

# Tsunami!

## Are you Prepared?

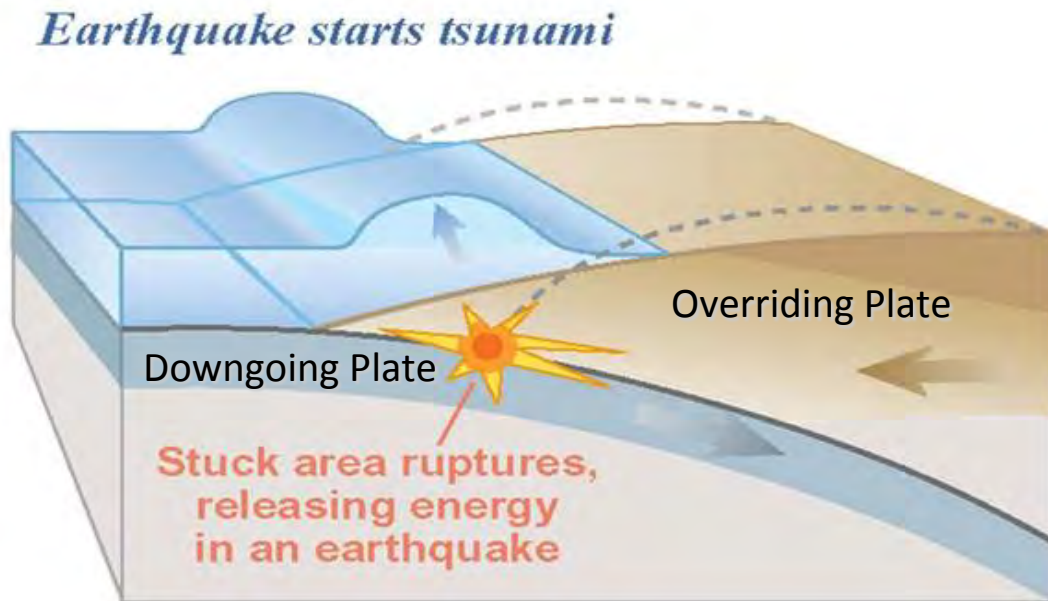


"I'll never get a shot like this again!"

# Tsunami!



# Local Tsunami from Cascadia Earthquake





*How do we know?*

Evidence of Cascadia  
earthquakes:  
Land-level changes

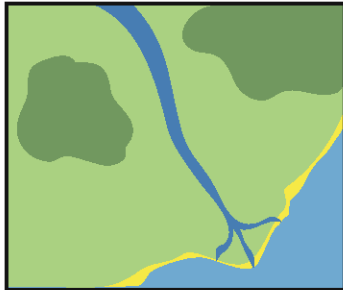
Dead forest along the Copalis river in  
western Washington.



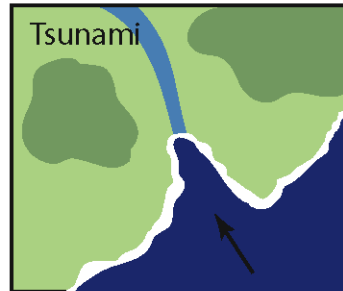
# How do we know?

## Evidence of past tsunamis: Sand deposits

Time series: Aerial view



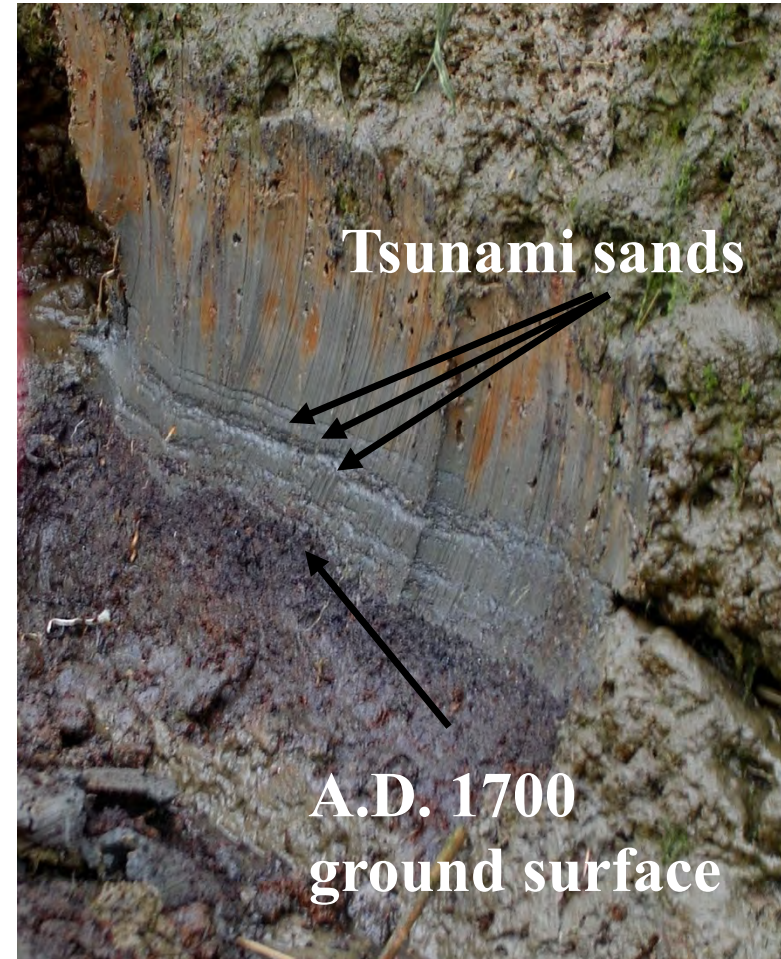
Before tsunami



Tsunami inundates  
land and goes  
upstream

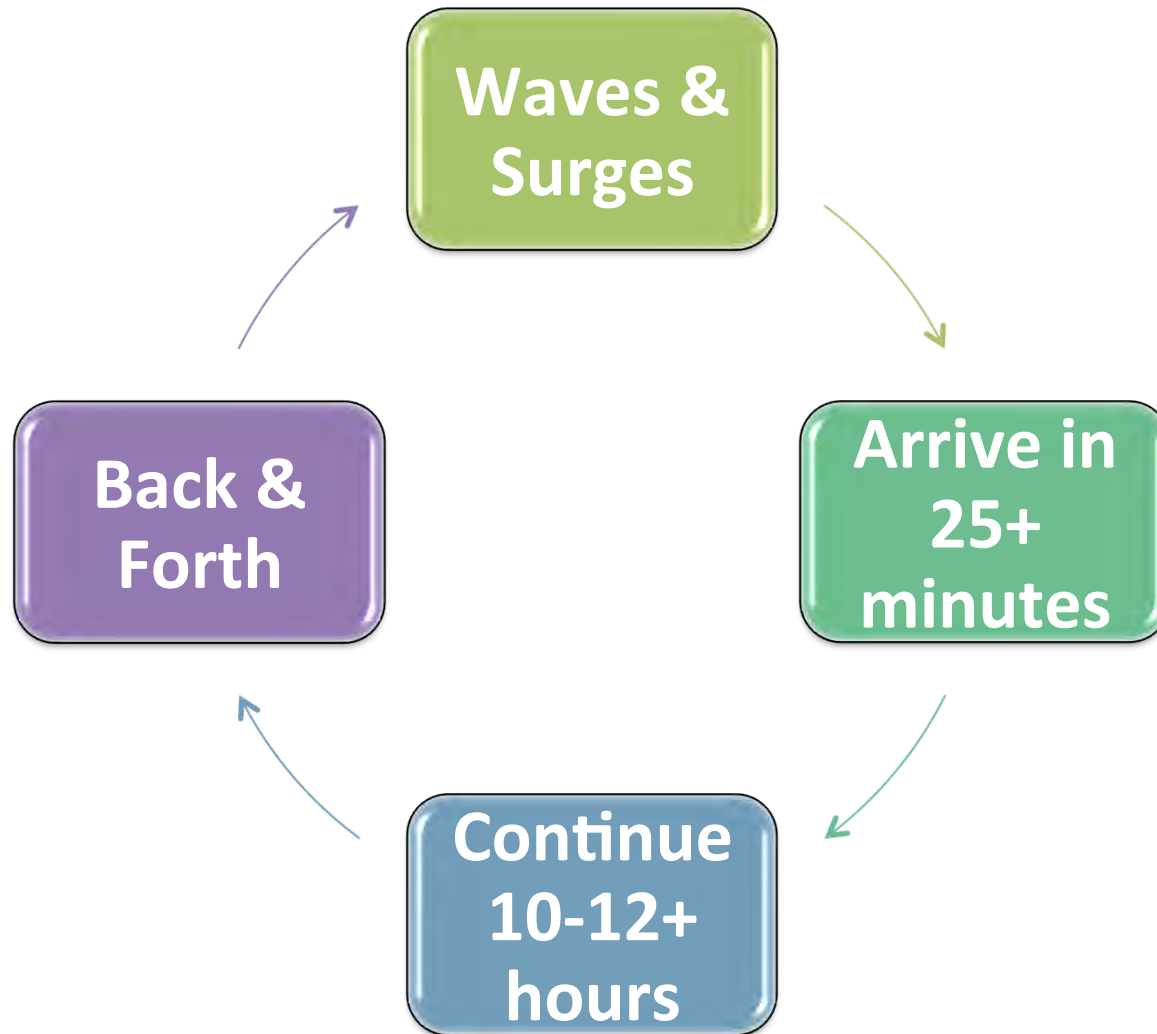


Sand deposits left  
by tsunami



*Subsided marsh along the Niawiakum River, southwest Washington*

# Local (Cascadia) Tsunami



# The Destructive Surge





# Fires



# Debris



## Inundation of coastal communities with strong currents



## Buildings Destroyed





# Communication Outages



# How will the community be notified?

- Natural cues are the warning notification!
  - **What are the Natural cues?**
- **Your Actions:**
  - Drop, Cover and Hold – Head to high ground
    - ✓ Do not Drive – **WALK!**

# Weather Information...When YOU Need It.

# **NOAA Weather Radio**



- 7 Day Forecast
- Watches/Warnings/Advisories
- Hourly Weather Conditions
- Climate and River Information
- Warnings broadcast 24 hours/Day
- Used to Activate EAS for Weather Events that are life threatening



<http://weather.gov/nwr>





# Scheduled Tests

- ❖ Weekly - Wednesdays (11am – Noon)
- ❖ Monthly
- ❖ Annually - in coordination with the Emergency Alert System (EAS) committee.

# Weather/Hydrologic Warning Levels

- ▶ **Warning:** A warning is issued when a hazardous weather or hydrologic event is occurring, imminent or likely. A warning means weather conditions pose a threat to life or property. People in the path of the storm need to take protective action.

You need to take protective action!  
Poses a threat to life or property.

- ▶ **Watch:** A watch is used when the risk of a hazardous weather or hydrologic event has increased significantly, but its occurrence, location or timing is still uncertain.

Have a plan of action and listen for more information.

- ▶ **Advisory:** An advisory is issued when a hazardous weather or hydrologic event is occurring, imminent or likely. Advisories are for less serious conditions than warnings.

Could lead to situations that may threaten life or property.

# Tsunami Warning Levels

**Warning** – Initially based solely on seismic data, are issued as quickly as possible indicating that a significant inundation may occur.

**Advisory** – Indicates potential beach and harbor danger; significant widespread inundation is not expected.

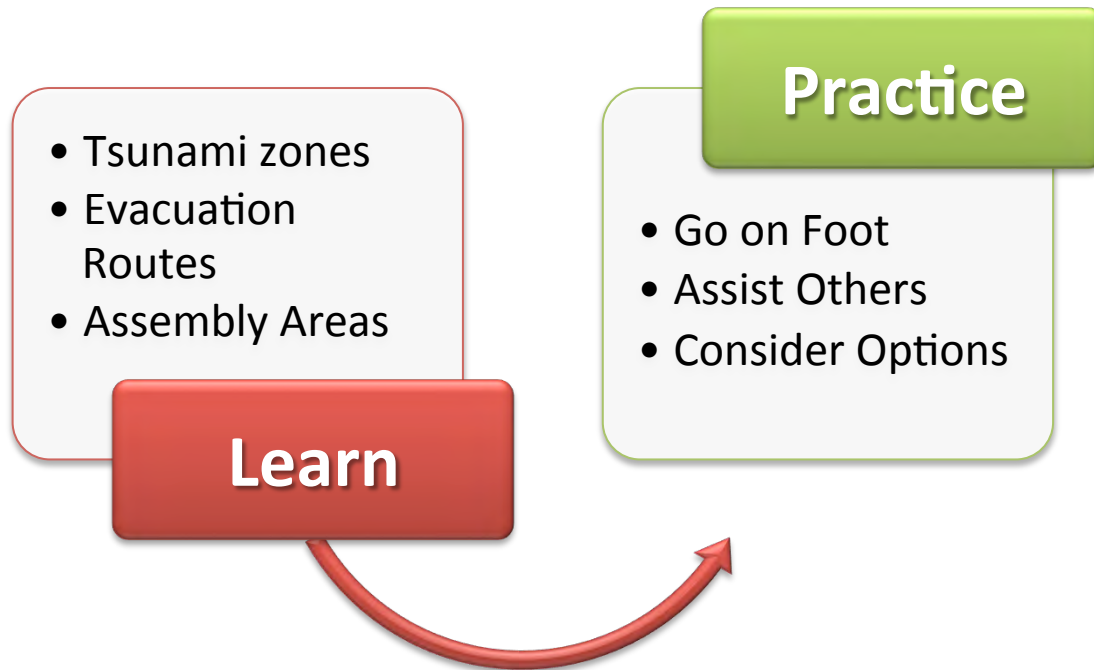
**Watch** – Tells communities that a potentially dangerous distant event has occurred and to be alert for more information.

**Information Statement** – Issued to reassure those experiencing an earthquake that conditions do not warrant tsunami generation.





# Escape the Tsunami



This map illustrates the coastal region of Grays Harbor, Washington, highlighting tsunami hazard areas and evacuation routes. The map includes the following features:

- Legend:**
  - Assembly area:** Indicated by a red circle with a white 'A'.
  - Police station:** Indicated by a black star.
  - Fire station:** Indicated by a black fire truck icon.
  - Hospital:** Indicated by a black 'H'.
  - Tsunami hazard area:** Shaded in yellow.
  - Driving evacuation route:** Solid red line.
  - Walking evacuation route:** Red line with cross-ticks.
- Geographic Features:**
  - Coastal Area:** Grays Harbor, Pacific Coast Scenic Bay, Chehalis River.
  - Major Roads:** Highway 101, Highway 109, Highway 12, Highway 105.
  - Key Locations:** Hoquiam, East Hoquiam, Aberdeen, South Aberdeen, Beacon Hill, Sunset Memorial Cemetery, Fern Hill Cemetery, Hood Park, Sam Benn Park, Wishkah.
  - Infrastructure:** Hoquiam High School, Sunset Memorial Cemetery, Beacon Hill, Hood Park, Sam Benn Park, Wishkah.
- Scale and Orientation:**
  - Scale:** 0 to 1 mile.
  - Orientation:** North arrow pointing upwards.

# Local Event – WALK!





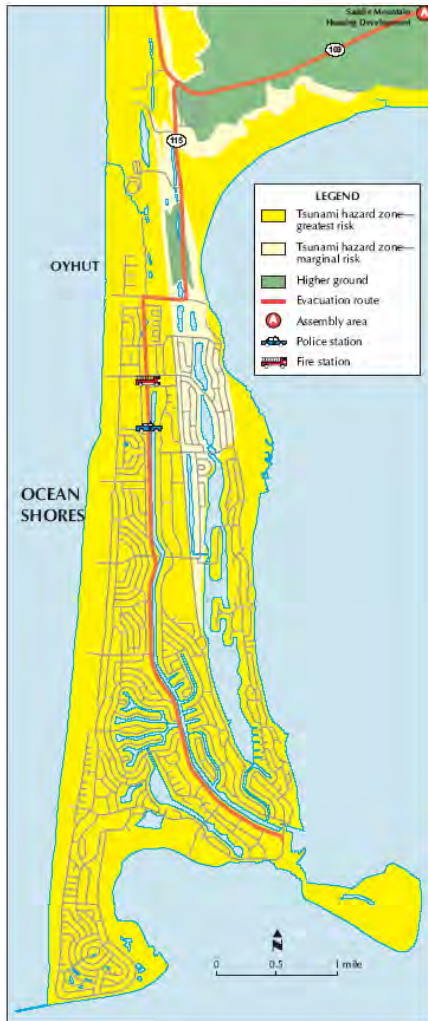
# Don't Give Up!

## Issues:

- No high ground exists
- No time to go inland to high ground
- Special needs populations

## Solutions:

- Vertical evacuation
- Vertical evacuation refuge



# Identify High Ground



- Signs
- Evacuation Routes
- Safe Areas
  - Assembly Areas
  - Vertical Evacuation Options

**Don't forget to grab your emergency kit**

# Practice



**Go On Foot**



**Assist  
Others**



**Consider  
Options**

**The Discipline to STAY PUT!**

**WHEN DO YOU RETURN  
to the  
Tsunami Hazard Zone?**



# Cancellation versus All-Clear

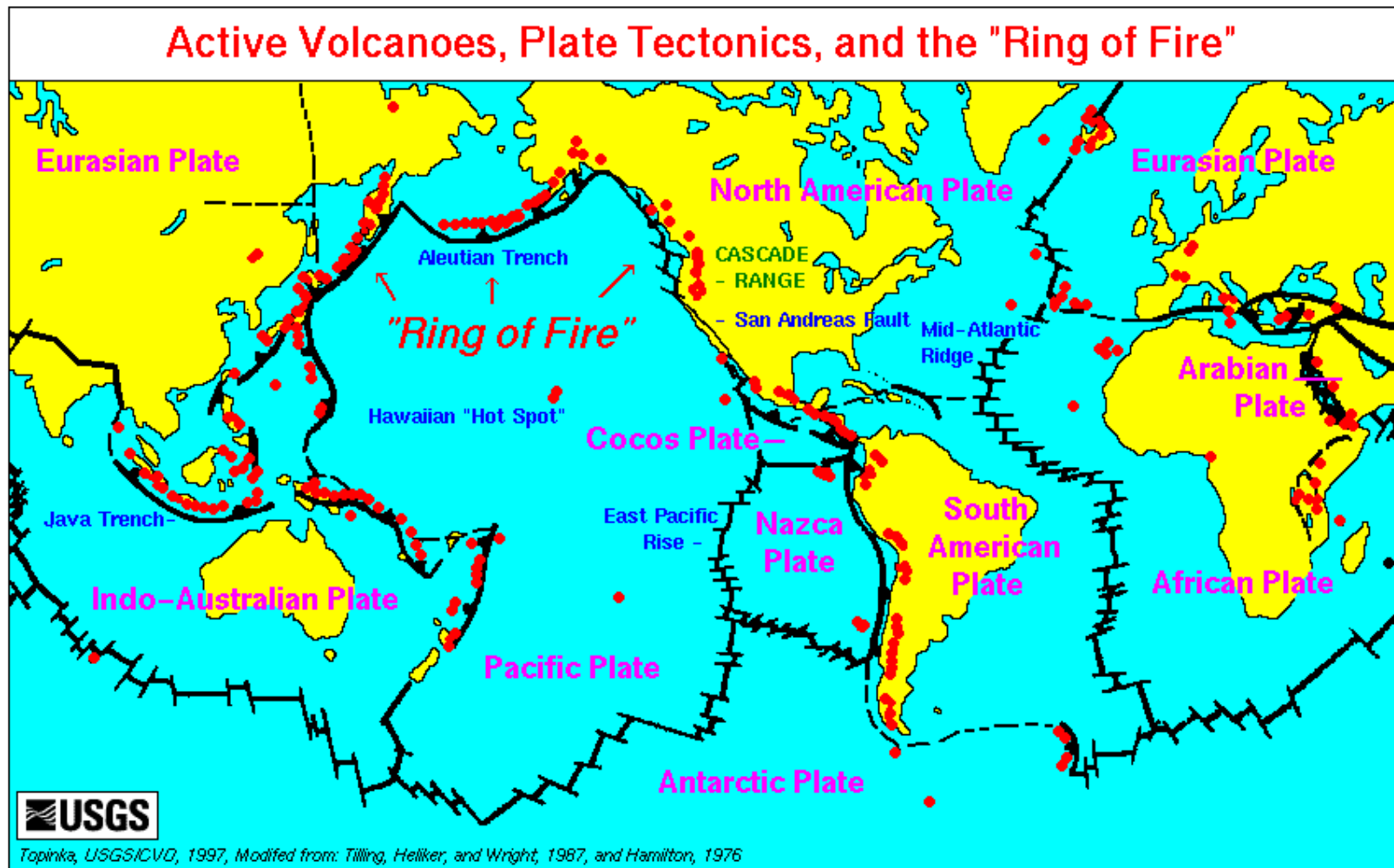
## Cancellation Message

- Issued by TWCs
- Cancels warning, watch, and advisory messages
- Means that destructive waves have stopped
- Does NOT mean it is safe to return to Tsunami Hazard Zone

# All-Clear

- Issued by **LOCAL AUTHORITY**
- Issued when it is SAFE to re-enter the Tsunami Hazard Zone

# Washington's Distant Tsunami Hazard Source



***Due to the various tsunami sources along the "Ring of Fire", distant source tsunamis are more frequent than local source tsunamis.***

# TSUNAMI ALERTS

[www.emd.wa.gov](http://www.emd.wa.gov)



## **Warning**

- **Danger!**
- **Run to higher ground.**
- **Follow emergency instructions.**



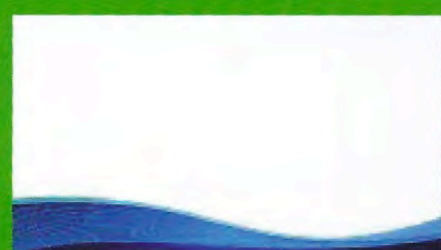
## **Advisory**

- **Possible strong and dangerous currents.**
- **Be prepared to take action.**



## **Watch**

- **Potential danger.**
- **Be alert, listen to your radio.**

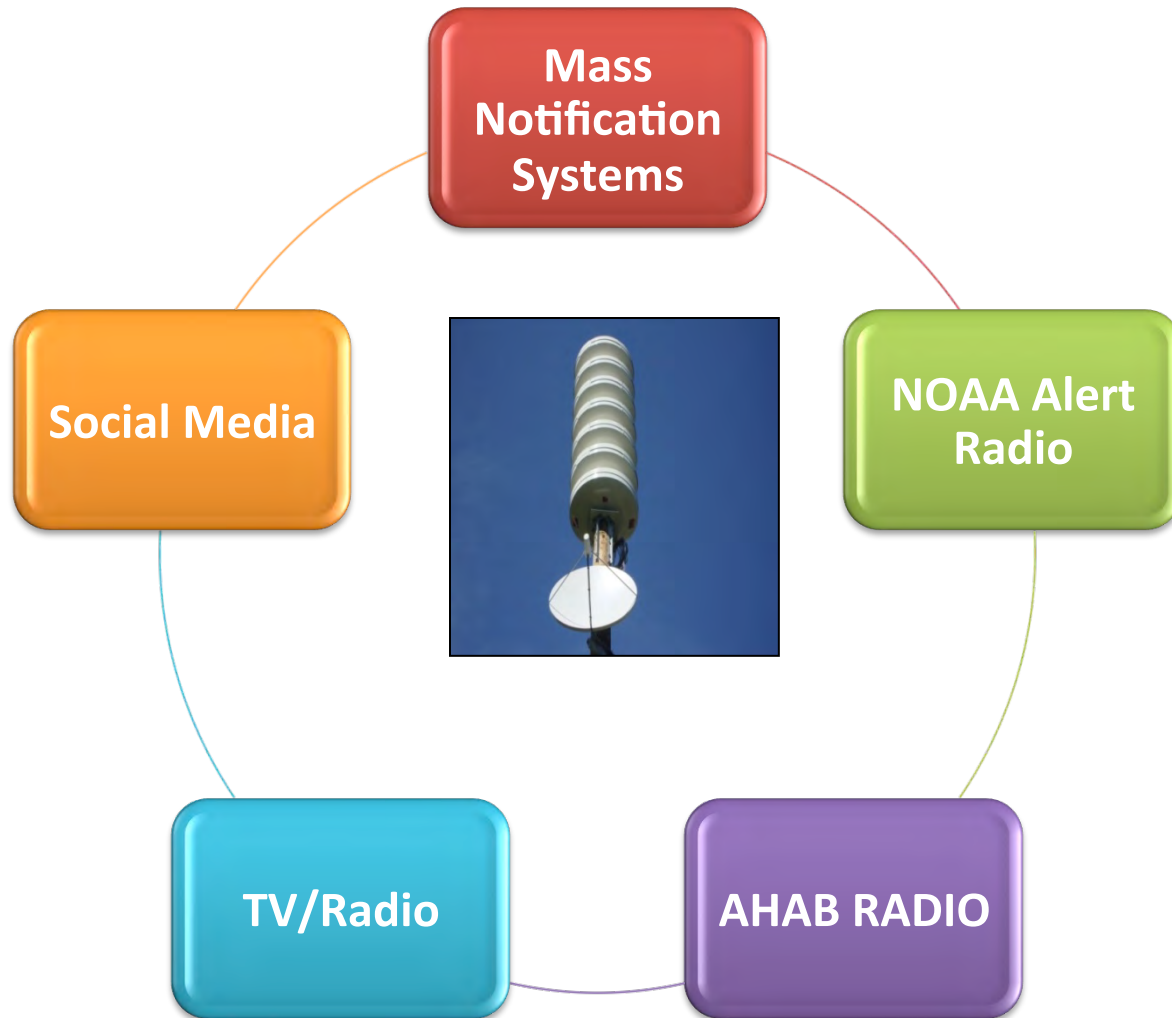


## **Information Statement**

- **For information only, no tsunami generated.**



# Distant Tsunami Notification



# Re-entry After a Distant Tsunami

- **ALL CLEAR**
- Re-enter with Caution
- Damage
  - Harbors
  - Beaches
  - Low-lying areas
  - Roads, Bridges
- Clean up



**SHOULD ANYONE DIE**

**FROM A DISTANT TSUNAMI?**

**NO**