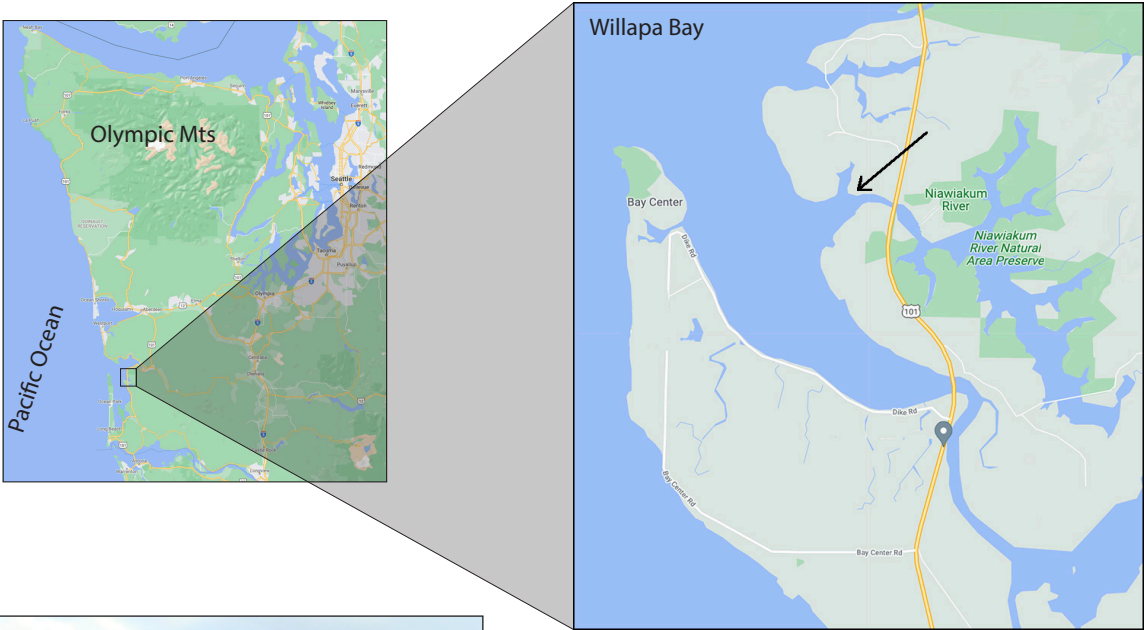


APPENDIX C—Niawaikum River, Washington Tsunami Sand Layers

The Niawaikum River outlet has layers of tsunami deposits that resulted from the Great earthquake and ensuing tsunami that occurred on January 26, 1700, discovered by geologists studying evidence for earthquakes in the Pacific Northwest.

*Figure A: (Right)
Map of northeast Washington, with an inset box showing the location of the Niawaikum River opening to Willapa Bay and the Pacific Ocean.*



*Figure B: (Left)
Workshop participants investigate evidence of the 1700 tsunami sand deposit.*

See next page for a closeup photo of the deposits being dug up and a graphic that describes the process of emplacement.

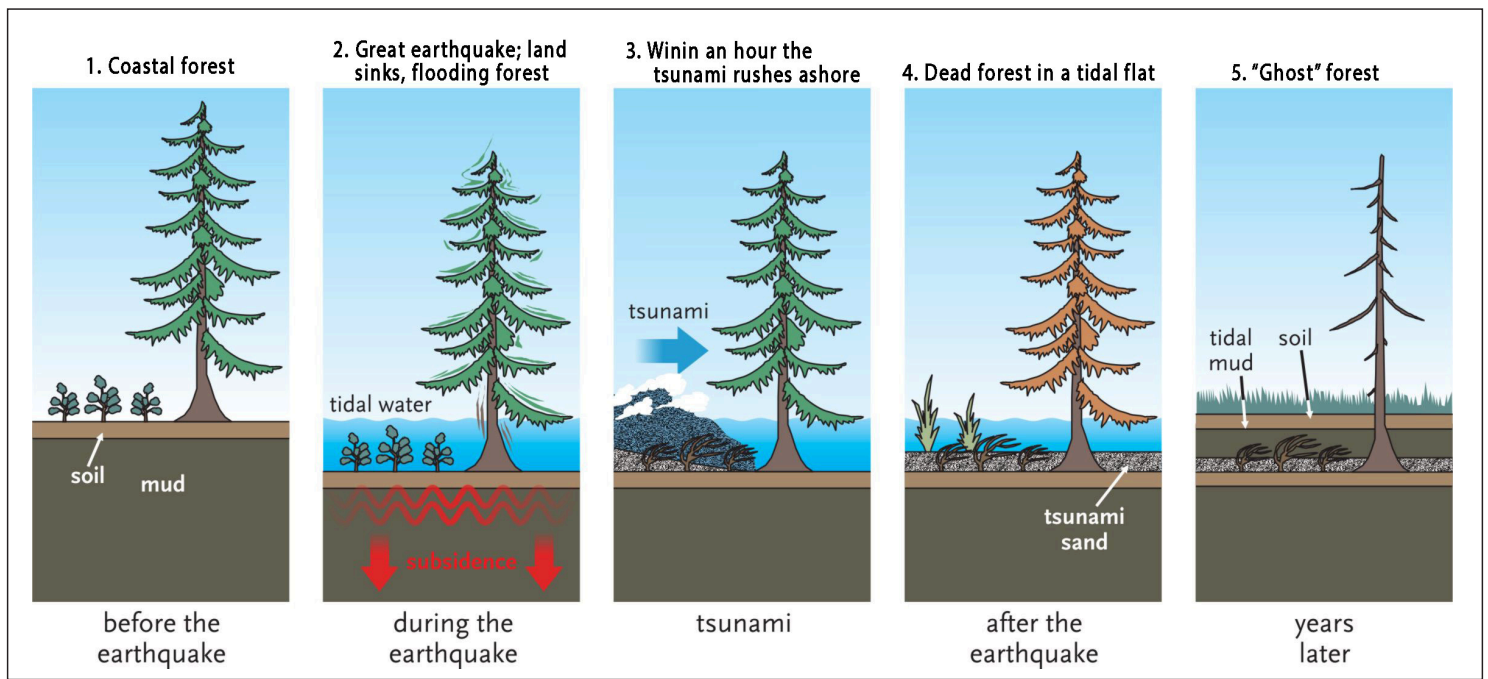


Figure C: Sequence of a great (M9+) earthquake causing subsidence. (1) The coastal forest is (2) submerged due to subsidence, (3) the tsunami rushes onshore, (4) depositing sand layers and leaving behind a dead forest. (5) Over time, the tsunami sand is covered by intertidal muds and clays. Image courtesy of John Clague, *At Risk: Earthquakes and Tsunamis on the West Coast*.



Figure D: Remnants of the 1700 Cascadia subduction-zone earthquake and tsunami. The tsunami sand layer (gray) overlays a former marsh, now peat layer. Notice at the bottom of the arrows, 3 thin horizontal coarse sand layers. Each layer records a boundary from a tsunami wave carrying and depositing sand. Intertidal mud and clays cover the sand layers.