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# WARN (Web-enabled Awareness Research Network)

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# WARN

A system to warn that an earthquake and/or tsunami has been detected and will soon impact the coastal region of British Columbia.

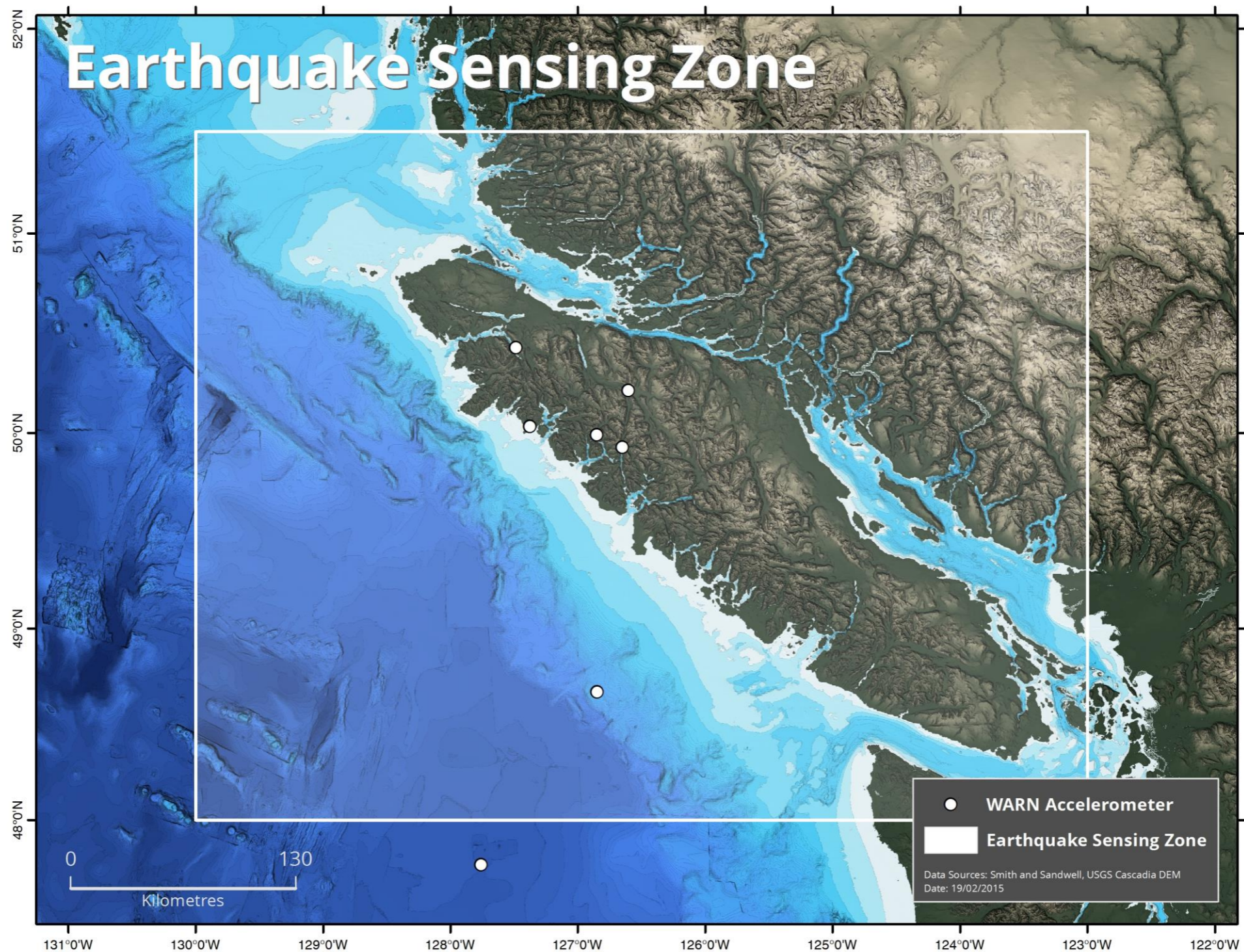
## WARN - Earthquake

- Warnings can be given 20 to 90 seconds before the arrival of the damaging earthquake waves.
- This is enough time to:
  - Automatically open firehall doors
  - Automatically close oil and gas pipeline valves
  - Stop performing surgery
  - Slow down trains
  - Automatically shut down or backup critical computer systems
  - Automatically stop traffic from entering tunnels.
  - Take cover.

## WARN – Earthquake Detection

- Earthquakes can be detected using specially designed accelerometers that can detect earthquake “P-waves”.
- P-waves are fast-moving compression waves that emanate from earthquakes but cause little or no damage.
- Slower moving “S-waves” arrive later and cause the damage due to their rolling motion.
- Ocean Networks Canada currently has some of these accelerometers installed on Vancouver Island and on the seafloor west of the Island. More sensors will be deployed over time.

# Earthquake Sensors and Direct Grid Search Boundary



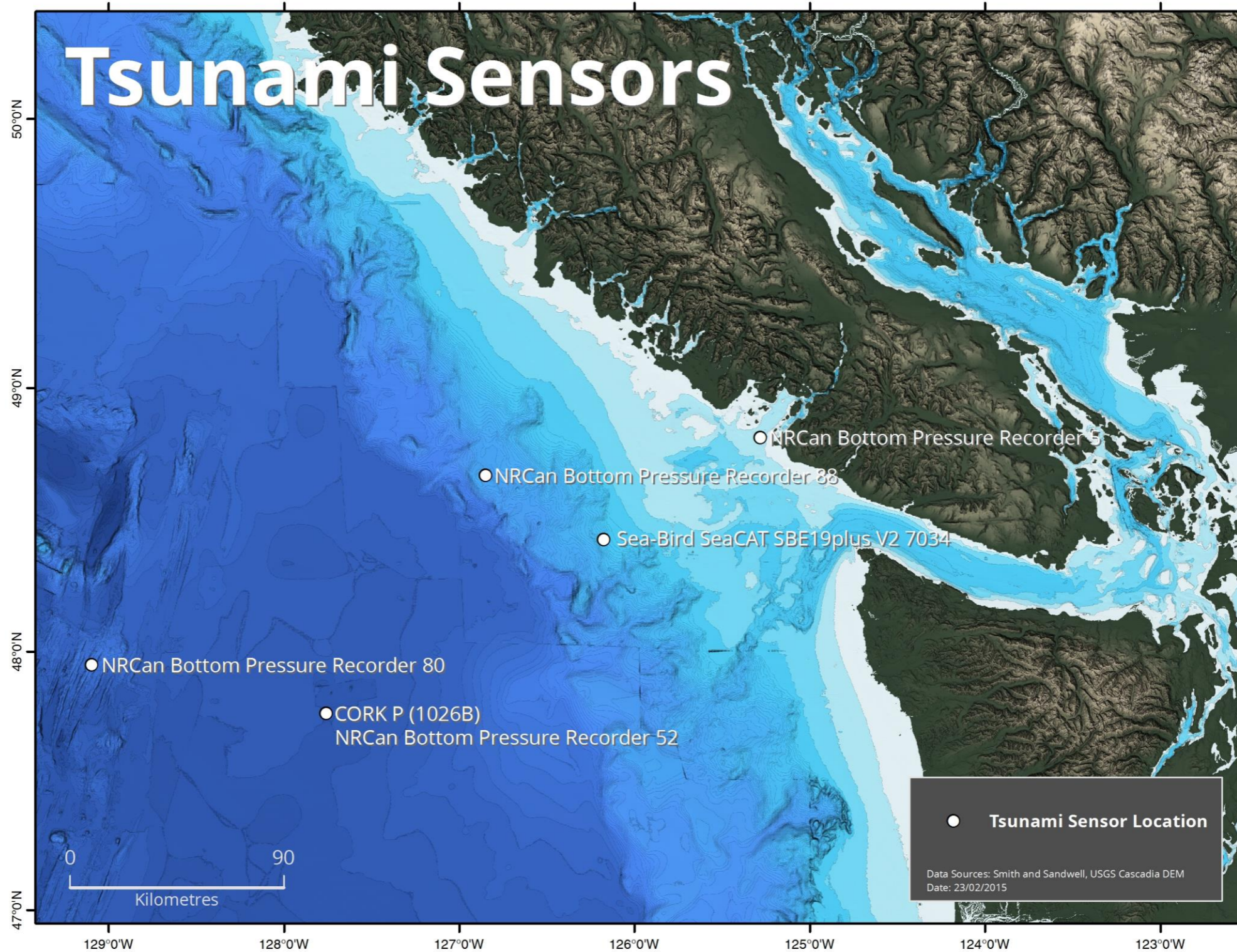
## WARN - Tsunami

- Warnings can be given minutes to tens of minutes before the arrival of tsunami waves.
- This is enough time to move to higher ground.

## WARN – Tsunami Detection

- Tsunami waves can be detected using “bottom pressure recorders” (BPRs).
- BPRs are installed on the seafloor and measure the weight of the water above them, and can detect long-wavelength waves since they affect the depth of the water.

# WARN Tsunami Sensors





# Event Notification

- Users can subscribe to earthquake or tsunami events.
- At this time, users must create an account on the Ocean Networks Canada “Oceans 2.0” website. They also require permission from Ocean Networks Canada in order to subscribe.
- Users can choose to be notified by direct server notification, Apple Push notification (if they have our iPhone app), or by e-mail.
- All events and notifications are logged.

# Subscribing to an Event

The screenshot shows a web browser window at <http://dmas.uvic.ca/EventMaintenance>. The page title is "Ocean Networks Canada Event Maintenance" and the user is logged in as "Bob Crosby". The navigation menu includes "Data Search", "Code Runner", "Plotting Utility", "SeaTube", "Digital Fishers", "Cameras", "Projects", "More", and "Tools".

The main content area has tabs for "Event Definition", "Event Log", "Event Subscription", "Email Notification Log", and "Server Notification Log". The "Event Subscription" tab is active, showing a form with the following fields:

- Server Notification:** Active: ; Callback URL:
- Email:** Active: ; Email Address:
- Apple Push Notification:** Active: ; Device Tokens:

There are "Save" and "Cancel" buttons at the top right and bottom right of the form area. On the left side, there is a list of event definitions, with "WARN Earthquake Detection" highlighted in green. A red button labeled "+ Add Event Definition" is located at the top left of the list.

## Example E-Mail Notification (earthquake test)

```

> <?xml version="1.0" encoding="UTF-8" standalone="no"?> <alert
> xmlns="urn:oasis:names:tc:emergency:cap:1.2">
> <identifier>ED17:1424281853275</identifier>
> <sender>dctsk03.dc.neptune</sender>
> <sent>2015-02-18T17:50:53+00:00</sent>
> <status>Test</status>
> <msgType>Alert</msgType>
> <scope>Public</scope>
> <info>
> <category>Geo</category>
> <event>Earthquake</event>
> <urgency>Expected</urgency>
> <severity>Unknown</severity>
> <certainty>Observed</certainty>
> <eventCode>
> <valueName>Event</valueName>
> <value>earthquake</value>
> </eventCode>
> <effective>2015-02-18T17:50:53+00:00</effective>
> <parameter>
> <valueName>OriginTime</valueName>
> <value>2015-02-18T17:50:50+00:00</value>
> </parameter>
> <parameter>
> <valueName>Epicentre</valueName>
> <value>49.17,-125.64</value>
> </parameter>
> <parameter>
> <valueName>Magnitude</valueName>
> <value>7.7</value>
> </parameter>
> <area>
> <areaDesc>NORTHEAST PACIFIC</areaDesc>
> </area>
> </info>
> </alert>

```

From: [dmas@dcmail.neptune.uvic.ca](mailto:dmas@dcmail.neptune.uvic.ca)  
Date: Feb 18, 2015 9:51 AM  
Subject: WARN Earthquake Detection  
To: [myname@telus.net](mailto:myname@telus.net)