



## Northern Cascadia Subduction Zone Observatory

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To accurately assess earthquake and tsunami hazards posed by the Cascadia Subduction Zone, it is critically important to know which area of the plate interface is locked and whether or not part of the energy is being released aseismically by slow creep on the fault. Deeper locking that extends further to the coast produces stronger shaking in population centers. Shallow locking, on the other hand, leads to bigger tsunamis. We will report on and discuss plans for a new amphibious Northern Cascadia Subduction Zone Observatory (NCSZO) that will leverage the existing NEPTUNE cabled seafloor observatory, which is operated by Ocean Networks Canada (ONC), and the onshore network of geodetic stations, which is operated by Natural Resources Canada (NRCan).

To create a NCSZO we plan to (1) add a network of seven GPS-Acoustic (GPS-A) sites offshore Vancouver Island, (2) establish a Deformation Front Observatory, and (3) improve the existing onshore geodetic network. The GPS-A stations will provide the undisturbed motion of the Juan de Fuca (JdF) Plate (1), deformation of the JdF plate (2), deformation of the overriding plate (3-7) and a cabled laboratory to study the potential for continuous GPS-A measurements (6). The Deformation Front Observatory will be used to study transient slip events using seafloor pressure and tilt instruments and fluid flux meters.

The majority of the offshore instruments will be installed in summer 2019. The station layout shown on the map (see poster) is a first draft. Final locations that maximize scientific return and optimize logistics are currently under discussion.