

# Earthquake and Tsunami Preparedness Guide



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# IMPORTANT!

## Earthquake safety

If you feel the ground shake or receive an alert on your phone, TV or radio from the Canadian Earthquake Early Warning system, **immediately Drop, Cover and Hold On.**

After the shaking stops **count to 60** before getting up. This gives loose objects time to settle.





# IMPORTANT!

## Tsunami safety

If you are near the coast when an earthquake occurs, **Drop, Cover and Hold On**. When the shaking stops, get to higher ground to protect yourself from a potential tsunami.



# A seismically active province

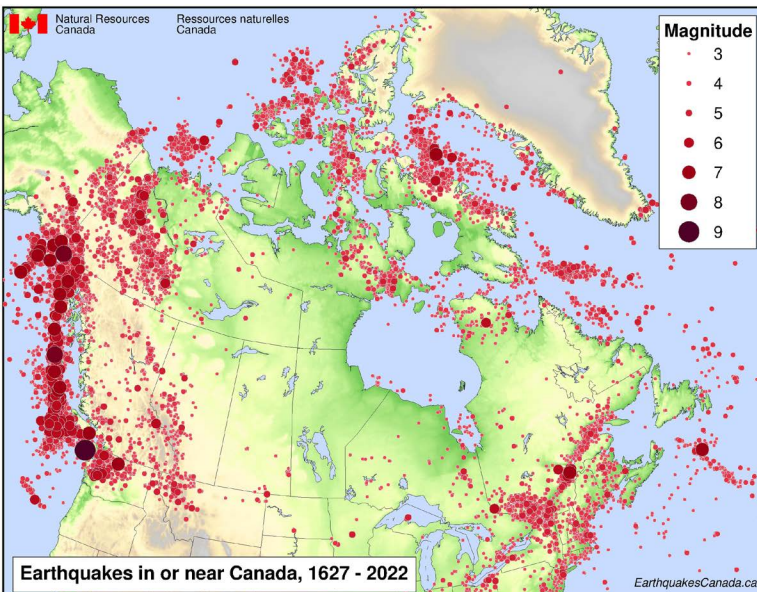
Earthquakes are common in British Columbia. Around 4,000 are recorded in the province each year.

Most of these earthquakes are too small to be felt, however, earthquakes strong enough to cause damage do happen.

The most at-risk regions of British Columbia are along the west coast, where the threat of a destructive tsunami is also very real.

Take the time to prepare. It's important that all people in British Columbia know what to do during and after a major earthquake and tsunami.

The information in this guide can help you get started. Check out other PreparedBC resources, such as the Home Emergency Plan and In it Together: Neighbourhood Preparedness Guide from [PreparedBC.ca](https://www.preparedbc.ca).



### A narrative of Huu-ay-aht seismic history

On January 26, 1700 at about 9 pm, a powerful magnitude 9 earthquake struck off the coast of B.C. and, without warning, was followed by a catastrophic tsunami that devastated the village of Loht'a. With no time to respond, all 5,000 residents of Loht'a were lost to this devastating event.

This is the story of the Great Earthquake and Tsunami that was told to me by my grandparents, George and Louisa Johnson. For generations, Elders in our community as well as other First Nations along the coast have maintained this legend, and others like it, as an oral history of our people.

Today, our people call Anacla (Pachena Bay) home and this oral history plays a central role in how we understand tsunami risks in our community. We are able to use our history to learn from the past and prepare for future tsunamis.

**by Robb Johnson from  
Huu-ay-aht First Nation**



From top right, George and Louisa Johnson, Robb Johnson, Pachena Bay on the west coast of Vancouver Island.



# What is an earthquake?

Earthquakes are created by stresses between and within tectonic plates on the earth's surface that are constantly moving apart, sliding past one another or colliding. Some movements are too small to notice, while others result in big earthquakes.

Earthquakes cannot be predicted.

The first sign of an earthquake may be a bang, rumble, or an alert on your phone, TV or radio. You may then feel the ground shake and roll for up to five minutes.

Aftershocks are generally smaller earthquakes in the same area. They can continue for many days, weeks or even years.

In B.C., there are four common types of earthquakes:



### **1 Earthquakes along the Cascadia Subduction Zone**

happen when the Juan de Fuca Plate moves under the North American Plate. These earthquakes have the highest magnitudes (amount of energy released) and will trigger a tsunami.



**2 Deep earthquakes** occur well below the earth's surface, within the subducting Juan de Fuca Plate. These earthquakes generally result in weaker shaking.



**3 Crustal earthquakes** occur within the North American Plate, close to the earth's surface. Depending on their magnitude, these earthquakes can cause significant damage.

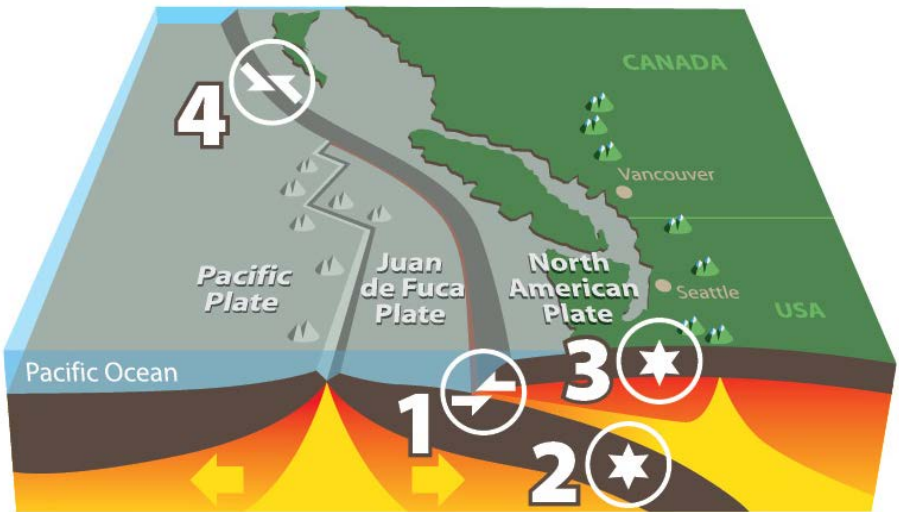


### **4 Earthquakes along the Queen Charlotte Fault,**

off Haida Gwaii, happen when the Pacific Plate slides past the North American Plate horizontally (side by side). These earthquakes have been some of the largest recorded in B.C.

No matter the type or location of an earthquake, individuals need to be prepared.







## Before an earthquake

### 1. MAKE A PLAN

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Thinking ahead and creating a home emergency plan will strengthen your ability to respond and recover.

When making your plan, keep the following in mind:

- Phone, gas, electric and water services may not work after an earthquake.
- Roads could be blocked, stores closed and gas stations out-of-service.
- You and the people you live with could be on your own for several days.
- It may be weeks before infrastructure, utilities and essential services are restored.
- Consider the unique requirements of everyone in your home, such as children, older adults, pets and those with additional needs.
- Think about what they need to be safe and comfortable during an emergency.

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Download PreparedBC's fill-in-the-blanks home emergency plan from [PreparedBC.ca](https://PreparedBC.ca) and complete the checklist below.

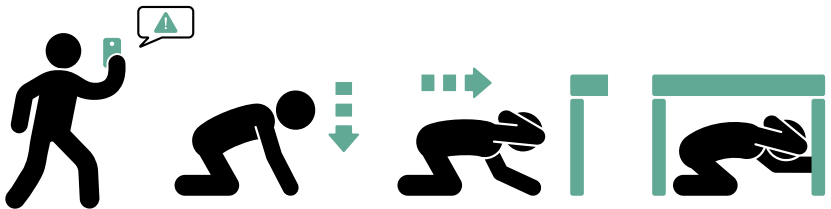
- Identify the hazards in your region.
- Identify what official sources you'll get information from.
- Make an emergency phone list with at least one out-of-area contact.
- Identify any special needs, such as medications, and make sure a proper supply is on hand.
- Pick a meeting spot if you're separated from loved ones.
- Store enough food and water for everyone in your home for at least two weeks.
- Learn how to turn off utilities.
- Create grab-and-go bags.
- Secure your space.

### 2. LEARN ABOUT THE CANADIAN EARTHQUAKE EARLY WARNING SYSTEM

The Canadian Earthquake Early Warning system is designed to alert for earthquakes that are likely to cause damage.

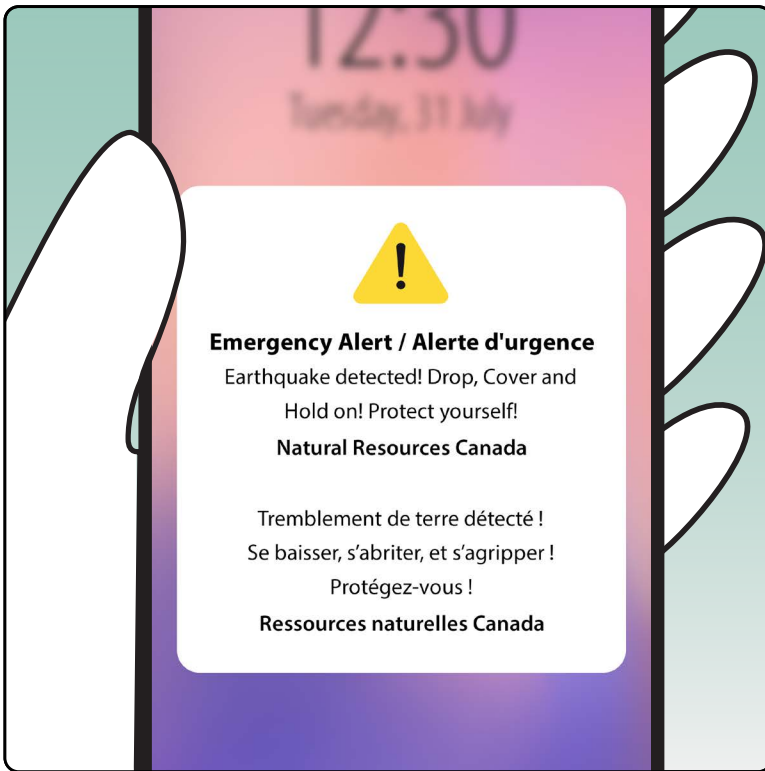
Earthquake early warning systems cannot predict earthquakes. The Canadian Earthquake Early Warning system provides seconds to tens-of-seconds of warning by detecting an earthquake immediately after it occurs, giving you enough warning to **Drop, Cover and Hold On**.

Learn how the Canadian Earthquake Early Warning system works by visiting Natural Resources Canada:  
[canada.ca/earthquake-early-warning](https://canada.ca/earthquake-early-warning)



### Earthquake Early Warning alerts to the public

In B.C., the Canadian Earthquake Early Warning system sends alerts to the public through the National Public Alerting System. Alerts will appear on TV, radio and compatible mobile phones.



**IMPORTANT:** When you receive an alert, immediately take action to Drop, Cover and Hold On.

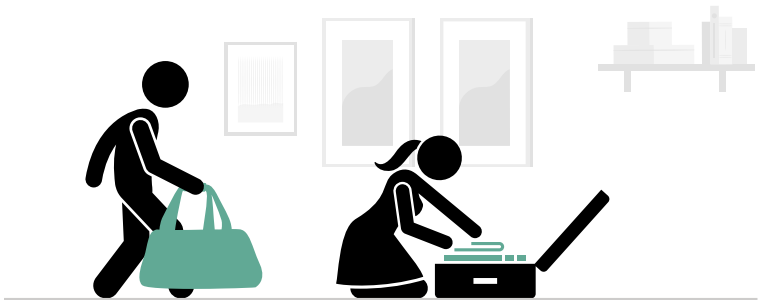
### 3. STORE EMERGENCY SUPPLIES

If your home, apartment or condominium is structurally safe following an earthquake, the best thing you can do is shelter-in-place. In other words – stay where you are. This will help first responders do their job and support those who need them most.

Collect non-perishable food, water and emergency supplies to last each person (and pet) in your home for at least two weeks, or longer. Make sure everything is stored together in an accessible location.

Live in a multi-unit building? Check out PreparedBC's **Guide for Apartments, Condos and Townhomes.**

You should also **prepare grab-and-go bags** for each person in your home, including pets, in case you have to leave quickly. These should be smaller versions of your emergency kit but customized to meet unique personal or medical needs. Ensure the bags are accessible and that everyone knows where they are.



## Earthquake and Tsunami Preparedness Guide



**First-aid kit and medications**



**Dust mask to help filter contaminated air**



**Garbage bags and moist towelettes for personal sanitation**



**Copy of your emergency plan, copies of important documents such as insurance papers and identification, and cash in small bills**



**Water, four litres per person per day, for at least two weeks, for drinking and sanitation**



**Non-perishable food: for at least two weeks, with a manual can opener**



**Battery-powered or hand-crank flashlight and extra batteries**



**Seasonal clothing, sturdy footwear and emergency blanket**



**Phone charger, power bank or inverter**



**Battery-powered or hand-crank radio**



**Whistle to signal for help**

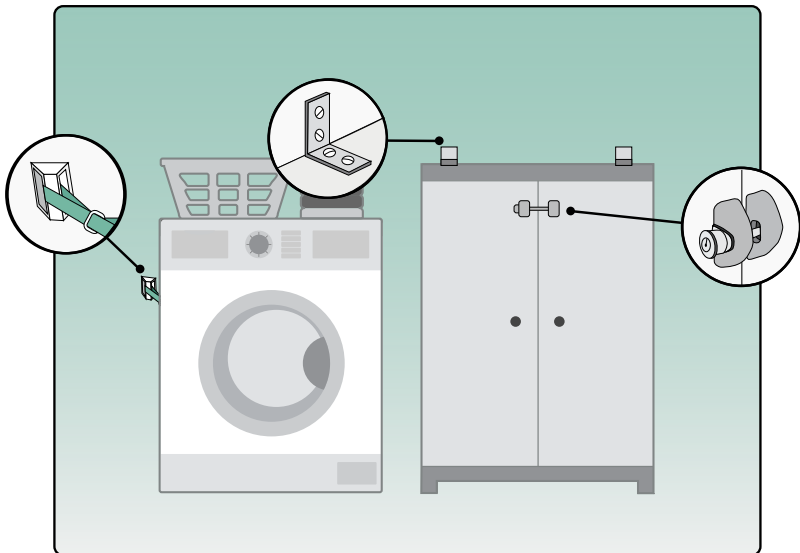


**Personal toiletries and items such as an extra pair of glasses or contact lenses**

### 4. PREPARE YOUR HOME

Strong shaking can cause large furniture and appliances to fall over. It can also cause heavy items to fall from walls and shelves, and cupboard doors to open. To prevent these things from happening:

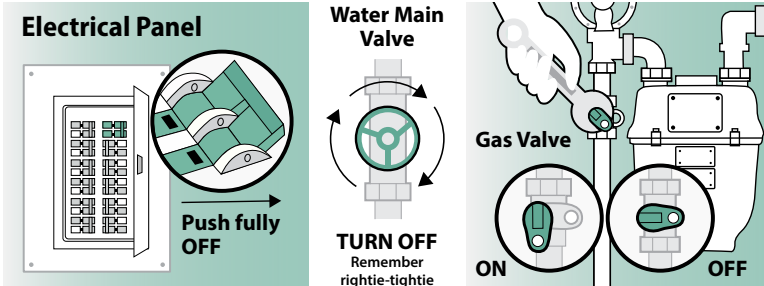
- Secure tall, free-standing furniture, such as bookcases, cabinets and shelving, to wall studs using “L” brackets, corner brackets or anodized aluminum molding.
- Move framed pictures and mirrors away from beds, couches and chairs.
- Secure cabinet doors with push or pull latches.
- Use strong strapping and ratchets or other connectors to secure refrigerators, freezers, washers and dryers.
- Anchor water heaters snugly to the wall with straps. If necessary, contract a licensed gas contractor to install a flexible gas line.





## Earthquake and Tsunami Preparedness Guide

Learn how to turn off your home's electrical panel, water and gas valves in case you're instructed to do so by local officials. Hang a wrench close to your gas valve so it's close at hand when you need it.



**IMPORTANT:** If your gas is shut off at the meter, DON'T try to turn it back on. Only a licensed gas contractor can do that safely.

## 5. RESEARCH INSURANCE OPTIONS

Insurance is available for most hazards, including earthquakes, to help you rebuild and replace your belongings.

If you are evacuated or your home is damaged from a major event and you can't live there, insurance coverage is available for your additional living expenses while your home is being repaired.


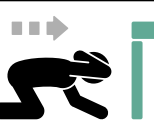


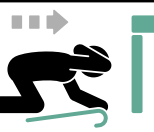


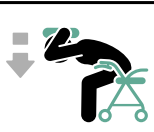




Review your insurance policy every year to understand the coverage you have and to make sure you're protected.

Contact your insurance representative or the Insurance Bureau of Canada at [ibc.ca](http://ibc.ca) or **1-844-227-5422** for information about home or rental insurance, including options such as earthquake insurance.

# During an earthquake

## 6. DROP, COVER AND HOLD ON

When you feel the ground shake or receive an alert, **immediately Drop, Cover and Hold On**. These three simple steps have saved lives and prevented injury in earthquakes around the world.

If Possible	 <p><b>DROP!</b></p>	 <p><b>COVER!</b></p>	 <p><b>HOLD ON!</b></p>
Using Cane	 <p><b>DROP!</b></p>	 <p><b>COVER!</b></p>	 <p><b>HOLD ON!</b></p>
Using Walker	 <p><b>LOCK!</b></p>	 <p><b>COVER!</b></p>	 <p><b>HOLD ON!</b></p>
Using Wheelchair	 <p><b>LOCK!</b></p>	 <p><b>COVER!</b></p>	 <p><b>HOLD ON!</b></p>

Graphic courtesy of the Earthquake Country Alliance

## Earthquake and Tsunami Preparedness Guide

- **Drop** to your hands and knees. This position prevents you from falling but allows you to move if necessary.
- **Cover** your head and neck with your arm and take shelter under a sturdy piece of furniture to protect yourself from falling objects. If there is no furniture nearby, crawl to the nearest interior corner or wall while continuing to protect your head and neck.
- **Hold On** to your shelter, covering your head and neck until the shaking stops. Count to 60 before getting up. This gives loose objects time to settle.



### IMPORTANT

If you are inside, stay inside. **DO NOT** run outside or to other rooms during an earthquake. Most injuries occur when people are knocked over or struck by flying debris. You are less likely to be injured if you stay where you are.

Practice **Drop, Cover and Hold On** at home, school and work so it's easy to remember during an earthquake. Join others by participating in the annual Great British Columbia ShakeOut earthquake drill.

Register today at [ShakeOutBC.ca](https://ShakeOutBC.ca)

**Shake  
Out**™

# After an earthquake

## 7. NEXT STEPS

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Stay in your home if it's safe to do so. Move cautiously. Look for hazards from above and below.

If your home has considerable damage and poses a safety risk or local officials have directed you to evacuate, leave immediately. Take your grab-and-go bags and follow official instructions from your First Nation or local government.

Reception centres may be opened to help with food and lodging, and for those who have been injured. Reception Centre locations will be listed in your Evacuation Order.

Only call 911 for life-threatening emergencies.

Be aware that there may be other hazards caused by an earthquake, including tsunamis, fire and landslides.

Always anticipate aftershocks. **Drop, Cover and Hold On** during aftershocks as well.

# What is a tsunami?

Tsunamis are most often caused by huge underwater earthquakes that move a large amount of water and trigger a series of large, powerful waves. The waves can be up to 100 kilometres long and spaced as much as an hour apart. In the deep ocean, tsunamis can move as fast as a jet plane - over 800 km/hour.



**This logo is the tsunami hazard symbol for British Columbia.**

Beaches, bays, tidal flats, coastal river banks and inlets along B.C.'s coastline are the most at risk to damage.



# Before a tsunami

## 1. KNOW WHERE TO GO

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If you live in or visit an area at risk of a tsunami, get to know the local evacuation routes and high ground locations.

In areas along the west coast of B.C., which don't have local tsunami evacuation maps or plans, practice routes that go as high or far inland (away from the water) as possible.

- **NEVER** go to the coast to watch a tsunami.
- **NEVER** go down to the water if you see it start to recede. This could be a sign that a tsunami may follow. A tsunami moves faster than a person can run. Move to high ground immediately!

Join a High Ground Hike in your community! These events take place every April during Tsunami Preparedness Week. It's an opportunity for community members to come together and run, walk or hike to "high ground" following a marked route. Learn more at [PreparedBC.ca/HighGroundHike](https://PreparedBC.ca/HighGroundHike)



## 2. KNOW YOUR ZONE

B.C.'s coastal communities are divided into five tsunami notification zones. Each zone includes all islands and inlets within it.

Knowing the notification zone where you live and travel will help you understand tsunami alerts and whether the area you are in is under a warning, advisory or watch. Detailed maps can be found at [PreparedBC.ca/tsunamis](http://PreparedBC.ca/tsunamis).

### Tsunami Zones in British Columbia

#### ZONE A

The North Coast and Haida Gwaii

#### ZONE B

The Central Coast and northeast Vancouver Island coast including Kitimat, Bella Coola and Port Hardy

#### ZONE C

The outer west coast of Vancouver Island from Cape Scott to Port Renfrew

#### ZONE D

The Juan de Fuca Strait from Jordan River to Greater Victoria including the Saanich Peninsula






#### ZONE E

The Strait of Georgia including the Gulf Islands, Greater Vancouver and Johnstone Strait



### 3. UNDERSTAND TSUNAMI ALERTS

**There are five alert levels and each has a distinct meaning**

Alert	Description	Action
 <b>Warning</b>	Flood wave possible	Full evacuation suggested
 <b>Advisory</b>	Strong currents likely	Stay away from the shore
 <b>Watch</b>	Danger level not yet known	Stay alert for more information
 <b>Information Statement</b>	Minor waves at most	No action suggested
 <b>Cancellation</b>	Tidal gauges show no wave activity	Confirm safety of local areas

The Tsunami Warning System is an international program to detect tsunamis. It provides notifications and warnings to all countries bordering the Pacific Ocean, Indian Ocean and the Caribbean.



## Earthquake and Tsunami Preparedness Guide

In B.C., the Ministry of Emergency Management and Climate Readiness receives alerts from the National Tsunami Warning Center in Palmer, Alaska and sends alerts to:

- The public, First Nations, municipalities and regional districts in at-risk zones;
- Provincial and federal governments and agencies; and
- News media.

Once a community is alerted that a tsunami is (or may be) expected, residents will receive information from local officials in different ways.

Possible methods are:

- Radio
- Television
- Telephone
- Text message
- Door-to-door contact
- Social media
- Weather radios and/or outdoor sirens.

Find out in advance how communities where you live and travel will share information in the event of a tsunami. Always follow instructions from local officials.



## During a tsunami

### 4. DROP, COVER, HOLD ON THEN MOVE TO HIGHER GROUND

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Officials may not have time to warn you of a tsunami, especially if you're in a remote area.

- If you are near the coast and see a sudden rise or fall of the ocean or hear a roar (like the sound of a jet engine), move to higher ground immediately.
- If you feel a strong earthquake, **Drop, Cover and Hold On**. Then move to higher ground immediately.

Once at high ground, stay there! Tsunami waves can last several hours and the first wave is not always the largest. Wait for the "All Clear" from local officials before assuming the event is over.



#### **DID YOU KNOW?**

A strong earthquake near land could generate a tsunami that arrives in just minutes. However, it may take hours for waves to reach the shore following an earthquake far away in the Pacific Ocean.

# After a tsunami

## 5. NEXT STEPS

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Once you have received “All Clear” from local officials, follow instructions from your First Nation or local government regarding next steps.

Reception centres may be opened to help with food and lodging, and for those who have been injured.

## ADDITIONAL RESOURCES

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EmergencyInfoBC is your provincial source of information during an earthquake or tsunami. For details about the event—such as areas of impact, recommended actions, and additional resources—visit [EmergencyInfoBC.ca](https://www.emergencyinfobc.ca).

Connect with your First Nation or local government to learn about the earthquake and tsunami response plans for your community.

Learn more:

- ClimateReadyBC: [climatereadybc.gov.bc.ca](https://climatereadybc.gov.bc.ca)
- Earthquakes Canada: [earthquakescanada.nrcan.gc.ca](https://earthquakescanada.nrcan.gc.ca)
- Canadian Earthquake Early Warning System: [canada.ca/earthquake-early-warning](https://canada.ca/earthquake-early-warning)
- ShakeOutBC: [ShakeOutBC.ca](https://ShakeOutBC.ca)
- National Tsunami Warning Center: [tsunami.gov](https://tsunami.gov)



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