

February 2021

NISQUALLY CHAPTER OF THE  
ASSOCIATION OF ENVIRONMENTAL &  
ENGINEERING GEOLOGISTS

The Official

# AEG Nisqually Chapter Newsletter

## November Meeting Details

Tuesday, February 2nd

### Location: Go To Meeting

6:00 Presentation

Dinner: At your home

**FREE for Member or Non-Member**

### Upcoming Meetings:

March: Elizabeth Davis  
April: Kelsay Stanton



## Dendrochronological dating of co-seismic land-level changes along the Washington coast

Large earthquakes along the Cascadian coastline cause substantial land-level changes and inundate ecosystems with salt water for kilometers inland. Cascadia is expected to experience a catastrophic subduction event (as well as smaller, more frequent events) in the coming centuries, with the seismic moment likely occurring close to the rapidly growing urban area of Seattle's metropolitan corridor. There remain, however, substantial uncertainties on the recurrence of these massive hazards, as well as their potential effects on coastal ecosystems and communities. The turbidite and onshore geological records have identified multiple magnitude 8+ earthquakes over the past 2000 years. The interpretation of these records, however, could be a mis-representation of a series of lower magnitude events spread over years to decades. Further, the spatial and temporal manifestation of these events on the surface (i.e. the rate and location of subsidence) along the coast is complex and not well constrained. Here, we show how precise geochronology of tree-ring records from ancient, drowned forests in the puget lowlands allow us to date these events and analyze the impacts of coastal climate and extreme events beyond the limited span of instrumental records. These "ghost forests" were killed by co-seismic land level changes, such as drowning in fault dammed lakes or rapid subsidence and transition into a tidal environment along the coast. We use dendrochronologic methods on the sub-fossil wood (wood that is dead but not yet fossilized) from these paleolandscapes to more precisely date coastal subsidence and surface rupture events during the Common Era.

### Meeting Info:

<https://global.gotomeeting.com/join/982090581>

You can also dial in using your phone.  
(For supported devices, tap a one-touch number below to join instantly.)

United States: +1 (408) 650-3123  
- One-touch: <tel:+14086503123,,982090581#>

Access Code: 982-090-581



## Bio: Jessie K. Pearl

USGS Research Geologist

Mendenhall Postdoctoral Research Fellow

B.S. 2013, double major Geology &  
Environmental Sciences, Tufts University

Ph.D. 2019 Geosciences, University of  
Arizona



Dr. Jessie Pearl is a Mendenhall Postdoctoral Research Fellow with the U.S. Geological Survey in Seattle, WA. She is studying the recurrence and impacts of large crustal-fault earthquakes and Cascadia mega-thrust subduction zone earthquakes through the window of dendrochronology. Jessie earned her BS degree in Geology and Environmental Science from Tufts University, and her Ph.D. in Geosciences at the University of Arizona. Dr. Pearl is a dendrochronologist with experience in multi-proxy analysis of tree-ring records along the Atlantic and Pacific coastlines. Dr. Pearl has produced numerous coastal tree-ring records which are sensitive to climate phenomena, and she is an expert in comparing event years (drought, flood, storms) with reanalysis products, climate model outputs, and large-scale ocean-atmospheric patterns and modes. Her work uses dendrochronology, dendroecology, geochronology, and sedimentology to describe and analyze past landscapes, extreme events, and climate. Her dissertation was awarded the 2020 “Best Doctoral Thesis” from the Association for Tree-Ring Research. Dr. Pearl is an affiliate member of the University of Washington’s Quaternary Research Center, and an active member of the American Geophysical Union, The Geological Society of America, Tree Ring Society, Association for Tree-Ring Research, and Association for Women Geoscientists.



## Message from the Chair

### Wild winter

Greetings, AEG Nisqually! I hope that you have all been enjoying the winter and staying safe and healthy. The recent weather has kept me and the rest of my WSDOT Engineering Geology kin pretty busy of late. At last count, we have had 21 emergency call-outs for landslides, debris flows, rockfall, and other wintery geohazards. Most of those have been in the past few weeks. Some of them have been pretty impressive acts of geology! There's a large and recently exposed bedrock scarp just west of Hoquiam that might be worth checking out. There is a decent chunk of highway on the north coast that is closed, for who knows how long, due to some impressive landsliding into the Strait of Juan de Fuca. Plus, plenty of other inconvenient-to-civilization natural processes accelerated by all of the recent rain. It's a long drive from Olympia to Pysht, and I'm not getting along very well with that town's geologic namesake Formation. My plans to temporarily escape to warmer lands were thwarted by the pandemic, so I'm here for the foreseeable future, trying to remove, reinforce, and contain (and maybe avoid).

### AEG things to do

While you're waiting for your vaccine and enjoying the winter's various offerings for challenge and tribulation, know that AEG has been working away in the background to line up interesting geology talks to keep our Chapter together until we can actually be together again. As you may know from previous pages, at our upcoming Chapter Meeting (2/2), AEG Nisqually will be hosting a presentation on dendrochronology from Jessie Pearl, of the USGS. On February 4, AEG Puget Sound will be hosting a presentation by our own Tim Walsh. We hope to get you a link to that Zoom talk and provide it to the Chapter in an upcoming email. We've also invited Puget Sound to attend Jessie's talk on Feb 2. Rumor has it that, in support of anyone who may be gearing up for the ASBOG Fundamentals of Geology exam on March 19, AEG is planning a webinar to be presented on Monday, Feb. 22, that provides advice and study hints. Again, we will have to follow up with an email, as this hasn't shown up on the [AEG calendar](#) yet. In the meantime, please forward that link along to anyone who may be interested. For our March and April Chapter Meetings, AEG Nisqually will be hosting geologists who are also Earth and Space Science PhD Students at the University of Washington. Elizabeth Davis will be presenting on Seattle's seismic past and updated landslide map and Kelsay Stanton will be telling us about her recent mapping on the coast. I won't say anymore for now. You'll have to do your own digging, or wait for the newsletters!

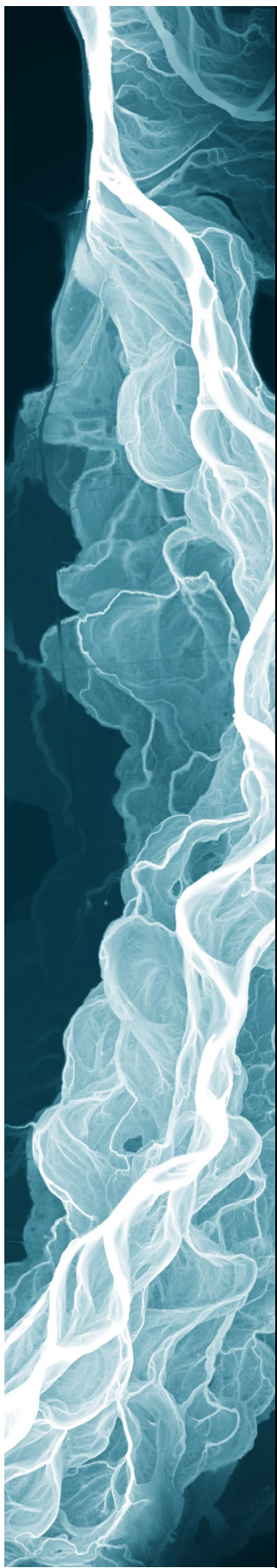
### Please select AEG Nisqually when you renew!

When you renew your AEG membership, be sure to select Nisqually as your Chapter. It puts a few bucks into the Chapter coffers and keeps our numbers up.

It's great to be part of AEG Nisqually! I look forward to seeing you all soon.

Gabe Taylor

[taylorg@wsdot.wa.gov](mailto:taylorg@wsdot.wa.gov)



## Section Officers & Committee Chairs



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WSDOT



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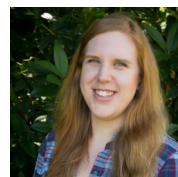
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**National AEG webpage:**  
<http://aegweb.org>

## The AEG Nisqually Chapter Newsletter

The Association of Engineering Geologists (AEG) contributes to its members' professional success and the public welfare by providing leadership, advocacy, and applied research in environmental and engineering geology. AEG's values are based on the belief that its members have a responsibility to assume stewardship over their fields of expertise. AEG is the acknowledged international leader in environmental and engineering geology, and is greatly respected for its stewardship of the profession.

AEG NISQUALLY CHAPTER NEWSLETTER is published monthly from September through April. Subscriptions are for members of AEG affiliated with the Nisqually Chapter or other Chapters, and other interested people. E-mail subscriptions are free.

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