

Paleoseismic Evidence for a Near Historic rupture within the Seattle fault zone: Implications for complex hanging wall kinematics

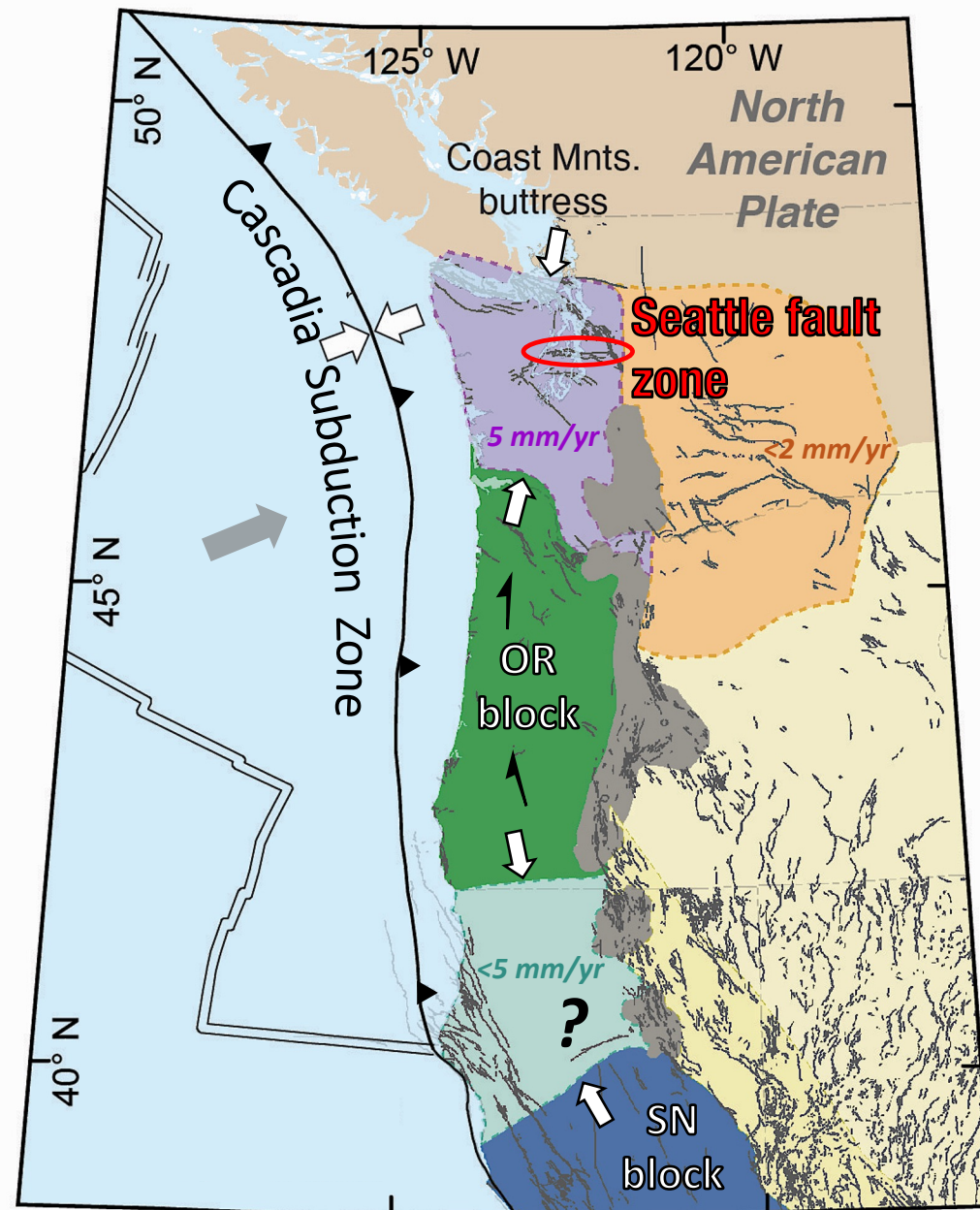


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Lydia Staisch – USGS GMEG, Portland OR
Wes Johns – UNR Reno, NV

Upper Plate Motivation in the PacNW

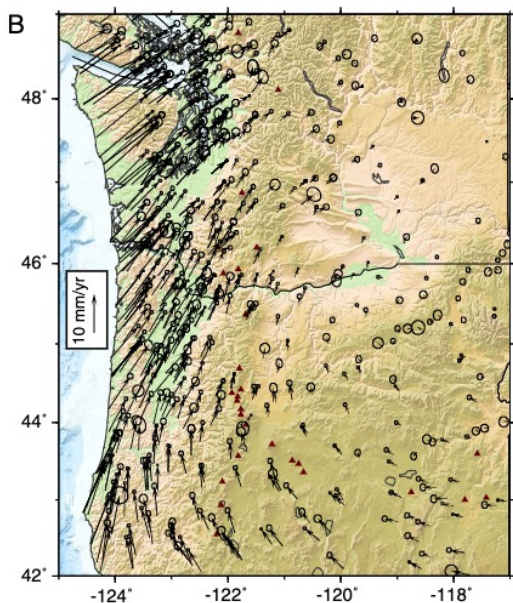
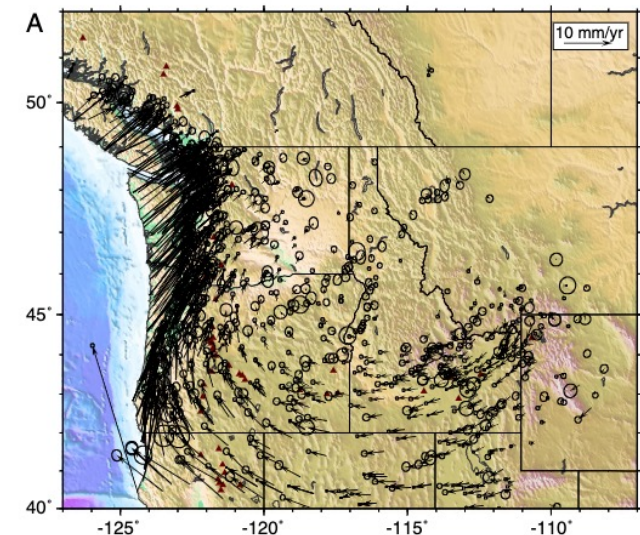
Clockwise rotation of Pacific Northwest

Relative block motion drives active deformation between "ridged" blocks



Modified from Wells et al. (2001)

McCaffery et al. (2013)



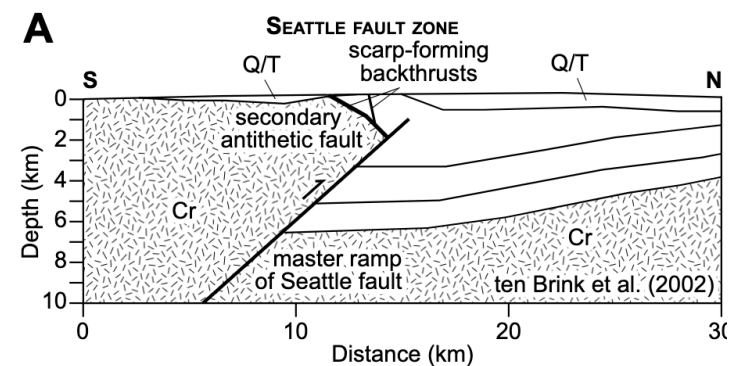
The Seattle fault zone



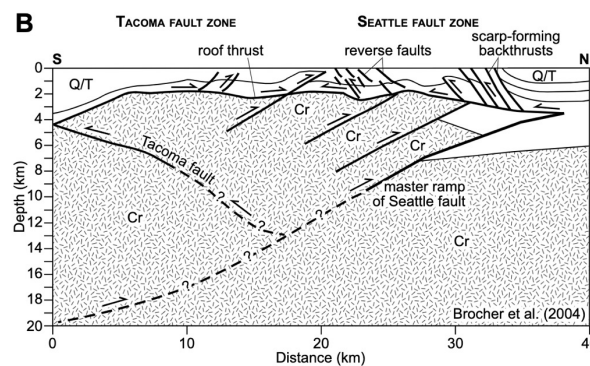
Pick your favorite cross-section....

from Nelson et al. (2014)

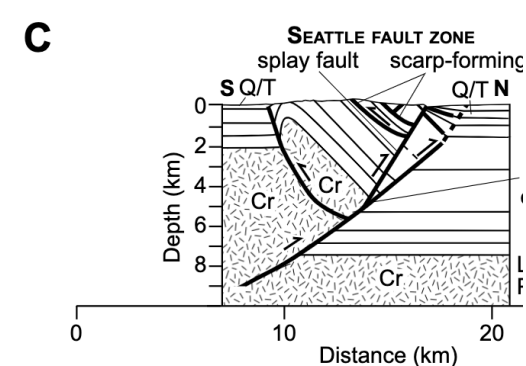
A



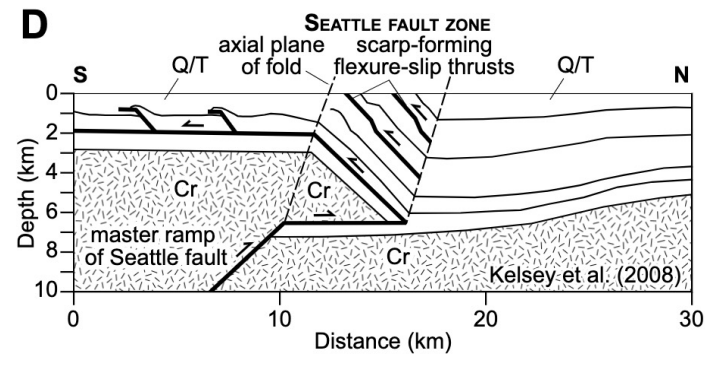
B



C

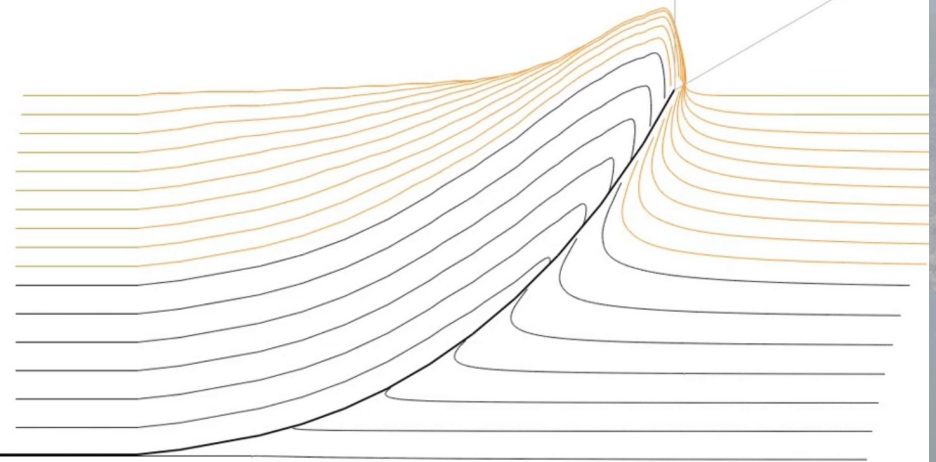


D

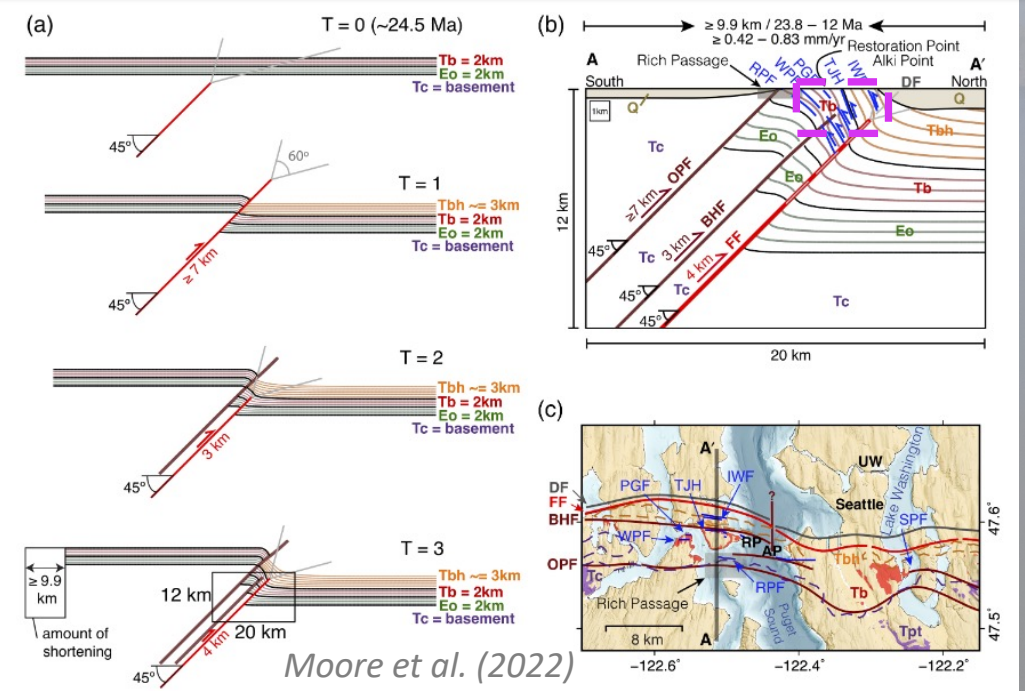
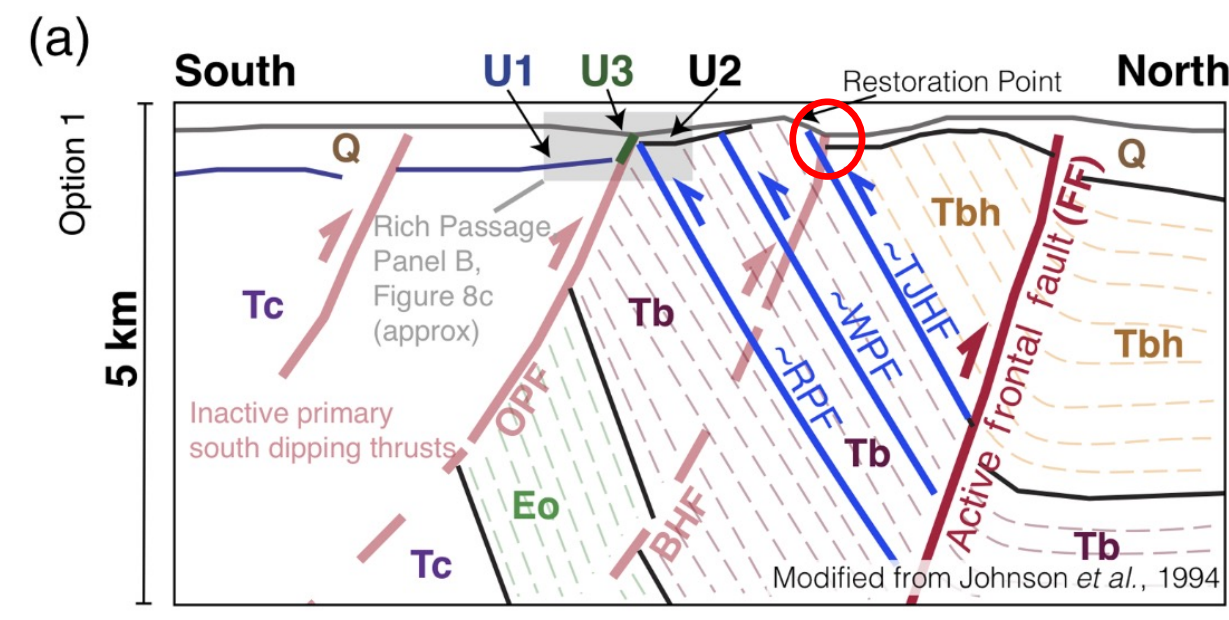


Complex shallow geometry of the Seattle fault zone

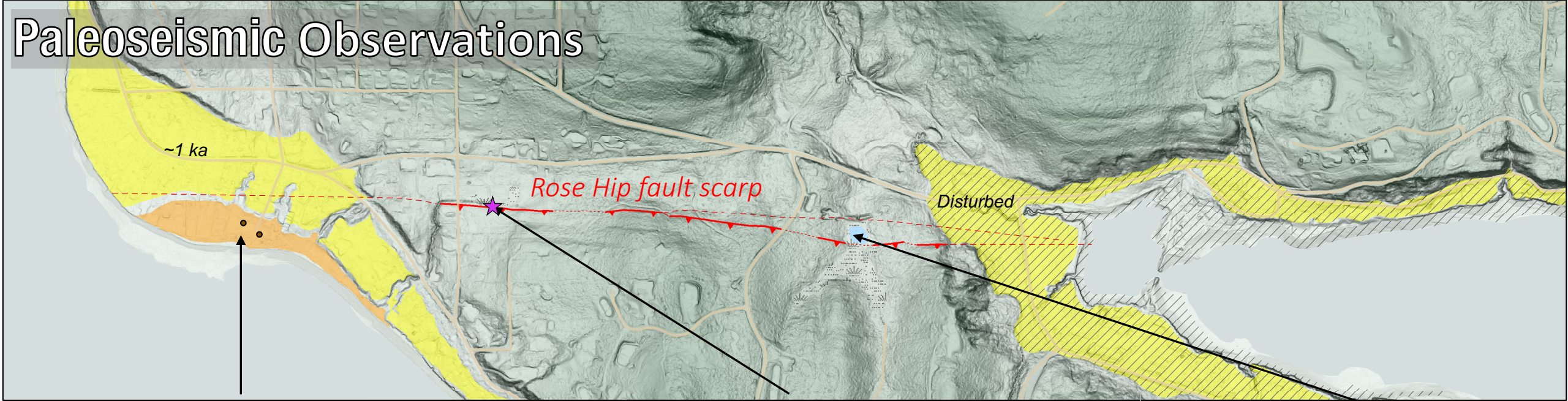
Fault propagation fold model



Allmendinger 2020-2022

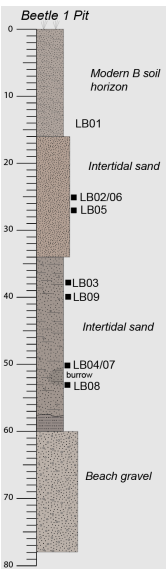


Paleoseismic Observations

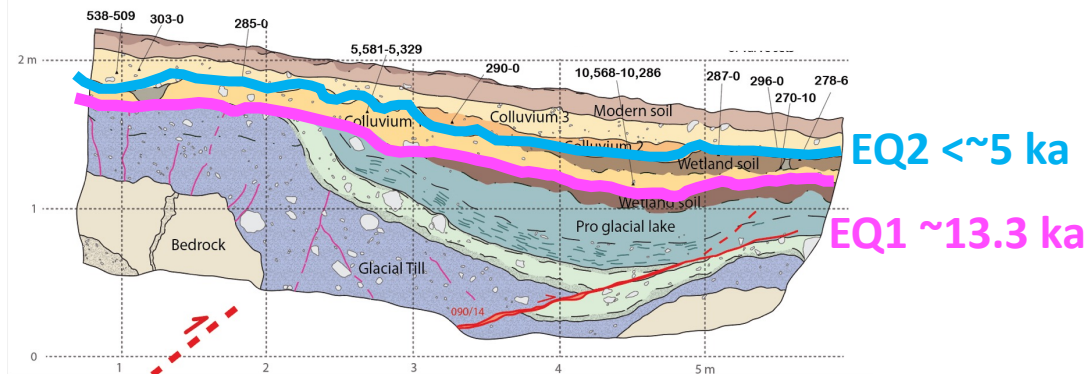


Lytle Beach Terrace

Uplifted inset
terrace formed
<280 cal yrs B.P.



Rose Hip Trench Site



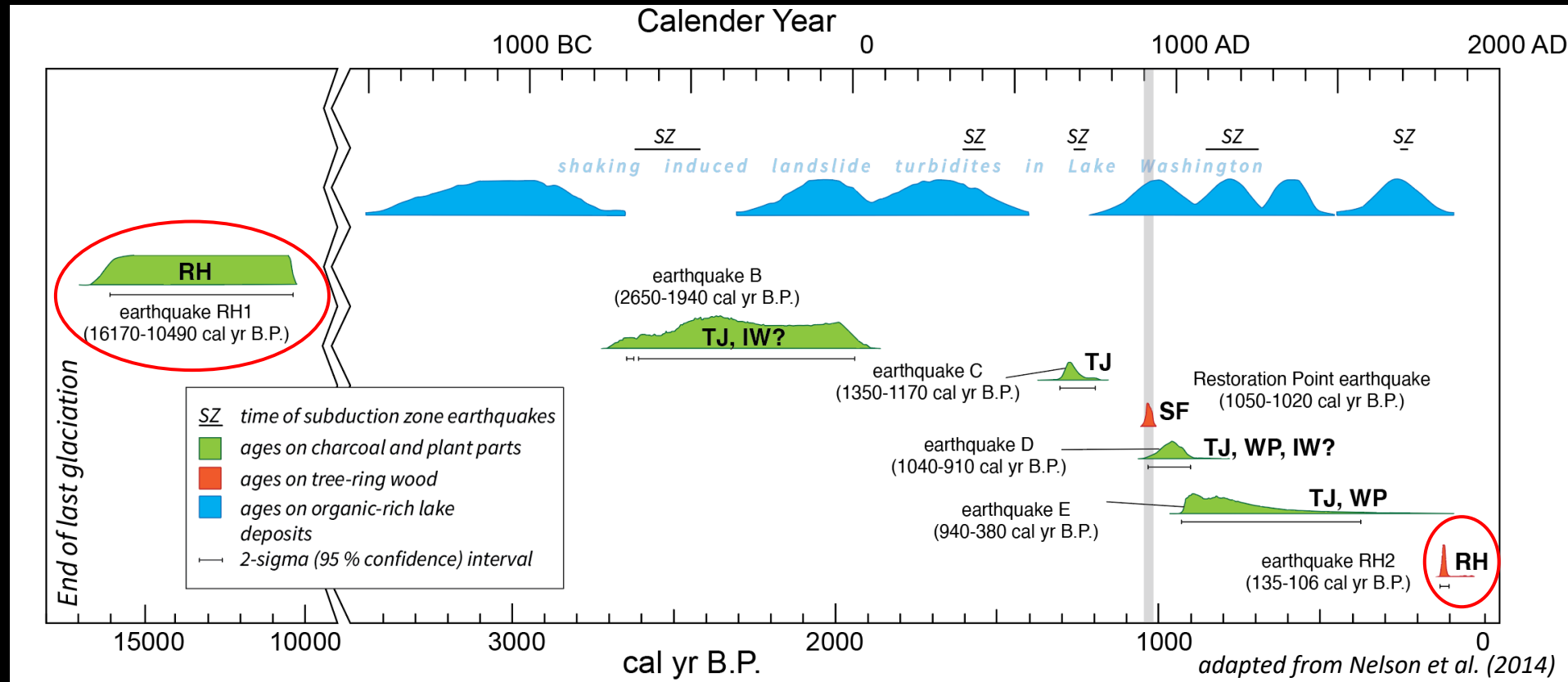
Scarp is the result of at least two surface deforming earthquakes that slipped on a 'blind' south-dipping master fault

Mill Pond

Dendrochronology indicates
drowned trees died
~1833*

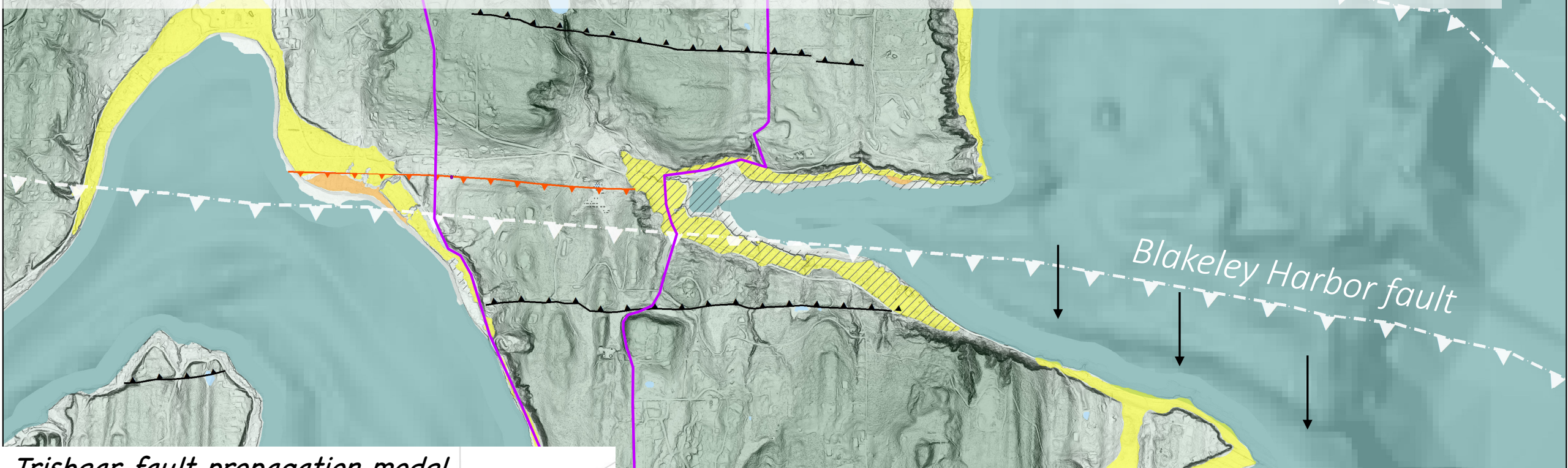


Rupture History within the SFZ



- Paleoseismic observations document the oldest (~13.3 ka) and youngest rupture (~1833) within the Seattle fault zone
- Suggest that the Rose Hip scarp ruptures independently

Possible Connection with the Blakeley Harbor Fault...?



Blakeley Harbor fault

