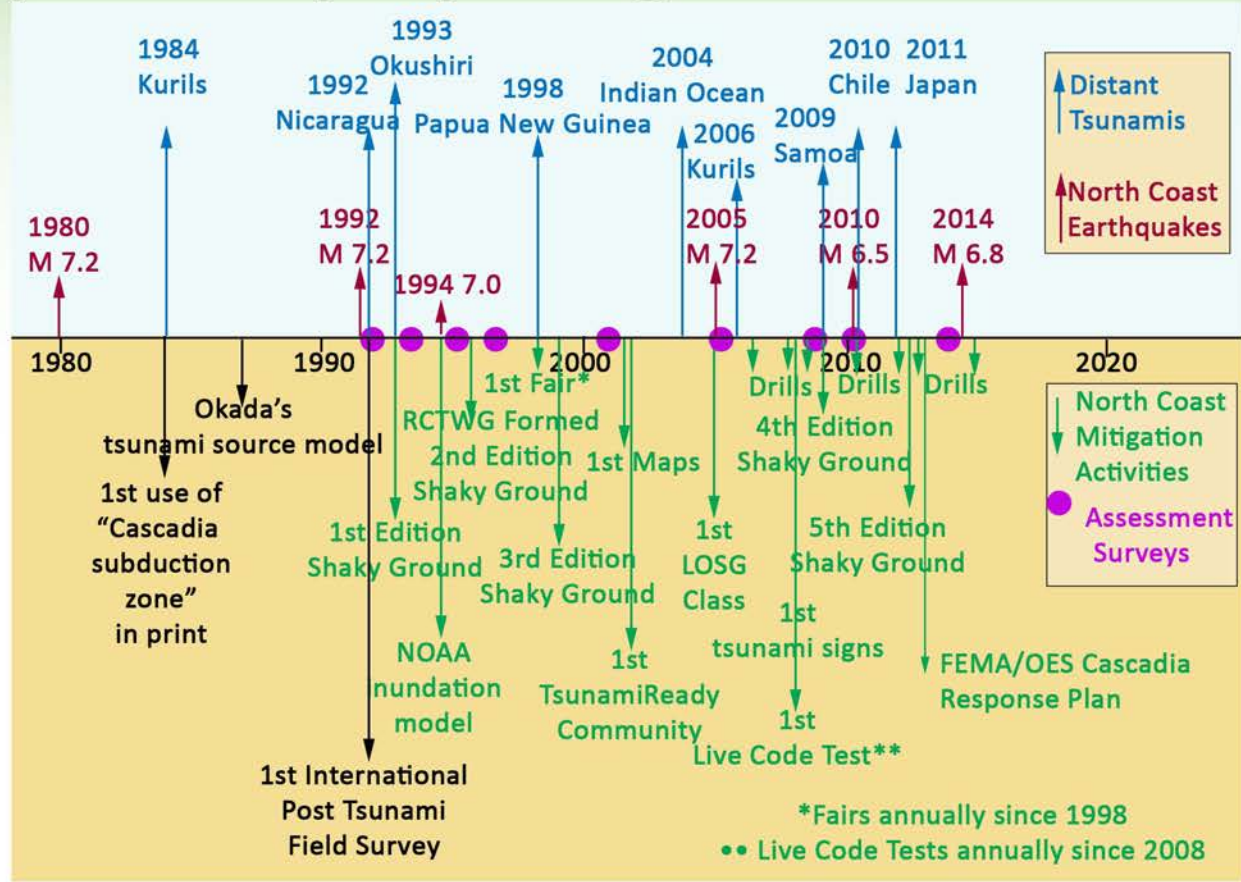


After poorly built structures, avalanches were the second cause of deaths and damage. Nepal is a steep, mountainous country and avalanches triggered by shaking overran towns and severed transportation and communication links. At least 22 people were killed at the South Base Camp on Mt. Everest.



Just as in Nepal, poorly built buildings on the North Coast are the most vulnerable to strong shaking and landslides on unstable terrain may isolate some areas for days and weeks.

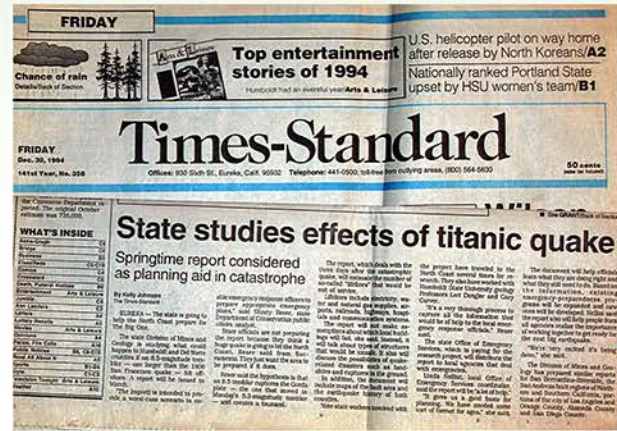
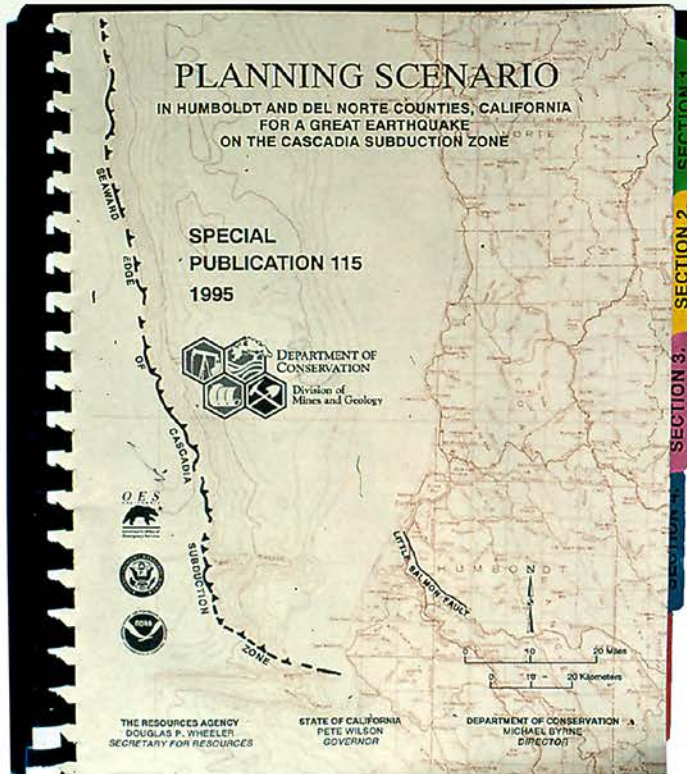
Twenty years of preparing for Cascadia Events



1995 marked the beginning of regional efforts to prepare for Cascadia earthquakes and tsunamis. We've made progress but there still is much to do.

1995 The Scenario

In March of 1995, the California Division of Mines and Geology (now the California Geological Survey) published a study of the likely effects of a great earthquake on the Cascadia subduction zone.



Twenty years ago, we recognized that a great Cascadia earthquake will produce wide spread ground shaking and a large tsunami. The 1995 Scenario was the impetus to begin regional preparedness.

Living on **SHAKY GROUND**
HOW TO SURVIVE EARTHQUAKES AND TSUNAMIS IN NORTHERN CALIFORNIA

Twenty years of preparing for Cascadia
2015 Earthquake Tsunami Room Humboldt County Fair



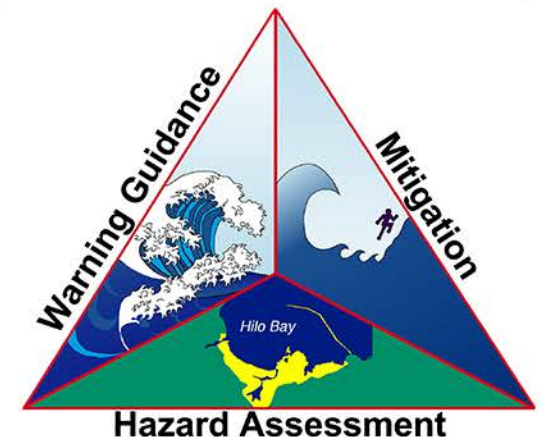
1996 Local and National Cascadia Efforts

THE REDWOOD COAST TSUNAMI WORK GROUP

In 1996, a small group of Del Norte, Humboldt and Mendocino County people from local, state and federal agencies, relief agencies, coastal land managers, and businesses met to brainstorm ideas to confront the Cascadia earthquake threat. They formed the Redwood Coast Tsunami Work Group to promote a coordinated, consistent mitigation program.

THE NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM

In 1996, representatives from Alaska, California, Hawaii, Oregon and Washington along with NOAA and the USGS launched a modest program to improve tsunami hazards assessment, warning, and mitigation. The NTHMP addressed both tsunamis generated by large earthquakes far away and nearby tsunamis such as Cascadia.

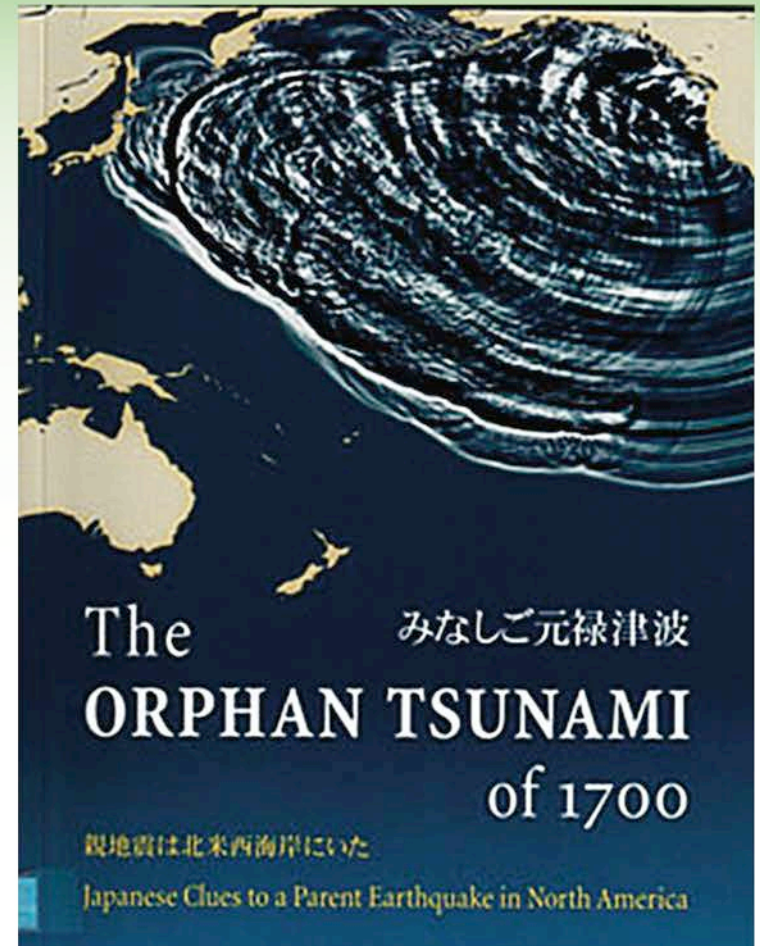


1997 The Orphan Tsunami

The first evidence of the last great Cascadia earthquake and tsunami was published in the 1980s. These first studies were of ancient tsunami deposits in Washington state and submarine landslides - called turbidites - off the coast. The dates of past events were only approximate. In the 1990s, Japanese researchers began looking for written evidence of "orphan tsunamis". Most Japanese tsunamis are caused by big earthquakes near Japan. People feel an earthquake that is soon followed by tsunami waves. Orphan tsunamis aren't preceded by ground shaking because the source is far away.



Towns in Japan with written records on the 1700 Cascadia tsunami



**An orphan tsunami struck the Pacific coast of Japan on a winter's night in 1700.
It was likely generated by a magnitude 9 Cascadia earthquake in the evening of January 26, 1700**

1998 Outreach - the message and the fair

Not very many people on the North Coast knew what a Cascadia earthquake was or the tsunami threat. The Earthquake - Tsunami Room at the Humboldt County Fair was a good place to get the word out. Our first room wasn't fancy but everyone liked the wave tank.



TSUNAMI!

HOW TO SURVIVE THIS HAZARD
ON CALIFORNIA'S NORTH COAST

IF YOU FEEL A ~~STRONG~~ ^{change to long} EARTHQUAKE
WHEN YOU ARE ON THE COAST:



1. Drop, cover and hold on and watch for falling objects until the earthquake is over.



2. Move to higher ground or inland away from the coast immediately. A tsunami may be coming. Go on foot if at all possible.



3. Stay away from the coast; do not return to shore after the first wave. Waves may continue to arrive for hours.



4. Listen to your radio for an official "all clear" before returning to the beach.

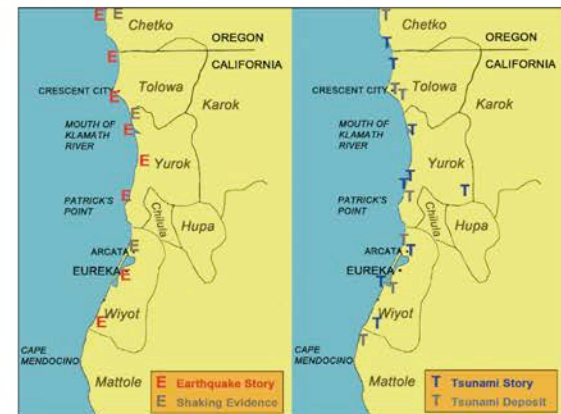
DO NOT WAIT FOR AN OFFICIAL WARNING

One change from our messages in 1998. We use the word "long" instead of "strong". We don't know how hard the ground will shake - but it will shake for a long time, probably a minute or more.

1999 Native American Oral History

Deborah Carver began collecting Yurok and Tolla earthquake and tsunami accounts in the 1980s. The following is part of a story set near the mouth of Redwood Creek told to the UC Berkeley Anthropologist Albert Kroeber by Tserkr

The Flood: There used to be a settlement just north of Orekw. An old man and his brother went into the sweathouse to sleep. But a man was outside, and when they slept, he went in and tied their hair together. Then he went out and shouted, "They are going to fight!" Then the ocean began to turn rough (from the anger of the old men). A breaker came over the settlement (of Si-witsu), washed the whole of it away, and drowned everyone. Then all the people of Orekw ran off to the top of the hill, wearing their woodpecker-crest headbands: they were afraid. He looked into the sweathouse at Oketo. He spoke to him, but that one did not answer. Four times he spoke to him. Then he said, "Were they drowned?" Yes, I saw them drown," said he of Orekw, "but I am afraid the water will cover the whole land.? And now the breakers were already dashing against one side of that sweathouse (at Oketo). He had to do it hastily; therefore he used old boards to make the fire³. Then the ocean went down.



All of the accounts that reference time of year or time of day are set at night and in winter - in agreement with the time of the last great Cascadia earthquake from Japanese stories.

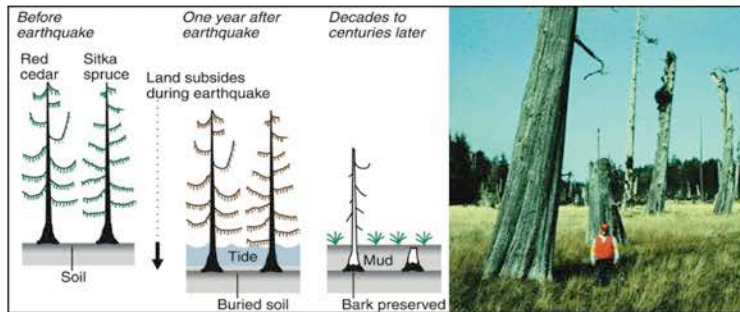
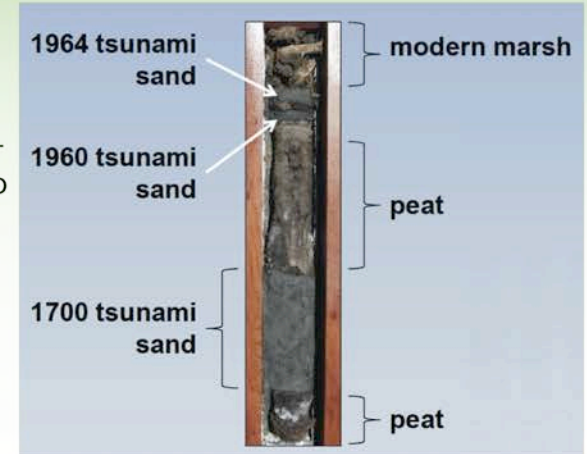
2000 The Last Cascadia Tsunami - 300 years ago

Remembering the last great Cascadia earthquake and tsunami - different lines of evidence:

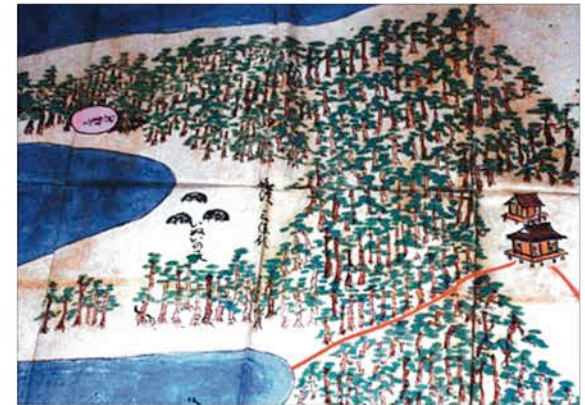


Oral history of the Yurok people tell of past earthquakes and tsunamis

Tsunami deposits: This core from Crescent City shows two historic sand layers and a much thicker sand caused by the 1700 Cascadia tsunami



Written records from Japan: Miho is one of the towns in Japan where written records describe a series of large waves but no accompanying earthquake. These records established January 26, 1700 as the date of the most recent earthquake.

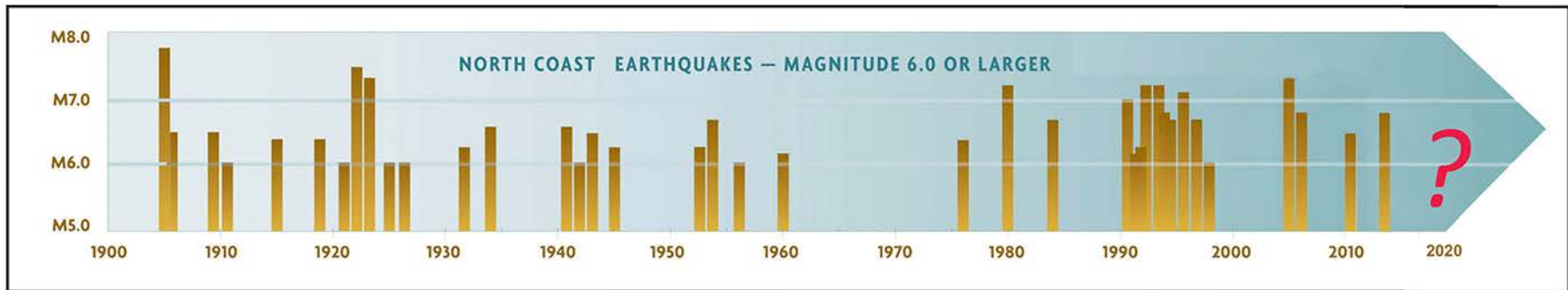


Ghost forests caused by sudden dropping of the land help to date past earthquakes

1700 is not the only great earthquake in the Cascadia region. The dates aren't as precise, but at least six other similar earthquakes have struck the North Coast in the past 3000 years.

2001 Past Earthquakes on the North Coast

The Cape Mendocino, coastal and offshore region of Humboldt and Del Norte Counties is the most seismically active area of the Continental United States. An earthquake strong enough to topple items from shelves recurs every two to three years. Earthquakes strong enough to cause structural damage recur on average every seven years and earthquakes that cause major damage about every twenty years.



1906



1954



1980



1994



The next strong North Coast earthquake will cause shaking damage. It may also cause landslides, liquefaction and surface fault rupture leading to damaged buildings and infrastructure.

2002 The 1992 Cape Mendocino EQ - 20 years ago

The April 25, 1992 magnitude 7.2 Cape Mendocino earthquake and the 6.6 and 6.7 aftershocks caused over \$60 million in damages, a small tsunami and is the only North Coast earthquake to receive a Presidential Disaster declaration. The mainshock was centered on the southern end of the Cascadia subduction zone.

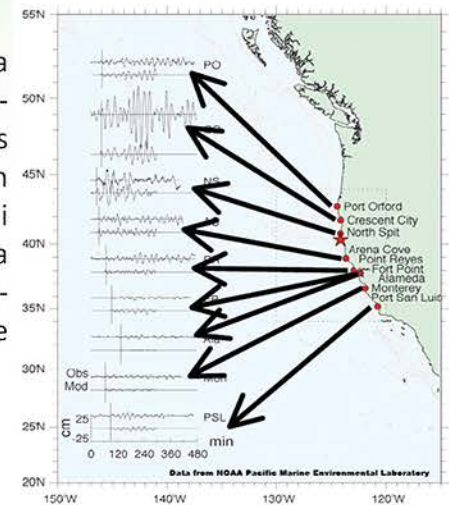


Houses off foundation



Unreinforced masonry damage

The earthquake produced a small tsunami that was recorded on nine tide gauges along the west coast and in Hawaii. The first tsunami waves were arrived about a half hour after the earthquake and lasted for more than eight hours.

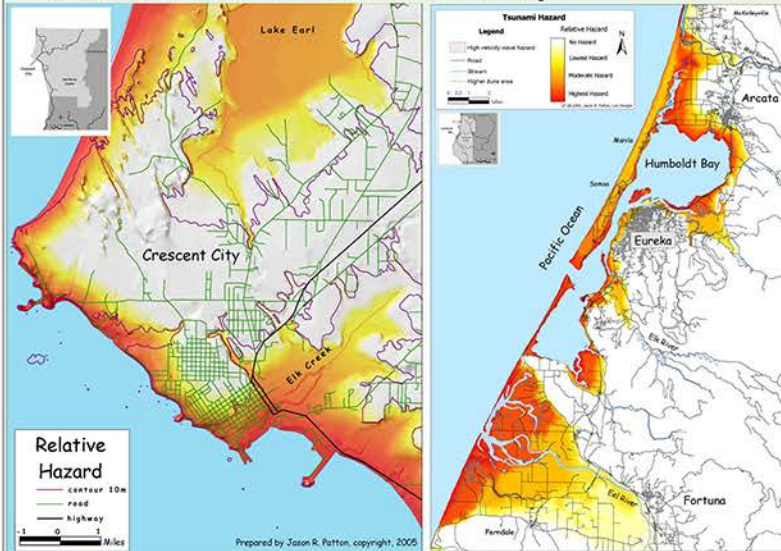


History repeats itself. The General Mercantile building in Ferndale (far left) was badly damaged in the 1906 San Francisco earthquake. The damage was nearly identical 86 years later in the 1992 earthquake when the building had become the Valley Grocery (near left). It won't happen a third time - The building has now been replaced by a wooden structure.

The Cape Mendocino earthquake changed public perception of earthquake and tsunami hazards. Concern about a larger Cascadia earthquake led to the formation of the NTHMP.

2003 First Tsunami Maps and TsunamiReady

• Relative Tsunami Hazard Maps



Maps are the basis for community planning. In order to prepare for tsunamis, we need to know what areas are safe and what areas may be at risk. In 2003, Jay Patton and Lori Dangler developed these “Relative Hazard” maps based on elevation, distance from the coast and coastal setting. The red areas are most vulnerable whereas the yellow zones would only be affected by the most extreme tsunami.

• TsunamiReady

In 2002, Crescent City became the first community in California to be recognized as “TsunamiReady” by the National Weather Service. To gain recognition, communities must demonstrate the ability to receive and disseminate tsunami warnings, and to have programs to communicate the tsunami threat. On the North Coast, TsunamiReady Communities must also have tsunami signs in place and have practiced tsunami evacuation drills.



Since 2003, more North Coast communities have gained TsunamiReady designation: Samoa and Orick in 2007, Klamath and the Yurok tribe in 2008, Redwood National and State Parks in 2009, Big Lagoon in 2010, and King Salmon in 2011. Manila will be recognized this year and Fort Bragg in 2016.

Redwood National & State Parks



Samoa

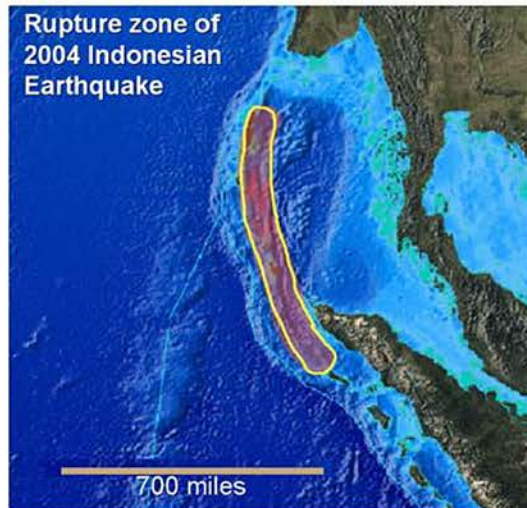


King Salmon

“TsunamiReady” is a first step toward community preparedness. But a community is not Tsunami Safe until everyone knows how to evacuate and where to go.

2004 The Indian Ocean Tsunami

The December 26 magnitude 9.1 Andaman-Sumatra earthquake produced a tsunami in the Indian Ocean that killed nearly 230,000 people in 11 countries. It was the most deadly tsunami of all times. The main causes of the high casualty numbers - lack of awareness and no Indian Ocean tsunami warning system.



Awareness and Quick Action Saves Lives

What differences do you see between the pictures of these two villages in Indonesia?
Jantang Langi



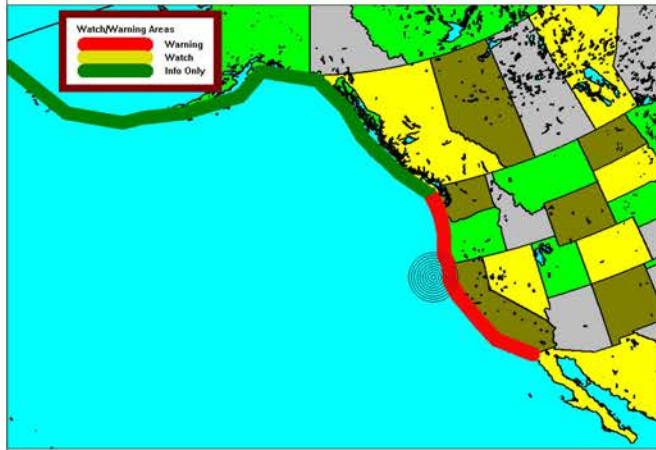
In most of Indonesian flooded areas like Jantang, people didn't evacuate and almost everyone died. There was one exception. Simeulue Island was the closest land to the earthquake epicenter. In Langi Village, the first tsunami waves arrived only eight minutes after the earthquake. But no one died in Langi. They had an oral tradition that long shaking may be followed by big waves. Everyone knew what to do - grab the children and push the elderly and disabled in garden carts up the hill and stay there.

Take a lesson from the Simeulue Islanders. If the ground shakes for a long time, head to high ground and stay there. The shaking is your warning.

2005 M 7.2 Triggers Unnecessary Evacuations

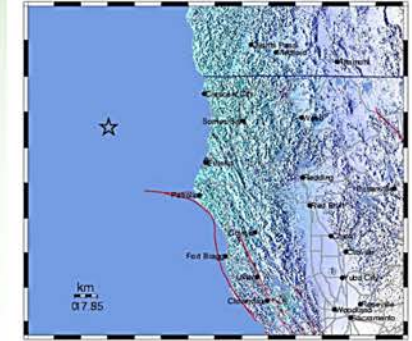
• June 14, 2005 magnitude 7.2 earthquake

An earthquake at 7:50 p.m. PDT was located about 90 miles WSW of Crescent City . The earthquake was felt lightly in much of Northern California and Southern Oregon, but caused no damage. The West Coast Alaska Tsunami Warning Center issued a Tsunami Warning six minutes after the earthquake. The protocol at the time required that all of the California, Oregon and Washington coast be placed in the warning zone.



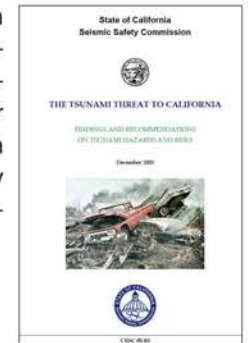
While the entire U.S. West Coast was placed in a Warning (above left), communities responded very differently locally. Some ordered evacuations while many did nothing. Crescent City was one of the communities that ordered an evacuation and people drove cars to the Hwy 101 overlook (above right). Even though Crescent City was more aware than most California coastal towns, many people used their cars and went much further than they needed to.

CISN Rapid Instrumental Intensity Map Epicenter: 156 km W of Trinidad, CA
Tue Jun 14, 2005 07:50:50 PM PDT M 7.2 N41.28 W125.98 Depth: 2.6km ID:51161167



Intensity	Fast fall	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
PERCEIVED SHAKING	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK AC (cm)	< 0.17	0.17-0.24	0.24-0.33	0.33-0.50	0.50-0.75	0.75-1.0	1.0-1.5	1.5-2.0	> 2.0
PEAK VEL (cm/s)	< 0.1	0.1-1.1	1.1-2.4	2.4-5.1	5.1-10	10-20	20-50	50-100	> 100
INTEGRATED ACCEL (m/s ²)	1	II-III	IV	V	VI	VII	VIII	IX	X

The problems in 2005 led the Tsunami Warning Centers to change their protocol. California conducted a study of the State's vulnerability to tsunamis.



FINDING: The existing tsunami warning system has not achieved all of its objectives for several reasons including problems with communications, agency coordination and protocols

**2005 demonstrated that issuing warnings is not an adequate warning SYSTEM.
If the people on the coast don't understand what it means and what to do, it won't work.**

2006 1906 Earthquake and Another Tsunami

- **The 1906 “San Francisco” Earthquake**

The so-called San Francisco earthquake ruptured more than 250 miles and caused strong ground shaking and major damage from Santa Cruz to Humboldt County. Some of the strongest shaking was in the Eel River Valley and in Southern Humboldt. It had the largest area of strong shaking of any historic North Coast earthquake. Contrary to the depiction in the movie San Andreas, at 7.8 this was about the largest magnitude the Northern San Andreas could produce.

- **November 15 magnitude 8.3 Kuril tsunami**

The tsunami warning system detected this earthquake and canceled a tsunami alert message at 6:49 a.m., a little over three hours after the earthquake. At 1 p.m. in the afternoon, strong surges arrived in Crescent City, destroying a third of the docks, damaging several boats and causing over \$20 million in damages. As a result, the tsunami warning centers changed the definition of a tsunami advisory to mean the potential for strong currents.



Pythian Castle in Ferndale



1906 damage and felt zones

TSUNAMI HITS CRESCENT CITY



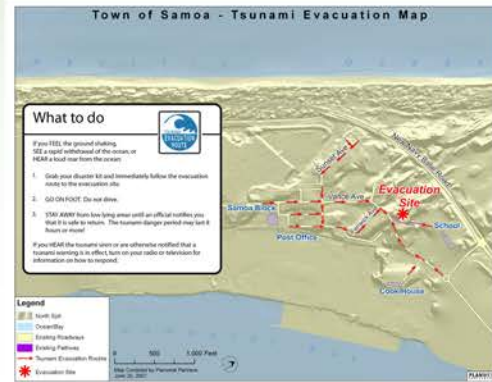
- ♦ WAVES SURGE INTO HARBOR
- ♦ BOATS, DOCKS DAMAGED



Take a lesson from the Simeulue Islanders. If the ground shakes for a long time, head to high ground and stay there. The shaking is your warning.

2007 First North Coast Evacuation Drill

Samoa conducts first California Tsunami Evacuation Drill in June 2007



Samoa made history when it conducted the state's first full scale community evacuation drill. The drill was preceded by a community meeting and door to door contact with community members so that no one would confuse the drill with a real event. Since 2007, a number of North Coast communities have held evacuation drills. Samoa conducted a second drill in the summer of 2015. Some of the drills are shown below. Include your pets in the drill if you are able - dogs on leashes and cats in carriers, iguanas on shoulders.



Trinidad School 2008



Fairhaven 2010



Klamath 2009



Crescent City 2010



Manila 2013



King Salmon 2012

Drills are essential to developing tsunami resilient communities.

Drills provide the muscle memory to do the right thing before a real tsunami arrives.

2008 First “Live Code” Tsunami Test

Tsunami Communications Test March 2008

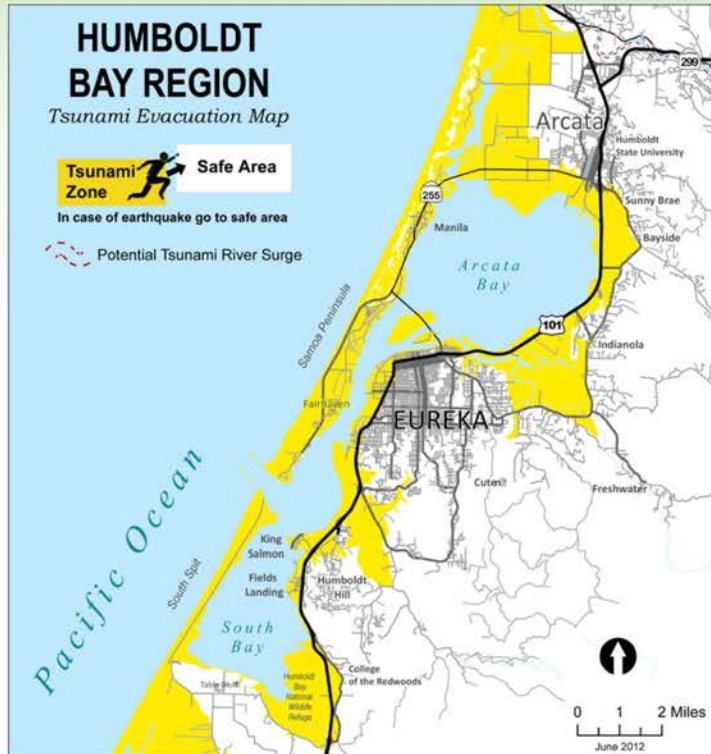
What’s the big deal about a tsunami test? It seems like the Emergency Alert System is being tested all the time. The weekly test notifications that interrupt your radio program or scroll across your television are just that - tests. They don’t use the same codes or pathways that a real emergency alert would use. In March 2008, Humboldt County took the big step to test the real “live codes” as if a real tsunami warning had been issued. There is danger in doing this - we had to make sure that no one was confused and thought that the test was the real thing. This means lots of outreach and education. It was a success. In 2009, the test was expanded to Del Norte County and in 2010 Mendocino joined as well. The North Coast has continued to conduct tests every year since then - except in 2011 when a real tsunami arrived a week before the scheduled test.

Each year the test has added something new such as sirens, civil air patrol flyovers and reverse calling.

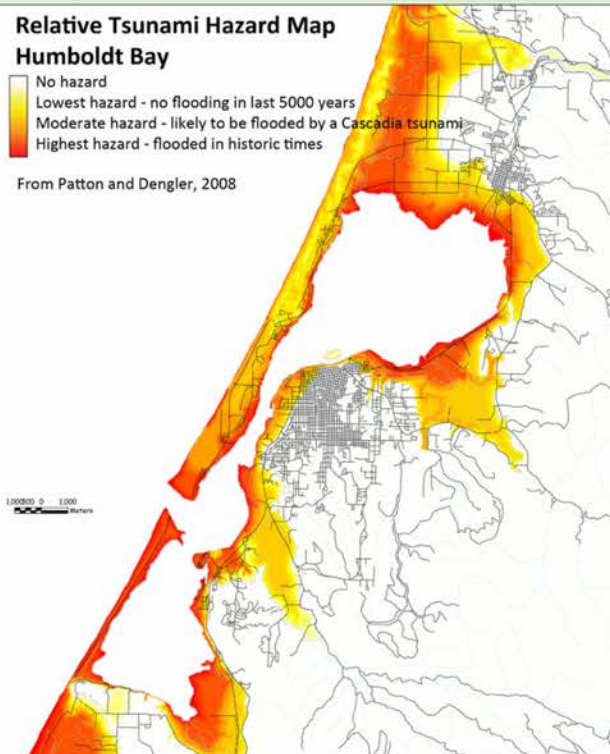


**The tsunami warning system is designed to alert you about tsunamis coming from far away.
If the source of the tsunami is nearby, you will feel the earthquake and the shaking is your warning.**

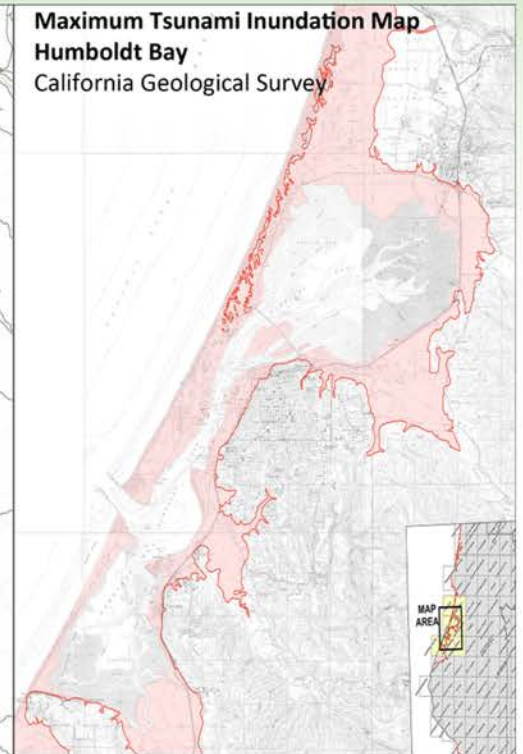
2009 Evacuation Maps



Tsunami Evacuation Map: This shows areas that are safe (white) and areas that may be at risk (yellow) for a magnitude 9 earthquake on the Cascadia subduction zone, the worst tsunami likely to hit our area. The boundary between the yellow and the white areas usually corresponds to street and other geographic boundaries to make it easy to remember. It does not show where the water goes.



Relative Tsunami Hazard Map: This map illustrates that small areas are more likely than big ones and that the areas at low elevation near the coast and around the bay will be flooded more frequently than areas further inland. There is no evidence that the pale yellow areas have been flooded in the past 5000 years.



Tsunami Inundation Map: The red areas on the map are from numerical modeling for the greatest inundation for our area - from the tsunami caused by a magnitude 9 earthquake on the Cascadia subduction zone. It represents where the water will reach for a model run.

**If you live, work or play in a yellow area, know the best way to get to a white "safe area".
Plan to go on foot as roads may be impassable.**

2010 Earthquakes Near and Far

• January 9 Offshore Eureka M 6.5

Saturday 4:27 p.m. ~\$20 million damages

The most recent damaging North Coast earthquake was typical of earthquakes in the Gorda plate. It was centered on a strike-slip fault 29 miles west of Eureka. Eureka was the most heavily damaged area. Most of the damage was minor such as broken windows and cracks in plaster. Almost 100 chimneys were damaged in the Eureka area. Some damage to structures also occurred in Ferndale, Loleta, and Fields Landing. Many Ferndale structures were strengthened after the 1992 earthquakes and had very little damage.



• February 27 Chile M 8.7

Saturday 3:34 AM

521 people killed, 56 missing, (124 attributed to the tsunami) 370,000 homes destroyed, \$30 billion in losses (30% gdp)

12.5 million people experienced very strong ground shaking (intensity VII or greater), four times as many as in Haiti. Robust building codes and a high level of tsunami awareness contributed to the relatively low loss of life considering the size of the earthquake.



• January 13 Haiti M 7.0

Tuesday 4:53 PM Local time, 222,570 people killed, 300,000 injured, 1.3 million displaced 97,294 houses destroyed & 188,383 damaged, At least \$2-3 billion in losses (30 - 50% gdp) No surprise as to why the Haiti quake was so deadly. There was nothing unusual about the earthquake shaking except it was concentrated in a city of poorly built structures and no code enforcement. Some buildings had been built to standards similar to those in California and they withstood the shaking with little or no damage. But most buildings had no strengthening to resist earthquakes and the quality of construction materials was poor.



Bad buildings kill.

2011 Impacts of the Japan Tsunami in California

The first tsunami surges arrived on the Northern California Coast more than nine hours after the earthquake

- A Tsunami Warning was issued for the California coast about three hours after the earthquake and six hours before the first surges arrived.
- An Warning means that there is a significant danger of flooding on dry land.

A man died at the mouth of the Klamath because he ignored warnings and wanted to photograph the tsunami. The tsunami caused over \$50 million in damages in California



Crescent City Harbor during the tsunami.



The tsunami hitting Santa Cruz harbor.



The damage at Crescent City.



The tsunami entering the mouth of the Noyo River.

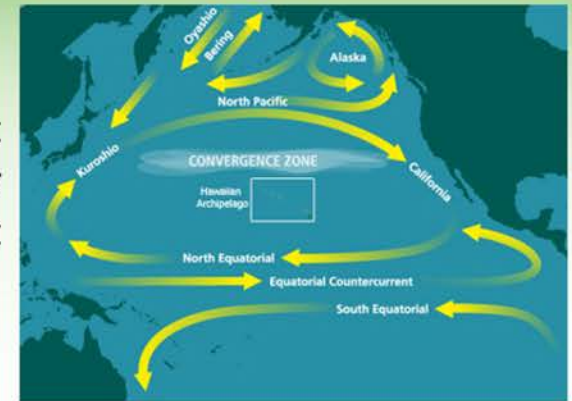


Crescent City's harbor was rebuilt. The new piers will withstand a repeat of 2011. They won't survive a Cascadia tsunami.

A Cascadia tsunami will take the same amount of time to travel to Japan. It will cause similar effects in Japan as the 2011 tsunami did in California.

2012 First Tsunami Debris Arrives

The 2011 Japan tsunami left a long lasting legacy, not only in Japan, but elsewhere in the Pacific. 1.5 million tons of debris were swept far enough offshore to be caught in the Northern Pacific Gyre, the great current that slowly moves clock wise in the Northern Pacific.



Montague Island, Alaska.



British Columbia.



Washington.



Oregon.



British Columbia.

The tsunami likely contributed less than 7% of the total debris in the Northern Pacific. Other human sources are larger contributors to the Pacific Garbage Patch

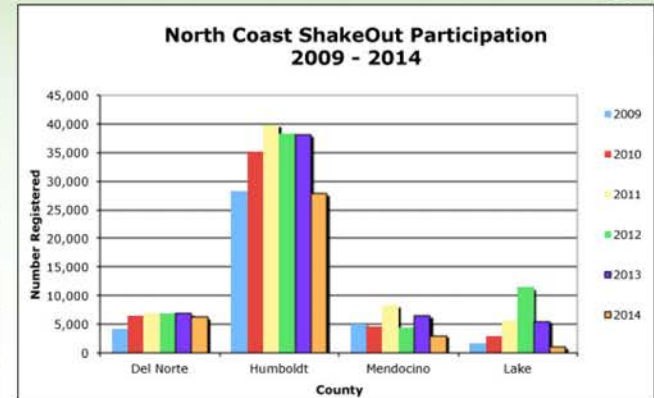
2013 Red Table, ShakeOut and Cascadia Planning

• California's Moving Red Table comes to the Fair

The Red Table has been up and down California. In 2013 it made a three-day stop at the fair. The Red Table was made to promote Drop - Cover - Hold On during earthquakes and to promote the Great ShakeOut, held statewide every year since 2009. Each year ShakeOut participation has grown. In 2014, over 10 million Californians participated.



Lori Dengler and HSU President Rollin Richmond under the table in 2013.



The Earthquake-Tsunami Room receives the Fair's 2013 gold award for best non-profit exhibit.

In 2013, the Federal Emergency Management Agency and the California Office of Emergency Services completed a Response Plan for a great earthquake and tsunami on the Cascadia subduction zone. The plan outlines likely impacts of a magnitude 9 earthquake and a framework for coordinating response and relief.



California Cascadia Subduction Zone Earthquake and Tsunami Response Plan

US Department of Homeland Security
Federal Emergency Management Agency Region IX
California Governor's Office of Emergency Services
September 2013



The 2015 ShakeOut is at 10:15 a.m. on October 15.
Register to participate at shakeout.org

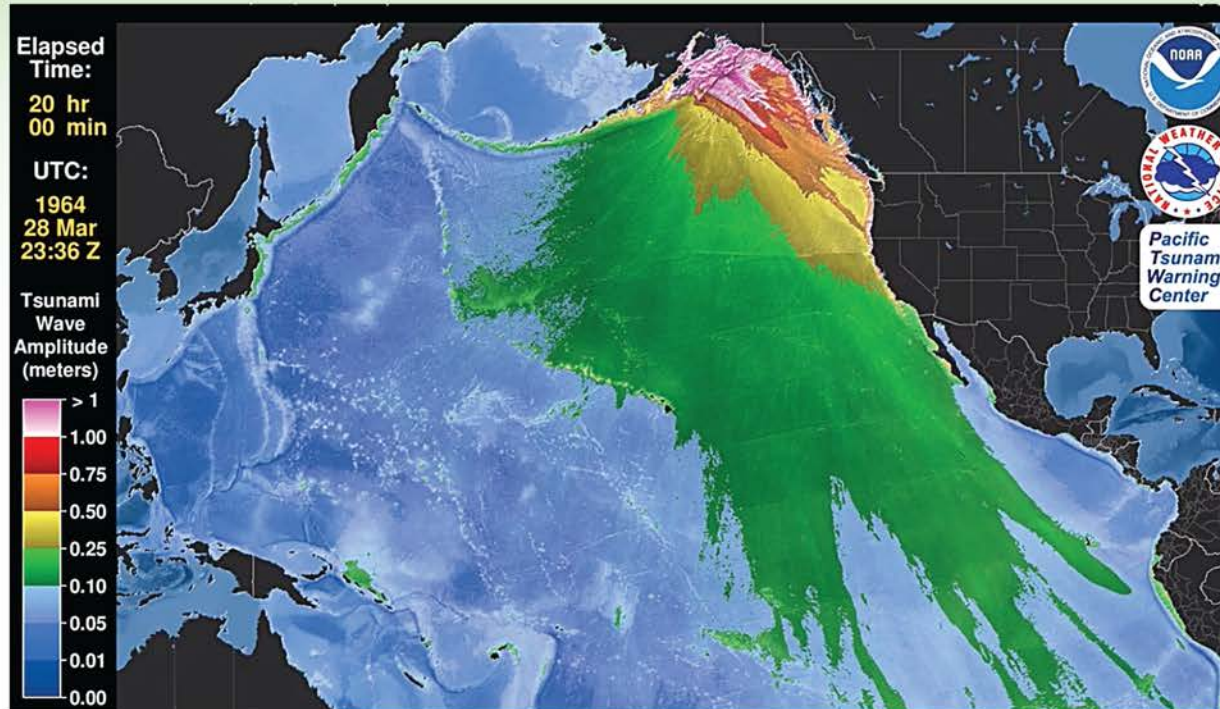


Twenty years of preparing for Cascadia
2015 Earthquake Tsunami Room Humboldt County Fair



Redwood Coast
Tsunami Work Group

2014 Fifty Years Ago-the Great Alaska Earthquake



The earthquake produced a tsunami that caused damage along the entire Pacific Northwest Coast. It was the second worst historic natural disaster for North Coast California - only the Christmas floods of 1964 killed more people. It took three hours for a tsunami warning to be issued to Crescent City. If the same earthquake happened today, the warning would come out in less than four minutes.

It's only a matter of time before a similar event will strike again

Thank You

What you see in this room is a result of the efforts of the Redwood Coast Tsunami Work Group (RCTWG), an organization of local, state and federal agencies, tribes, relief and service groups, land managers, and businesses from Del Norte, Humboldt and Mendocino Counties. The group was formed in July 1996 to define the needs of local jurisdictions to mitigate the North Coast earthquake and tsunami hazard and to promote a coordinated, consistent mitigation program for all coastal areas. The RCTWG is part of the California Earthquake Alliance, a state organization of regional work groups that foster preparedness throughout the state.

Special thanks our Earthquake – Tsunami Room Volunteers from:

NOAA/National Weather Service – Eureka Forecast Office

California Geological Survey

California State Parks

Cascadia GeoSciences

Humboldt County Public Works

Humboldt State University/Geology Department

Humboldt State University/CERT

Redwood State and National Parks

Pacific Watershed Associates

Redwood Coast Tsunami Work Group

U.S. Geological Survey