

# Tsunami Preparedness in the Capital Region

*A presentation by the CRD*

*Local Government Emergency Program Advisory  
Commission (LG EPAC) and your community  
emergency programs*

# What is a tsunami?

- A tsunami is a natural hazard consisting of a series of long surge-like waves generated when a large volume of ocean water is rapidly displaced.
- There is no way to predict if a tsunami may happen.
- Tsunami waves can keep coming for hours.
- The largest wave may be hours after the first one – stay away from the shore until local government officials tell you it is safe to return.

# Why shouldn't I wait for an official warning if I feel a major earthquake?

- STRONG SHAKING IS YOUR WARNING!
- If you feel a strong earthquake that lasts for 60 seconds or more, or makes it difficult to stand, go to higher ground ***immediately!*** (Any where in the world)
- Officials may not have time to get to coastal areas to warn you or communications systems may be damaged due to earthquake.

# What causes a tsunami?

- Major submarine or coastal earthquakes are the cause of most tsunamis and create the biggest tsunamis, in terms of wave height at shore and the size of affected area.
- Tsunamis may also be triggered by landslides, volcanoes or explosions.

# What types of events could cause a tsunami in the CRD?

There are two types of tsunamis:

- ***Distant Tsunami*** - Will not be “felt,” e.g.. Alaska or Japan.
- ***Local Tsunami*** – Will be “felt,” Cascadia Subduction Zone (CSZ) or “the Big One”.

# Threat from “Distant Tsunamis”

- Most of CRD has minimal threat from waves caused by tsunamis from distant earthquakes.
- We may see stronger than normal currents however
- The Juan de Fuca Electoral Area (Port Renfrew, Jordan River) however does have a significant threat as they face the Pacific Ocean

# Tsunami Travel

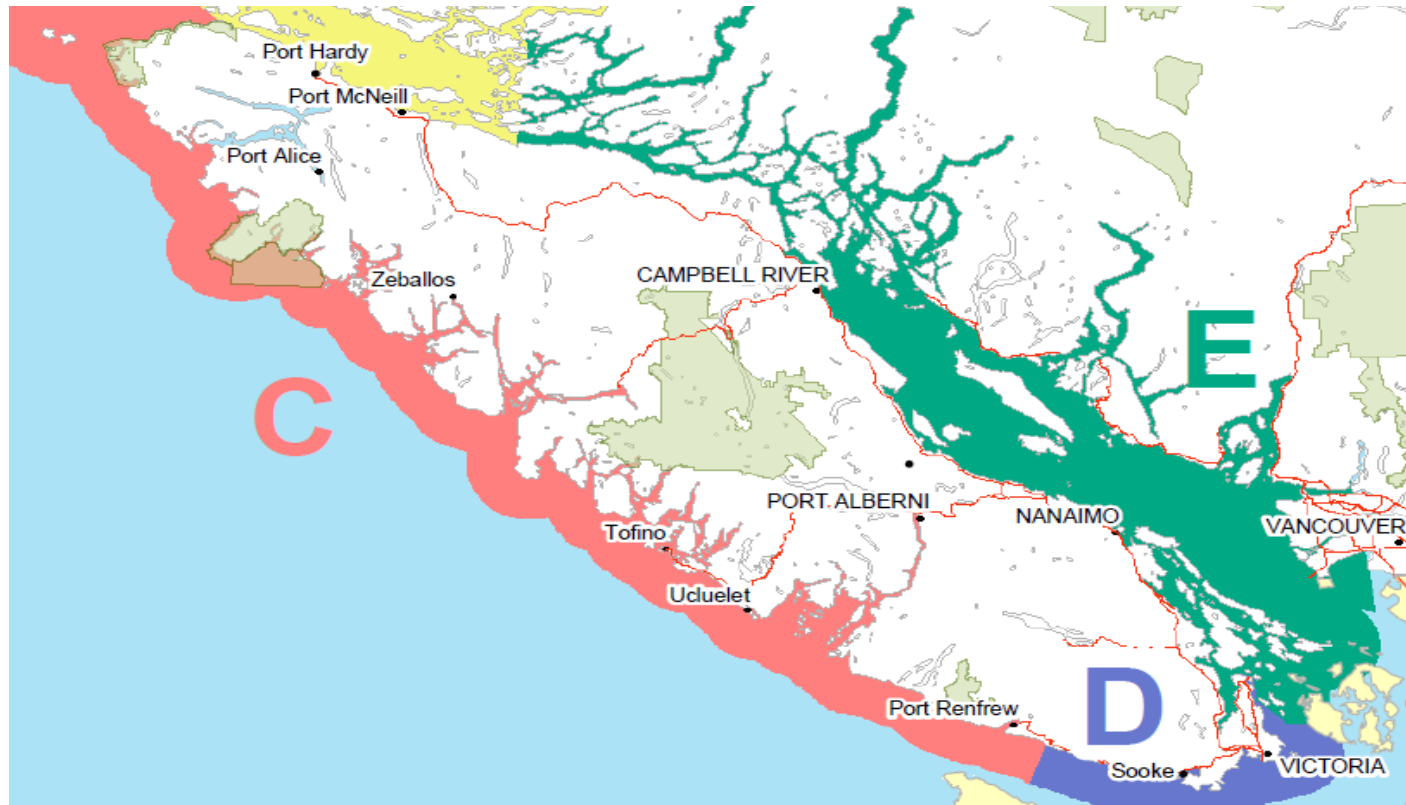
- Tsunamis travel at 800kmh (500mph), the same as a jet plane!!
- As tsunamis cross the ocean, there is no giant wave, you would not know you have passed over one

# How will I know a distant tsunami is coming?

- You will generally have hours before a tsunami arrives.
- It is low risk, maximum 20 cm or 8 inch rise in water height in this area
- An alert is issued by authorities (WCATWC, EMBC).
- The Province and local government officials enact community notification procedures if necessary.
- Subscribe directly to receive WCATWC alerts:  
<https://public.govdelivery.com/accounts/GOVDUSNWS/subscriber/new>



# What are the different BC tsunami notification zones?



# Tsunami Alerts: What do they mean?

A **Watch** (least serious level of alert) is issued if the danger level is not known and you should stay alert for more information.

An **Advisory** (second highest level of alert) indicates that strong currents are likely and you should stay away from the shore.

A **Warning** (most serious level of alert) indicates that an inundating wave is possible and evacuation may be suggested.

Local government officials will let you know when the danger has passed.

# “Felt” earthquakes may cause a tsunami

- Lets look at tsunamis from earthquakes we will feel

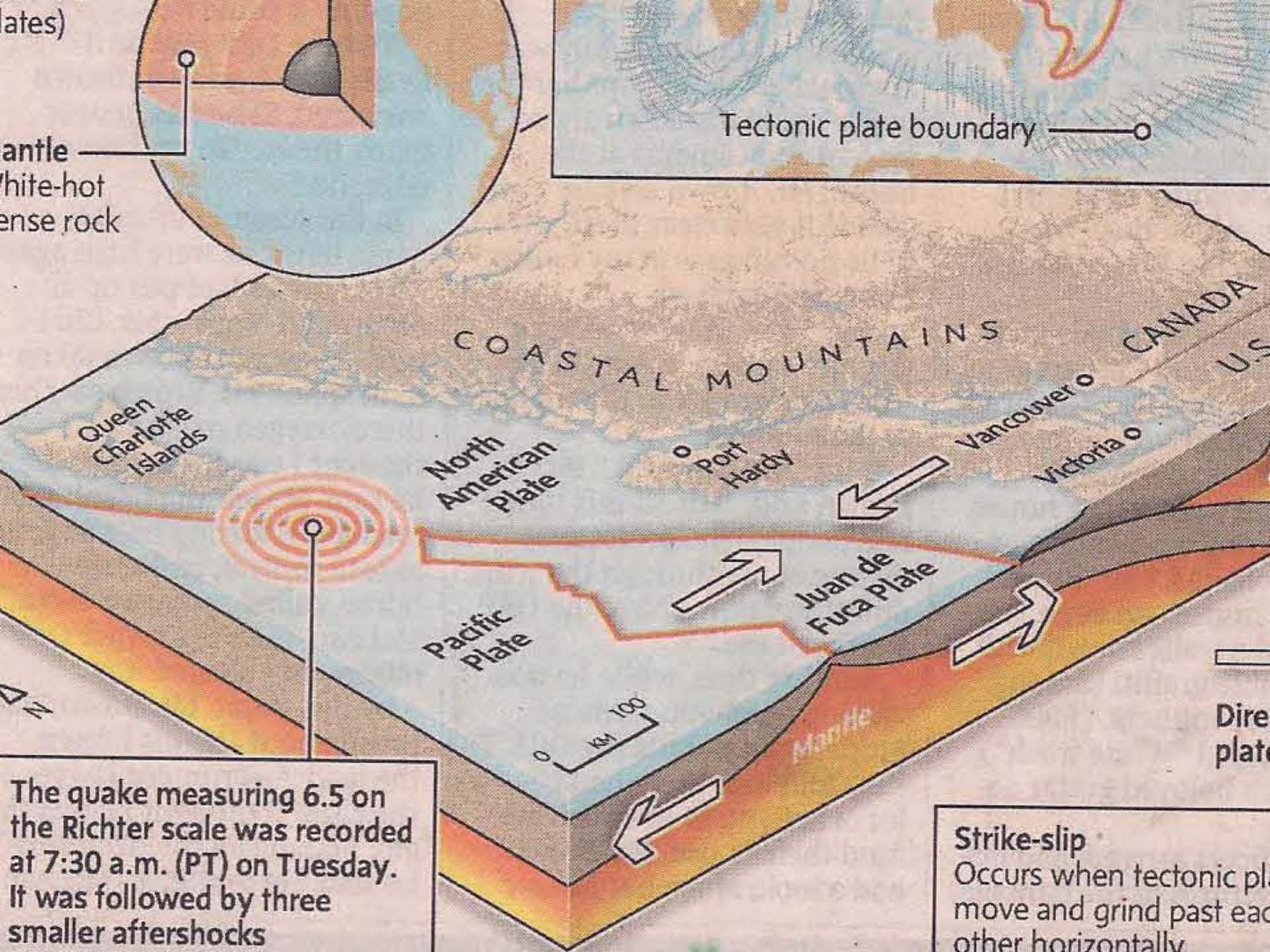
# Earthquake safety

- Most tsunami risk in our region is from a *“felt”* earthquake.
- Remember your earthquake safety:



- If you are near the ocean, move to higher ground or inland once the shaking has stopped.





ates)

antle  
white-hot  
dense rock

Tectonic plate boundary

Queen  
Charlotte  
Islands

COASTAL MOUNTAINS

North  
American  
Plate

Port  
Hardy

Vancouver

Victoria

CANADA  
U.S.

Pacific  
Plate

Juan de  
Fuca Plate

0 100  
km

Mantle

Direction  
of plate  
movement

The quake measuring 6.5 on the Richter scale was recorded at 7:30 a.m. (PT) on Tuesday. It was followed by three smaller aftershocks

**Strike-slip**  
Occurs when tectonic plates move and grind past each other horizontally

# What should I do in the event of a tsunami?

- If an earthquake is felt, Drop, Cover and Hold on for 60 seconds or until after the shaking stops.
- Immediately go to higher ground or inland!
  - “Higher ground” in the Capital Region is generally 4m or 13 feet elevation above high tide level.



# When do I Evacuate?

- If you are near the ocean and feel a major earthquake lasting 60 seconds or more or it's hard to stand, get to higher ground!
- You may also notice:
  - A sudden rise or fall of ocean level.
  - A loud roaring noise from the ocean.

# Where should I Evacuate From?

- Check PrepareYourself.ca for a map to find out if you live, work, play or go to school in a potential hazard area so you can be prepared.
- Move away from beaches, harbours, marinas, and low lying areas if you feel a strong earthquake.
- Do NOT go to the beach/harbour to watch the tsunami, and do NOT plan on surfing it!!!



# How long will it take for the tsunami to arrive?

Location	Tsunami Arrival Time (min)	Time to Maximum Water level (min)	Maximum Water level (m)
Port Renfrew (entrance)	35	50	3.5
Sooke Harbour (entrance)	60	75	2.5
Esquimalt Harbour (entrance)	77	96	2.7
Victoria Harbour and Gorge Waterway (Entrance)	76	95	2.5
Cadboro Bay	90	160	2.0
Sidney	110	150	2.0

Reference: Capital Regional District Modeling of Potential Tsunami Inundation Limits and Run-Up

# Magnitude 9 Earthquake

- How long till the tsunami arrives and how high will it be?
- Esquimalt Lagoon

Arrival 77 minutes, height 2.7 meters

Maximum height in 96 minutes

Cole Island

Height 3.1 meters

# Channelling of water

- As channels/harbours narrow and get shallower the wave will increase in height

# Coberg Peninsula

- The wave will cross the peninsula, and pick up logs and other material, and carry it into the Lagoon
- The wave height inside the Lagoon will be 2.3 meters
- The waves will inundate properties on the inside of the Lagoon and deposit debris from the peninsula

# How should I Evacuate?

- Evacuate immediately on foot or bicycle to an area outside the tsunami hazard area (check map, generally 4m or 13 ft. elevation above high tide level).
- Keep roads clear for emergency vehicles - use a car only if absolutely necessary.
- It is NOT necessary to go to the highest point in the area.

# How Long Should I Evacuate For?

- Return to the evacuated area only when local government officials tell you it is safe to return.
- Waves can arrive for hours, so it may not be safe to go back even after the first wave has arrived.
- Large aftershocks can also generate additional waves.

# What does tsunami modeling tell us?

- An idea of where we are most at risk and the types of planning we should do.
- What we might expect in a specific, significant event.
- How the tsunami moves through the region.

# What does the tsunami “hazard area” mean?

- The tsunami hazard area is below the projected inundation (flood) line where we expect water to come up onto shore, and gives us an idea of areas that may be at risk of tsunami flooding in the Region.



# Where can I go to find out if I'm in a tsunami hazard area?

- Go to [PrepareYourself.ca](http://PrepareYourself.ca) to view a map of the area, or contact your local emergency program.
- This area above the line gives a guideline to help determine a safe distance away from any tsunami wave run-up onshore, usually 4m or 13ft elevation above high tide level.

# How is this map different than the one from 2004?

- This map was created with updated science and GIS data using the Neowave model.
- The map does not differ largely from the original, but confirms planning zones already in place.

# How accurate is the modeling?

- It is based on many variables, looking at maximum probable results.
- Science is constantly being upgraded.
- The Neowave model has proven accurate when tested against actual events.
- The model is meant to provide a guideline for emergency planning and to help the public understand where safe areas are likely located.

# Mapping

- Mapping will be available from your local emergency program or on [PrepareYourself.ca](http://PrepareYourself.ca)

# Tsunami Safety

If you are near the ocean, the most important things to do if you feel an earthquake lasting 60 seconds or more, or it makes it hard to stand:

- Drop, Cover and Hold On for 60 seconds.
- Move to higher ground immediately  
( generally 4m or 13ft elevation above high tide level).

# Where can I get more information?

- [PrepareYourself.ca](http://PrepareYourself.ca)
- Your local emergency program

# What can I do?

- Get involved in your community emergency program.
- Know your neighbours.
- Be familiar with where the tsunami hazard areas are located and where safe areas are to evacuate.
- Have emergency kits for all family members, including pets.
- Learn more about emergency preparedness and risks in the Region at [PrepareYourself.ca](http://PrepareYourself.ca).

# Wide Area Mass Notification System-DND

- DND is installing “Tsunami Sirens” to warn it’s employees of emergencies
- These devices will sound a siren, followed by a voice message
- The use of these sirens will be controlled by the Rescue Coordination Centre in Dockyard



# Locations

- Initial installations will be at
  - Dockyard
  - Naden
  - Colwood Supply Depot
  - Workpoint

# Additional Locations Phase 2

- Additional sirens may installed within the next couple of years including
  - Rocky Point
  - 443 Squadron (Victoria Airport)
  - Albert Head

# Use of Sirens

- The sirens may be used all at once in an event like a tsunami, siren then voice message
- Each site may be operated separately, siren then voice message e.g.. Hazmat spill
- Sirens will be tested regularly

# Affect on Colwood

- Our residents and visitors will hear them which may result in
  - 911 calls to fire and police
  - Calls to City Hall/Fire Hall enquiring about the sound
  - Public enquiries (counter)

Shake, shake, shake, shake, shake,

**Drop, Cover, Hold on**

**Shakeout,**

**10:17 on 10-17**

**CRD**

Making a difference...together

# Questions?

**Emergency Program  
City of Colwood**