

# NORTHWEST GEOLOGICAL SOCIETY

A regional association of professionals, students & others interested in geology  
Please browse [www.nwgs.org](http://www.nwgs.org) for more about us

## April, 2023 Newsletter

Volume 37, Number 4

### April 11 Program Speaker

5:30pm: No-host social hour; 6:30pm: Dinner  
7:30pm: Speaker program ([reservations here](#), see below for details)

**Speaker:** Peter Davis, Pacific Lutheran University

**Title:** New insights into Mesozoic igneous and metamorphic rocks of the Central Cascades, Washington State

**Abstract:** The Hicks Butte complex, located in the central Cascades, Washington, consist of variably deformed metaigneous rocks, is faulted against the Easton Metamorphic suite that contains high-pressure subduction related mineral assemblages. This contact may have originally been primary as evidenced by a ~500 m wide contact aureole that variably overprints the high-pressure assemblage. The Hicks Butte complex is a 150-153 Ma island arc complex with juvenile mantle melt geochemical signature. This complex was intruded by ~144 Ma adakite which formed deep in the crust by melting of a mafic protolith. The thermal and structural origin of this complex was investigated to help understand its formation. A 153 Ma symplectic gabbro has a mineral assemblage which suggests rapid cooling from 1100 °C to around 700-800 °C at pressures between 2-4 kbar. Amphibole from an adakitic dacite yield temperatures of 934°-946 °C and a pressure of  $5.67 \pm 1.42$  kbar. A dacite that cuts the 153 Ma symplectic gabbro yields a complex LA-ICP-MS U-Pb zircon age of three groups: ~152 Ma; ~144.5 Ma; and, ~137 Ma.

The entire Hicks Butte complex and host rocks display similar steep NW-SE trending structures. Electron BackScatter Diffraction of plagioclase in gabbro revealed a lack of a CPO, suggesting sub-magmatic diffusion creep. Prism-a slip in quartz suggests the symplectic gabbro and intruded dacite deformed together at 550°-650 °C. This mingling shows passive folding which requires high mean ductility with low contrast. The Easton displays a range from basal-a to rhomb-a to prism-a slip (~400-650 °C) and late greenschist overprint on blueschist pulse that define an aureole that matches the P/T cooling path of the Hicks Butte complex and gabbroic symplectite (650 °C & > 6kbars).

The variation in zircon ages and magma generation sources could have resulted by the introduction of fluids from dewatering of metasediments in the underlying subduction channel directly to the lower-crustal root of the Jurassic island arc, possibly exposed due to subduction erosion.

The spread in the zircon data from 144-137 Ma might record incremental pluton inflation that would have produced repeated smaller thermal pulses. This mechanism would restrict the thermal influence of the pluton, explaining the small size of the contact aureole in the Easton host, regional preservation of HP- assemblages, and presence of passive folding, which a single intrusion can't explain in the same time window.

### IN-PERSON PROGRAM DINNER RESERVATIONS!

**Cost:** NWGS member dinner: \$40; Non-member dinner: \$50; Student dinner: \$10; Talk-only: \$10;  
Student talk-only: free

**To register for attending in-person:** please [make your reservation here \(nwgs.org/meeting-registration/\)](http://nwgs.org/meeting-registration/) by the Thursday prior to the meeting.

**Catered menu:** Shepard's pie (gf, df), fisherman's pie (cream-based sauce with onions, carrots, peas, salmon, shrimp, crab, & scallops topped with mashed potatoes), rustic bread with Irish butter, stout gravy (gf, df), garden salad with 3 dressings, Guinness spice cake with maple glaze (gf).

**Location:** Fautleroy YMCA next to the Fautleroy UCC Church, West Seattle, 9140 California Ave SW, Seattle, WA. 98136. Use the parking lot on the [north side of the building](#). Get [Google Maps driving directions here](#).

### Upcoming Speakers and Field Trips

**May 9:** Greg Wessel and Theodore Smith, Education, Geography, & Science Instruction & Consulting, Geology in the Public Interest

**Spring Field Trip:** there are some great options in the works but nothing is finalized yet.

**Fall Field Trip:** TBA

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

Please see the [NWGS website](#) for detailed announcements.  
Contact webmaster [Matthew Porter](#) if you have any announcements to post on the website.

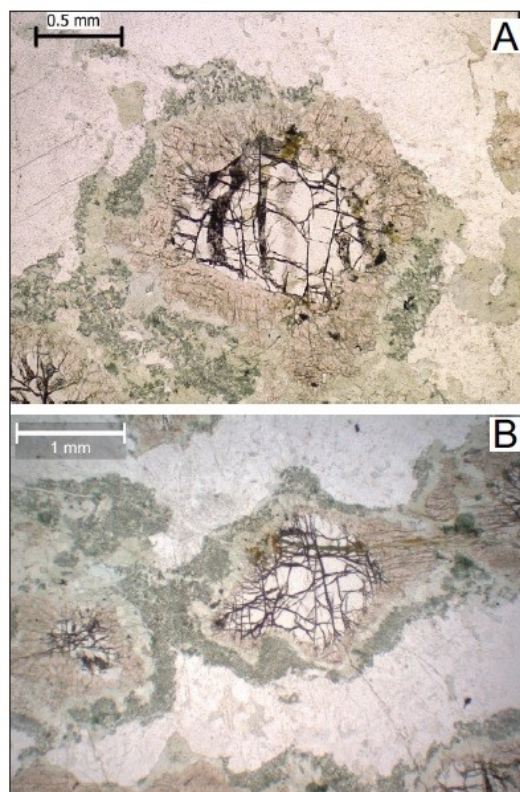
## Announcements

- NWGS is still seeking a talented volunteer to fill the **President Elect** position. The success and future of this fine organization depends on shared governance by its members. The time commitment is not enormous, and this is a rewarding opportunity to contribute to the direction of our fine organization. Please contact President [Francois Lalague](#) for more information.
- We are currently working on filling in the talk and field trip schedules for 2023. Please let [Francois Lalague](#) know if you would like to volunteer or have any suggestions.
- NWGS is taking applications for scholarships for undergraduate and graduate majors in geology or related fields. Please see [nwgs.org](http://nwgs.org) for the application.
- Next Board of Directors meeting:** April 18, 5:30 pm. Members are welcome to attend. Please email [nwgs.secretary.com](mailto:nwgs.secretary.com) for the Zoom link.

*YOU would like to be involved!*

## Photo Spotlight

Thin section of symplectic hornblende olivine gabbro from the Hicks Butte complex. Note the corona of enstatite around the olivine. The symplectic melt can be seen as green-colored material mantling the enstatite. Also displayed are light green amphibole, clear plagioclase, and lesser oxides. P. Davis photo.



## 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 2<sup>nd</sup> Tuesdays, October through May. We are trying a new in-person venue this month at the Fautleroy YMCA in West Seattle, 9140 California Ave SW, WA, 98136. Reservations are required to attend in-person (Member dinner: \$40; Non-member dinner: \$50; Student dinner: \$10; Talk-only: \$10; Student talk-only: free).

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

**Membership** is open to anybody with an interest in geology. **Annual dues:** Professional: \$55; Student: \$10. **To join or pay annual dues:** go to the [NWGS website](#), or visit our website for more details. We look forward to seeing you soon!

## Recommended Readings

Haugerud, R. A., and Kelsey, H. M., 2017, From the Puget Lowland to East of the Cascade Range: Geologic Excursions in the Pacific Northwest, GeoScience-World, DOI <https://doi.org/10.1130/fld049>.

MacDonald, J. H., Jr., Dragovich, J. D., Pecha, M. E., Thompson, G. T., Stingu, S. C., Maruszczak, A. D., Zalud, K. M., Milliken, S. H., 2017, Mesozoic terranes of the central Cascades: Geology of the Hicks Butte complex, Easton Metamorphic Suite, Peshastin Formation and Ingalls ophiolite complex, GeoScienceWorld, DOI [https://doi.org/10.1130/2017.0049\(05\)](https://doi.org/10.1130/2017.0049(05)).

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

To update your account information, go to [NWGS.org/membership](http://NWGS.org/membership).  
Questions or comments? Contact President [Francois Lalague](#).

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