

## Tsunami Messaging Project

### NOTES FROM TSUNAMI MESSAGING WEBINAR OF 05/29/2014

Participants on this webinar are listed at the bottom of this page.

These are notes following the webinar-enabled discussion held May 29, 2014, about felt earthquakes at the beach, the "20 second rule" and the science behind the "earthquake - leave the beach" message.

*Note: see some relevant articles that inform this information are linked at the bottom of this page.*

### History of "the 20-second rule"

Paul Whitmore reported the history of the origin of the message related to a natural cue that if you feel a sustained shake of an earthquake for 20 seconds or more to leave the beach because a tsunami may arrive soon. Paul tried to poll some of the TWC staff who predated his 1986 arrival there, but has not received a response yet. He said that the message had been around for a long, long time but could not pinpoint where it came from or when the message was first introduced.

However, he said that shaking a long time means that there is a larger fault rupture. Shaking hard means that the earthquake source is nearby.

Gerard Fryer of the PTWC said that 20 seconds came from possibility of slow earthquakes. He said that the official term is "tsunami earthquake" - slower than usual earthquake. These earthquakes last a long time. These long-lasting (long-felt) earthquakes will produce a tsunami.

Lori Dengler stated that when she was involved in writing and reviewing the first *Living on Shaky Ground* document in 1993, she had seen the 20 second message already out there. Rocky Lopes was also involved with that project at that time (when he was at the Red Cross HQ) and affirmed Lori's recollection.

### The science behind the messaging

Lori Dengler: It takes longer to rupture a long fault than it takes to rupture a short fault. The long fault earthquakes are more likely to produce a tsunami. The higher the number of seconds one feels (or counts) for an earthquake, the longer the fault the more likely you will get a tsunami. Big faults have more slip thus the more tsunami-generating potential.

### The phenomenon of "the felt earthquake" and geographic differences

Lori Dengler stated that in Northern California, there are a lot of felt earthquakes and that it was important in their setting that people should not be told to go to high ground if they feel any earthquake. Would result in unnecessary evacuation.

The nuanced change of this message is to leave the beach - If on the beach, and you feel an earthquake no matter how small, get off the beach and find out what is going on. For ANY felt

earthquake. (NorCal has a large evacuation zone.)

Jeff Lorens: if on the beach, if feel shaking, get off the beach. (Should be easy for people to do.)

Rocky Lopes pointed out that "leave the beach" does not mean the same thing as "evacuate in case of a tsunami" (such as by going to high ground or a designated tsunami evacuation assembly area.)

John Schelling: more frequent earthquakes in California and Alaska makes the message important geographically. But in Washington without frequent earthquakes at the beach, "shaking = run."

John confirmed that a slow earthquake is an issue. If we become too precise with our adjectives to describe shaking, we are often later proven wrong. The Nisqually earthquake of 2001 lasted 17 seconds, but reports from people showed wide variability in reported length of the earthquake.

Rocky brought up "time warping" - validated why people report differently about length of a felt earthquake.

John Schelling: "You may evacuate more times than a tsunami will come. Good for you. You know where your evacuation route is and good for you to practice."

Sue Perry: jury is still out about whether there is a "false alarm effect." It can be mitigated that after someone evacuates, affirm positively that the practice is a good thing. The science isn't wrong even though a tsunami didn't happen that time.

Lori Dengler: geographic area concern - that in NorCal in 2014, they already would have evacuated 5 times this year. Better to call it an "unnecessary evacuation" rather than a "false alarm."

John Schelling: Important to tie tsunami together with the earthquake piece. They are related events, not "just" tsunami. This is important when considering doing The Great ShakeOut with tsunami walkout drills.

## **Discussion about "20 Seconds"**

Counting while ground is shaking has other benefits besides determining duration of an earthquake.

Help to distinguish between normal run-of-the-mill earthquake from a tsunami-producing earthquake.

Sue Perry: before she was involved in earthquakes, she had difficulty counting accurately. She shared concerns about people using the counting to make a good decision.

The intent of the 20-second rule is black-and-white. It gives them something simple to react to. Simple guidance.

Lori Dengler: stayed with 20 seconds - this errs on the conservative side. Not all quakes at 20 seconds will produce a tsunami. Agree with "let's not fixate on 20 seconds."

Once you go over 20, then the impression is that an earthquake has lasted a long time. Giving tools to make decisions in absence of official warnings (without anyone telling you.)

It's okay if you want to evacuate each time you feel an earthquake, that's fine (as long as it doesn't require getting in your car.) Fixating on 20 seconds is where you get into trouble.

## Long vs. Strong Earthquake

Lori Dengler: we do not say “strong shaking” any more. We emphasize earthquake duration. A Cascadia event could be slow. We don't know.

Gerard Fryer: agree – don't use term “strong” shaking.

Lori Dengler: if it is a strong earthquake, people will notice. Issue is that it does not have to be strong. It is the long duration earthquake that is an issue and could likely produce a near-source tsunami.

Long is the emphasis rather than the strong.

John Schelling: The bigger the earthquake, the longer the shaking lasts.

Sue Perry: Counting doesn't deal with exceptions – for example, sometimes the quake sends energy in direction that you aren't, or you don't know how an earthquake feels.

Kevin Miller: trying to get people to think more about “long” rather than a specific number of seconds.

## Protective Actions

Lori Dengler/John Schelling: in The Great ShakeOut – we mean “drop, cover, hold on, then run.” Not “shake and run.” If only people understood how a tsunami is produced, they would evacuate earlier (rather than engage in validation and verification).

Term “run” – emphasize “walk,” not run. If people think they have to run, it may affect older people's perceptions of being able to physically do that.

When seconds count – move as fast as they can (physically able) to (safe place).

Lori Dengler: “As soon as you feel that you can safely move, then evacuate.” (This demonstrates modification to message.)

If you live/work in a tsunamizone, it is important to have methods to get messages to notify you what is going on. Twitter feed (example.) Kevin Miller emphasized that this is very important.

## Outcome from discussion

Because it takes longer to rupture a long fault than it takes to rupture a short fault and long fault earthquakes are more likely to produce a tsunami–

**If you are on the beach and feel shaking of an earthquake, get off the beach and find out whether you need to keep going and move to a tsunami-safe location.**

*Note: the message above may need to be adjusted for readability, but the main points are–*

- a. if on the beach and feel earthquake shaking, leave the beach*
- b. find out more information*
- c. go to a tsunami-safe area if additional info indicates you need to do so*
- d. we should no longer say to count for 20 seconds.*

## Articles and Publications related to this topic

Backgrounder from Lori Dengler – article in the Time-Standard/Humboldt Beacon of March 9, 2014  
[Quite a great reminder: When in doubt, drill it out](#)

Informative research: Bulletin of the Psychonomic Society, 1989  
[Estimating the duration of an earthquake: Some shaky field observations](#)

Seismological Research Letters (SSA) March/April 2014.  
[How Observer Conditions Impact Earthquake Perception](#)

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05/29/2014 webinar participants

Amanda Admire Arcata CA Humboldt State University  
Nick Arcos Honolulu HI International Tsunami Information Center  
Lori Dengler Arcata CA Humboldt State University  
Gerard Fryer Honolulu HI NWS Pacific Tsunami Warning Center  
Donna Hughes Crescent City CA Redwood Coast Tsunami Work Group  
Jennifer Lewis Silver Spring MD NWS HQ International Affairs  
Jeff Lorens Salt Lake City UT NWS Western Region HQ  
Rocky Lopes Silver Spring MD NWS HQ Tsunami Program  
Royal McCarthy Eureka CA CalTrans  
Kevin Miller San Francisco CA California OES  
Sue Perry Pasadena CA U.S. Geological Survey  
Erv Petty Anchorage AK Alaska DHSEM  
Christa Rabenold Silver Spring MD NWS HQ Tsunami Program  
John Schelling Camp Murray WA Washington Emergency Management  
Seismic Network Mayaguez PR University of Puerto Rico  
Jeannette Sutton Colorado Springs CO Univ. of Colorado at CO Springs  
Judith Warren Bend OR (RCTWG ??)  
Paul Whitmore Palmer AK National Tsunami Warning Center

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