



NORTHWEST GEOLOGICAL SOCIETY

A regional association of professionals, students & others interested in geology
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April 2012 Newsletter

Volume 26, Number 3

April 10 Program Speaker

Speaker: Tom Pratt, USGS at UW Seattle

Title: Fracture mechanics at a large scale: Central Washington's faults, folds, and OWL

Abstract: The Yakima fold and thrust belt (YFTB) is a set of anticlines above reverse faults in the Miocene Columbia River Basalt flows of central Washington State. The YFTB is bisected by the ~1100-km-long Olympic-Wallowa geomorphic lineament (OWL). There is considerable debate about the origin and earthquake potential of the YFTB and OWL, which lie near six major dams and the Hanford nuclear site. The YFTB structures have been compared to "wrinkle ridges" formed by contraction during cooling on other planets and have been interpreted as a simple fold-and-thrust belt formed under N-S compression. The YFTB ridges are cored by faults whose depth of penetration has been debated, with a "thick-skin" model in which the faults penetrate to basement rocks being more recently favored over a "thin-skin" model in which the faults extend only to the base of the ~4-km-thick basalt flows. The OWL may be a major strike-slip fault zone, but lacks definitive evidence for or against substantial horizontal offset. Here I show that the trends of the YFTB anticlines relative to the OWL match remarkably well the trends of the principal stresses determined from Linear Elastic Fracture Mechanics modeling of the end of a vertical strike-slip fault. From this comparison and the termination of some YFTB anticlines at the OWL, I argue that the YFTB formed as splay faults caused by an abrupt decrease in the amount of strike-slip motion along the OWL. If this hypothesis is correct, the OWL and YFTB are likely interconnected, deeply-rooted structures.

5:30pm: No-host social hour

6:30pm: Buffet dinner

7:30pm: Speaker program

All are welcome to attend –
reservations are required
if coming for dinner.

► [Reservations here](#)



PROGRAM DINNER RESERVATIONS: NWGS members: **\$40**; Non-members: **\$45**; Full-time students : **\$20**. \$45 for LATE REGISTRATION. Make your reservation and payment on-line at www.nwgs.org (or mail your payment to *Northwest Geological Society, 4616 25th Ave NE #397, Seattle, WA. 98105* (must be received by Thursday prior to meeting)). Contact [Dan Smith](mailto:Dan.Smith@nwgs.org) at 206-937-5313 or nwgeo@yahoo.com.

If attending the speaker program only, a \$5 voluntary donation to help defray the meeting room cost is requested.

Location: Pacific Dining Hall at the [Talaris Conference Center](#), 4000 NE 41st St., Seattle, WA. Ph 206-268-7000. **Directions:** See [on-line directions with map](#), or: from I-5 northbound or southbound in Seattle, take Exit 168B (NE 45th St.). Drive east on NE 45th St. past UW down the hill and past University Village. Turn south (right) onto Mary Gates Memorial Drive at the 5-way intersection. MGM Drive will curve east (left) and become NE 41st St. Continue several blocks to the [Talaris Conference Center](#) entrance on the north (left) side. We meet in the Pacific Dining room on the left.

Upcoming Speakers and Field Trips

May 8 (joint AWG meeting): Vicki McConnell, Oregon Dept. Geol. & Min. Industries, Everything you always wanted to know about state geological surveys, but whom to ask?

Spring, 2012 Field Trip: Steve Reidel, WSU-TriCities, Late Cenozoic evolution of the Columbia River system in the Columbia River Basalt Province, date either May 5/6 or May 19/20.

Summer, 2012: Possible *Special Edition* field trip to Iceland, dates TBA (see more in Announcements on p. 2).

Fall, 2012 Field Trip: trip and dates TBA.

Please see the [NWGS website](http://www.nwgs.org) for detailed announcements.

Contact webmaster [Julie Masura](mailto:Julie.Masura@nwgs.org) if you have any announcements to post on the website.

Announcements

- **Kathy Troost** (Troost Geological Consulting) has been approved as the 2012 President Elect! Congratulations (and thanks) Kathy!
- A possible *special edition* field trip to Iceland this summer is still in the works, to be lead by a professional Icelandic geologist/tour guide, ~6 days in SW Iceland, ~\$1300 + airfare (\$700-\$1000, more expensive in July/August). If interested, please email Field Trip Coordinator [Matthew Von der Ahe](mailto:mvonderahe@gmail.com) (mvonderahe@gmail.com) with your preferred dates: 1) early June, 2) early July, 3) early August, 4) early September, or 5) summer 2013.
- The 25-year anniversary symposium is now scheduled for **May 4, 2013**. Please mark your calendar!
- NWGS Historian [Donn Charnley](mailto:donncharnley@frontier.com) requests any pre-1980s NWGS information. Contact him at donncharnley@frontier.com or 206.546.3868.
- Next **Board meeting**: April 10, 4:30 P.M., Talaris Conference Center.

YOU would like to be involved!

Photo Spotlight



Oblique view looking NNW from about Selah, Wash. (lower left) towards Ellensburg (upper right) of the central part of the Yakima fold belt. Note the anticlinal ridges and synclinal valleys that are cross-cut by the antecedent Yakima River, with well-developed encised meanders. (Google Earth image.)

About NWGS

NWGS, a regional association of professionals, students & other persons interested in **geology**, provides a forum for the presentation and discussion of a wide range of geologic topics, emphasizing those of the Pacific Northwest of fundamental scientific interest.

YOU would like to be involved!

Program meetings: 2nd Tuesdays, October through May in the Pacific Dining Hall at the [Talaris Conference Center](#) in Seattle (see 1st page). Anyone may attend the speaker program, but a reservation is necessary for those wanting dinner (see 1st page). **Field trips (members only)**: one in late spring/early summer and one in late summer/early fall, usually of 1-3 days in length. **Membership** is open to anybody with a professional or amateur interest in geology. **Annual dues**: Professional: \$30; Student: \$5. **To join or pay annual dues**: send a check payable to NWGS to Secretary [Dan Smith](#), 10203 40th Ave SW, Seattle, WA. 98146. Please include your name, address, home phone, email, and employer/affiliation (if any). Professional dues may now also be paid at www.nwgs.org.

YOU would like to be involved!

Recommended Readings

Reidel, S.P., Campbell, N.P., Fecht, K.R., and Lindsey, K.A., 1994, Late Cenozoic structure and stratigraphy of south-central Washington, in Lasmanis, R., and Cheney, E.S., eds., Regional Geology of Washington State: Washington Division of Geology and Earth Resources Bulletin, v. 80, p. 159-180.

Reidel, S.P., Fecht, K.R., Hagood, M.C., and Tolan, T.L., 1989, The geologic evolution of the central Columbia Plateau: in Reidel, S.P., and Hooper, P.R., eds., Volcanism and tectonism in the Columbia River flood basalt province, Geological Society of America Special Papers, v. 239, p.

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 Secretary [Dan Smith](#) at 206.937.5313. Questions or comments? Contact President [Julie Masura](#).

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