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WARN (Web-enabled Awareness Research Network)

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AN INITIATIVE OF University of Victoria

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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.

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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.

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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.

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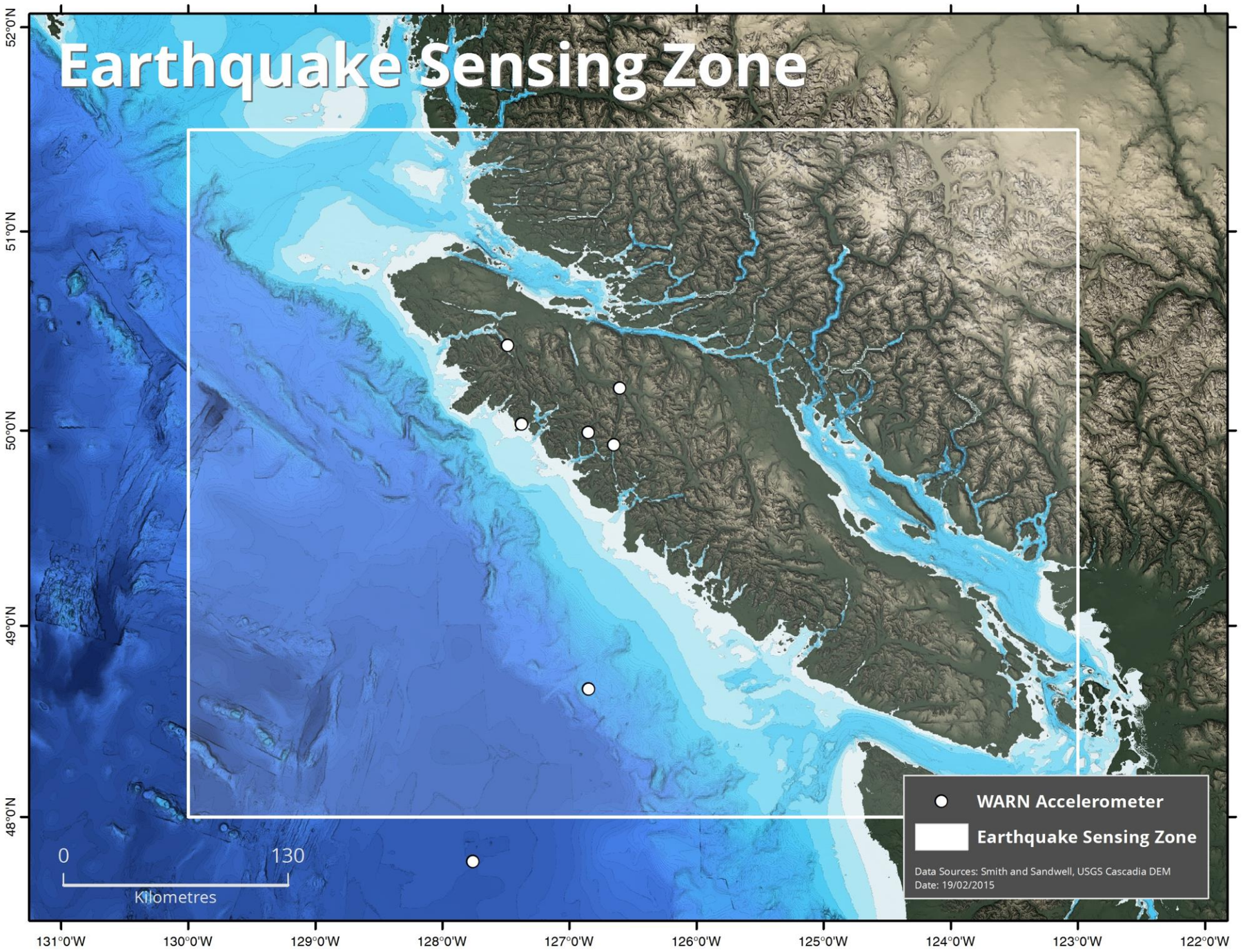
Earthquake Sensors and Direct Grid Search Boundary



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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.

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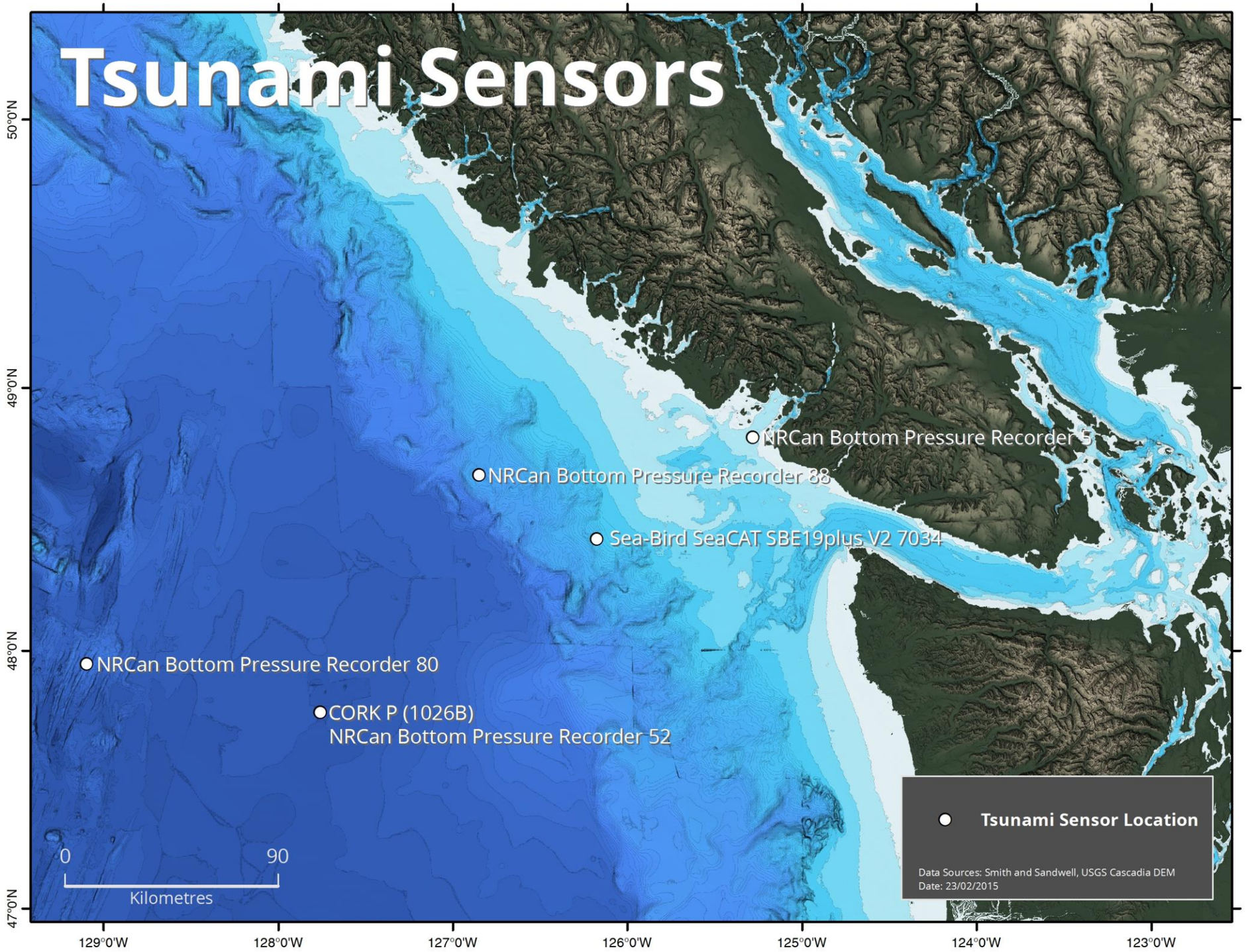
WARN Tsunami Sensors



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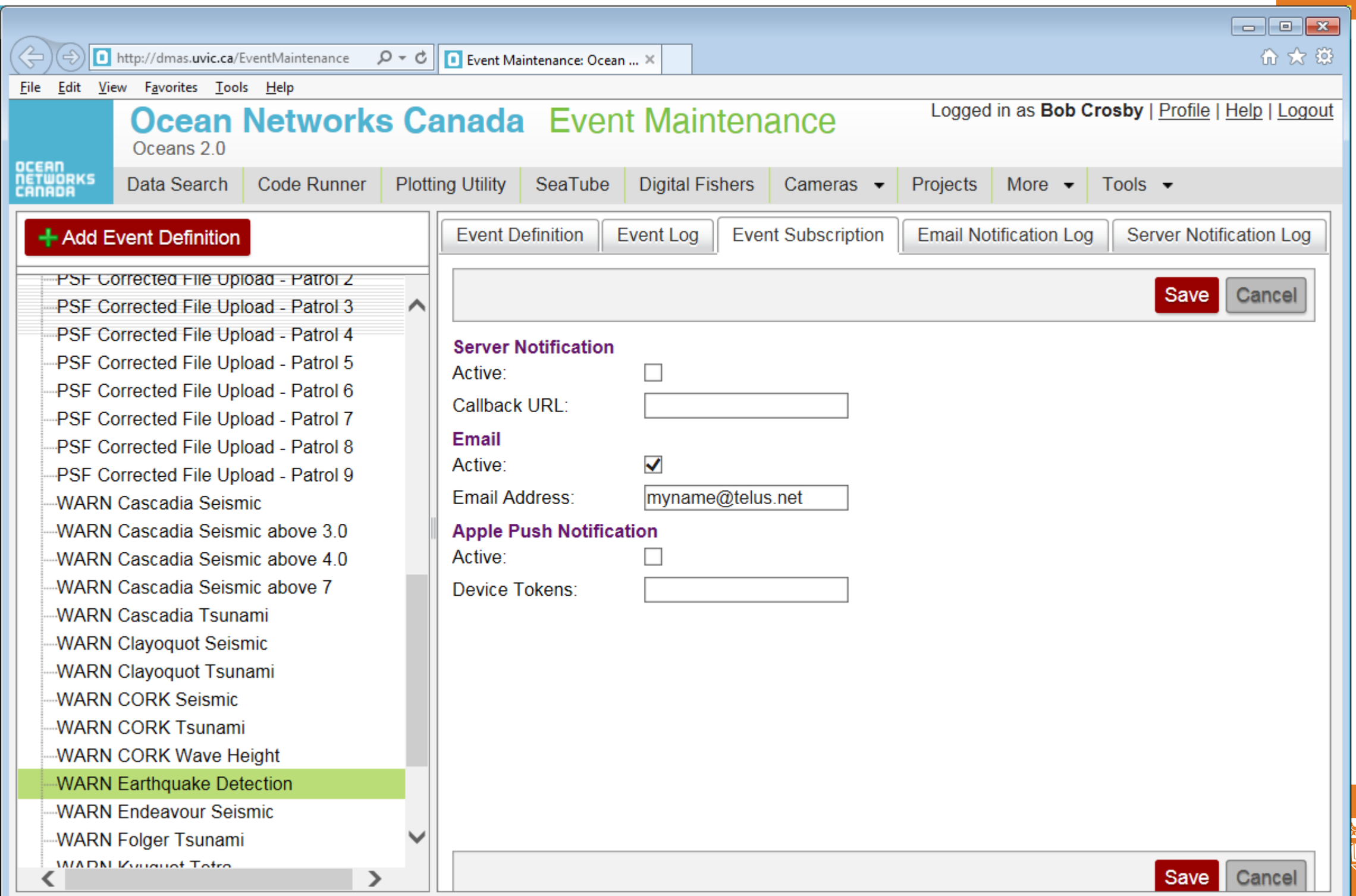
Event Notification

- 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



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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
Date: Feb 18, 2015 9:51 AM
Subject: WARN Earthquake Detection
To: myname@telus.net