



NORTHWEST GEOLOGICAL SOCIETY

A regional association of professionals, students, & others interested in geology
Please visit www.nwgs.org for more about us

January, 2021 Newsletter

Volume 35, Number 1

January 12 Program Speaker

Program Zoom link [here](#). Password: diorite.

Reservations are not needed, but the program is limited to the 1st 100 participants.

6:30pm: social hour small group break-out sessions; 7:30pm: announcements and speaker program

Speaker: Brian Sherrod, USGS, *An Update on Paleoearthquakes in Western Washington*

Abstract: Paleoseismic studies documented prehistoric earthquakes after the last glaciation ended ~15 ka on 13 upper-crustal fault zones in the Cascadia fore arc. These fault zones are a consequence of north-directed fore arc block migration manifesting as a series of bedrock uplifts and intervening structural basins in the southern Salish Sea lowland between Vancouver, B.C. to the north and Olympia, WA to the south, and bounded on the east and west by the Cascade Mountains and Olympic Mountains, respectively. Our dataset uses published information and includes 27 earthquakes tabulated from observations of postglacial deformation at 63 sites. Stratigraphic offsets along faults consist of two types of measurements: 1) vertical separation of strata along faults observed in fault scarp excavations, and 2) estimates from coastal uplift and subsidence. We used probabilistic methods to estimate past rupture magnitudes and surface rupture length (SRL), applying empirical observations from modern earthquakes and point measurements from paleoseismic sites. Estimates of paleoearthquake magnitude ranged between $M \sim 6.5$ and $M \sim 7.5$. SRL estimates varied between ~20 and ~90 km. Paleoearthquakes on the Seattle fault zone and Saddle Mountain West fault about 1100 years ago were outliers in our analysis. Large offsets observed for these two earthquakes implies a $M \sim 7.8$ and ~200 km SRL, given the average observed ratio of slip/SRL in modern earthquakes. The actual mapped traces of these faults are less than 200km, implying these earthquakes had an unusually high static stress drop or, in the case of the Seattle fault, splay faults may have accentuated uplift in the hanging wall. Refined calculations incorporating fault area may change these magnitude and SRL estimates.

[JOIN THE PROGRAM VIA ZOOM!](#) Join the program by clicking the link above. There is no cost, and a reservation is not needed. You may join for both the social hour and the speaker program, or just the speaker program, **limited to the first 100 attendees**. During the speaker presentation, your microphone will be muted by the program host, but it is your option as to whether or not to mute your camera. A Q&A session will follow the presentation. During the presentation, click the **Chat** link at the bottom of the screen to type a comment or question to the general audience, or the **Raise my hand** link to directly ask the speaker a question or make a comment and the host will call on you.

Click on the Zoom link above to join the meeting

See www.nwgs.org for the full Zoom information.

Upcoming Speakers and Field Trips

Feb. 9: Dr. Anita Grunder, Oregon State Univ, Volcanic View of Plutonic Rocks: 11 MY of Magmatism at Aucanquilcha Volcanic Cluster on the Chilean Altiplano

Mar. 9: TBA

Apr 13: Pat Pringle, Centralia College Emeritus, Dendrochronology cross-dating of the Bonneville Landslide

May 11: TBA

Fall, 2021: possible rescheduling of Sky Cooley's field trip to the Othello area.

If you would like to volunteer to give a talk or lead a field trip for NWGS, please contact President [Chris Kimmel](#).

Please see the [NWGS website](#) for detailed announcements

Contact webmaster [Julie Masura](#) if you have any announcements to post on the website.

Announcements

- **Membership dues** for 2020/21 are due now. If you paid for 2019/20, your dues will be rolled over to the upcoming year. To pay, go to NWGS.org or mail a check or money order NWGS. See **About NWGS** below for amounts and the mailing address.
- **Please consider volunteering** for the upcoming President-Elect vacancy as Chris Kimmel moves to President and Katie Brower moves to Past President. Thanks to Katie for her dedication during this challenging year!
- The NWGS Board has voted to create a new **Technology position** that will combine overseeing the Zoom platform and webmaster duties. We need a skilled volunteer for this position.
- **Other Board positions:** please consider volunteering for one of the **At-Large Board positions** that will become available in 2021. **For more information about any of the Board position openings** (duties, time commitment, etc.) or to volunteer, please Contact President [Katie Brower](#).
- The [Tobacco Root Geological Society](#) (based out of Butte, MT) is planning an exciting field trip in the Pocatello, ID area, July 29-Aug 1, 2021, with Dave Pearson and Paul Link, in conjunction with their annual symposium at the ISU field station in Mackay, ID. All are welcome. See their [website](#) for details and registration.
- **Next Board Meeting:** Tues., Jan. 12, 5:30pm via Zoom.

NWGS needs great people like YOU!

Photo Spotlight



Oblique air photo of Restoration Point, Bainbridge Island, looking west (photo from WA Dept of Ecology shoreline photographs website). Note the well-preserved raised intertidal platform adjacent to the modern intertidal platform - a large earthquake in the winter of 924CE lifted the raised platform about 7 meters at this location.

About NWGS

The [Northwest Geological Society](#) is a non-profit educational organization which provides a forum for information and discussion on Northwest geology and related topics. The Society sponsors talks by leading academic and professional geologists at its monthly meetings, conducts field trips to locales of regional geologic interest, and publishes meeting summaries and field guides based on those activities. Membership is open to anyone interested in regional geoscience issues.

Program meetings are the 2nd Tuesdays, October through May. **Until we are able to meet in person again, meetings will be held via Zoom (see p. 1 or NWGS.org for the link). Anyone may attend the speaker the speaker program at no cost, and a reservation is not necessary.**

Field trips (members only): The Society sponsors two overnight field trips each year, in the fall and the spring, to locales of regional geologic interest. **(Suspended pending pandemic recovery.)**

Membership is open to anybody with an interest in geology. **Annual dues:** Professional: \$55; Student: \$10. **To join or pay annual dues:** go to www.nwgs.org, or mail a check or money order to [Northwest Geological Society](#), 4616 25th Ave NE #397, Seattle, WA. 98105. Please include your name, address, home phone, email, and employer/affiliation (if any).

Please visit [About NWGS](#) for more details.

Recommended Readings

Styron, R.H. & Sherrod, B., 2020, Improving Paleoseismic Earthquake Magnitude Estimates with Rupture Length Information: Application to the Puget Lowland, Washington State, U.S.A.. Bulletin of the Seismological Society of America, DOI 10.1785/0120200193.

Kelsey, H.M., Sherrod, B.L., Nelson, A.R., and Brocher, T.M., 2008, Earthquakes generated from bedding plane-parallel reverse faults above an active wedge thrust, Seattle fault zone: Geological Society of America bulletin, v. 120, p. 1581.

Nelson, A.R., Personius, S.F., Sherrod, B.L., Kelsey, H.M., Johnson, S.Y., Bradley, L.-A., and Wells, R.E., 2014, Diverse rupture modes for surface-deforming upper plate earthquakes in the southern Puget Lowland of Washington State: Geosphere, v. 10, p. 1-28.

Please send your reading recommendations to Newsletter Editor [Tom Bush](#).

To report a change of email or postal address or request to be removed from mailings, notify Membership Chair [George Bennett](#). Questions or comments? Contact President [Chris Kimmel](#).

NWGS Board

President	Chris Kimmel Landau Associates
President Elect	Open Please Volunteer!
Past President	Katie Brower Nelson Geotechnical
Secretary	Amy Knudson
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At-Large Board Members	Maura O'Brien Retired John LaManna Retired

Other Personnel

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