National Association of Geoscience Teachers

Pacific Northwest Section

Winter 2024

Greetings from the President

Craig Nichol,
Section President,
University of British Columbia Okanagan

I hope everyone is off to a great start in 2024. The fall just seemed to have flown by, and here we all are in a winter that hardly seems like one. It has been a steep learning curve for me taking over the section from the very capable and enthusiastic Derek Turner, who thankfully carries on with the section in the Past-President and OEST Coordinator roles. Make sure to read his report on the 2023 AGM he hosted. We did some reaching out in late fall to see what members would like to see from their section and we will have some talks coming up based on those member inputs. We will be helping out NAGT National and the Far West section with a booth at the GSA Section meeting in May in Spokane. I am also looking forward to the annual meeting in June hosted by Yakima Valley Community College. Some amazing plans are taking shape, with more details to come.

This year, I have been part of a national Ad Hoc Sections committee. Some lapsed sections have been restarted and some section boundaries were redrawn to be closer to GSA section boundaries. The committee has created resources to help existing and new sections modernize their bylaws and we will be working on updating our PNW bylaws to match. There are efforts to arrange for section elections to be incorporated into the national online elections process with fixed timing each year starting in early summer. This will help national better support sections with coordinated training for section leaders. More details will follow later in spring. A reminder that we are always on the lookout for people, so please reach out to any of the executive if you would like to become involved.

At the national level, there is always so much on the go so make sure you visit the website and check your emails for announcements. This year, the Earth Educators Rendezvous will be in Philadelphia from July 15 to 19,

after which Rendezvous will change to being held every second year. The amazing work that goes on in the morning EER workshops has led NAGT national begin offering multi-day workshops online starting this spring.

Overall, I am excited to see what the new year has to offer and look forward to seeing folks in Yakima.

2024 NAGT Pacific Northwest Section Conference! Yakima, WA, June 17-19, 2024

Come visit the hop capitol of North America! Our annual PNW-NAGT meeting will be held in Yakima, WA this year, from June 17-19, 2024. Presentations and business meeting will take place on June 17 on the Yakima Valley College campus. This will be followed by two days of trips to experience the regional geology. Look for details in future newsletters and emails. Depending upon weather/snowpack and interest, we may offer a three-day camping experience around Mount Rainier following this meeting. If you have ideas or requests, please feel free to reach out to the planning committee.

Suki Smaglik (suki.smaglik@gmail.com)
Zach Schierl (zschierl@yvcc.edu)
Katharine Solada (ksolada@yvcc.edu)

Yakima Valley Community College

2023 NAGT PNW Section Conference in Vancouver, BC

Derek Turner, Douglas College

The NAGT-PNW section held our annual conference this past June in Vancouver, BC. There were two field trip days, separated by a day of talks, workshops and meetings at Douglas College. Fifteen NAGT members participated over the three days from across the Pacific Northwest. The first field trip day explored the geology of the Sea to Sky Highway that connects Vancouver with Whistler. The first few stops looked at the risk posed by debris flows to this busy transportation corridor and the retention structures built to mitigate that risk. We then investigated the relationship between the active volcanism and the ice sheet that covered the area during the Late Pleistocene. Even with all that, we still had time to stop by a local brewery and test if the beer reflected this chaotic geologic past! Our busy conference day was packed with workshops and talks on such topics as the challenges and opportunities of running remote field schools and reflecting on Truth and Reconciliation in the context of geoscience education, as well as some business meetings. Our second field trip day traveled east, looking at the events and consequences of the large atmospheric river event in 2021, which caused widespread flooding and mass wasting across the region. We also had the chance to go underground into the Bear Mountain Mine, a small active gold mine near the shores of Harrison Lake. I would like to thank all the participants that made this meeting such a success and encourage members to join us at the next meeting!

Group photo in front of a glacially eroded outcrop along the Sea to Sky Highway (C. Nichol)

The Ranger Run failure, exposing Late Pleistocene stratigraphy near the Chilliwack River. (Zach Schierl)

Subglacial columnar basalt near the Sea to Sky Highway (D. Turner)

Inside the Bear Mountain Gold Mine (Zach Schierl)

Awards Reminders

OEST award deadline is March 1. Contact Derek Turner (turnerd1@douglascollege.ca) to nominate a teacher or for more information.
Outstanding TA award nominations deadline is June 15. More information at https://nagt.org/nagt/awards/ta.html
NAGT Awards https://nagt.org/nagt/awards/index.html

A Trauma-Informed Geoscience Curriculum?
By Crystal Huscroft, Associate Teaching Professor, Thompson Rivers University

A couple of years ago, I never would have guessed that I would write the words "trauma-informed" and "geoscience" in the same sentence. So, it was with a false sense of professional complacency that I registered for a PD session entitled *"Trauma-Informed Teaching and Indigenization"*. I thought the topic of trauma intersected more readily with the curriculum of my colleagues in the social sciences and humanities. Never did I think that my geoscience courses could play a role in trauma resiliency, but now I understand that they can.

The session started with an exploration of the causes of trauma for Indigenous people. As I expected we would, we discussed the cascading impacts of trauma caused by the legacy of the residential school system, land dispossession, and other causes of intergenerational trauma. But then the facilitator, Laura Grizzlypaws, surprised me by speaking of how traumatizing the drought this summer had been for her community. Harvesting salmon at a site near her community was an important cultural practice that brought the community together and connected them to each other in vital ways. In a typical year, as salmon attempted to jump past a hydraulic jump from one pool to the next, they used dip nets to catch the salmon, sometimes in midair. The catch would then be distributed within the community to those that could use it with special attention to ensure Elders got what they needed. However, this year the drought severely impacted flow temperature, timing, and volume. So, the salmon couldn't make it up past their site. Ultimately, the community made the heart-breaking decision to excavate and destroy their site to preserve their salmon run. As I listened, I started to see how stream hydrology and geomorphology contributed to culture, abundance, and community in tangible ways. When Laura spoke of how "You lose salmon, you lose who you are" and "loss of connection to land causes loss of culture", I became concretely aware of the links between hydro- and geo-environmental health, cultural health, mental health, and trauma. I also started thinking that "trauma-informed teaching practices" applicable to my geoscience courses would need to accommodate the fact that I have students that are culturally sensitive environmental learners.

But what do I do about geoscience learners experiencing trauma due to increasing disconnection with their culture? How do I (a white woman who is a newcomer to this area) help? Initially, I didn't think I could play a role in that "department" because I'm not Indigenous. It wouldn't be appropriate or possible for me to teach cultural practices. Then, she stated that "strengthening students' cultural identity is a form of empowerment" and can help them be

more resilient to trauma. Could I help students strengthen cultural identity? Could I help them assist their communities in telling their own narratives? If so, this didn't sound like the science classrooms that I had been a part of. And maybe that is the problem.

Now that two months have passed since the workshop, I've implemented some changes. I'm creating opportunities for students to exert some choice over what geoscience they learn and developing capacity to support the use of Indigenous research methods for students to strengthen their cultural identity. Practically, this means that for my course research projects I have invited all the students in my class, and my Indigenous students in particular, to choose culturally relevant topics. I see three main types of topics that lend themselves to both my lower and upper-level courses differentially. As a reminder, I am a total novice learner with respect to Indigenous geoscience, so this list will hopefully grow. For now, I see that student research project topics could be of three types: 1) braiding western and Indigenous science, 2) highlighting examples of community resilience with respect to environmental geohazards or mineral resource planning, and 3) exploring language-based traditional geoscientific knowledge.

Researching the intersections between cultural knowledge and geoscience could look at the geoscience behind traditional stories. For example, my university is located on the unceded territory of the Secwépemc Nation and their oral creation story history describes the Holocene Hyspithermal conditions that correlate to their post-glacial regional arrival. Also, one of their traditional stories correlates to sequential damming site of the late Pleistocene deglacial lake that occupied the valley I live in (Ignace & Ignace, 2017).

Researching topics that highlight examples of resilience within Indigenous communities in both contemporary and traditional practices will likely relate to what western science calls "geohazards", but local communities may refer to as the behavior of kin (mountains, streams, lakes and forests). Topics could include contemporary Indigenous flood mitigation, Indigenous groundwater stewardship, geohazard planning, the positive impacts of implementing and rejuvenating traditional and/or contemporary Indigenous-led management practices for wildfire, soils, stream erosion, and the implementation of community renewable energy systems.

Exploring traditional geoscientific knowledge could include a project that supports language revitalization. For instance, a student could explore the cultural geoscientific knowledge inherent in their Indigenous language. In Secwépemctsín (the language of the Secwépemc Nation) geomorphology is so embedded in the everyday, that there is a geomorphological grammar where common syllables in a place name refer to a slope steepness in relation to the steepness of the adjacent slopes.

As outlandish as this idea initially seemed to me, I am starting to see how, if done in a good way, taking a geoscience course could contribute to resiliency for Indigenous students. An important key to this is doing it in a "good way." This requires me to become more knowledgeable about protocols for proper research methods when students show interest in using and exploring Indigenous knowledge. So, I am committed to taking the time to do things properly. Nonetheless, in terms of curriculum, the key is looking for opportunities for Indigenous students to explore the "common ground" between geoscience, their identity and their perspectives (Stephens, 2000). I see space in my courses to set out a blanket of opportunities and an invitation to students to delve into this "common ground". So, my first responsibility is to learn more about the intersections myself. I would love to partner with anyone else on the same journey.

Acknowledgements

I'd like to acknowledge that I live, learn, love, and work on the unceded territory of the Tk'emlúps te Secwépemc within Secwepemcúl'ecw. I thank the Secwépemc Nation for their gracious hospitality.

I would also like to acknowledge the mentorship of Laura Grizzlypaws of the St'át'imc Nation. She is an Educational Developer in Indigenous Teaching & Learning at Thompson Rivers University, a dancer, drummer, singer/songwriter, an academic, educator and a language and cultural advocate. If you ever get the opportunity to spend time with her, do it. Finally, I would like to acknowledge that my discipline of geoscience has been integral to the dispossession of Indigenous lands, safe water, clean air, healthy soils and vital cultural practices. "I accept the responsibility of working within the context of this legacy, moving forward in a good way." I would also like to acknowledge my former student, Jeff Campbell, for modelling how to express this in my acknowledgements.

References

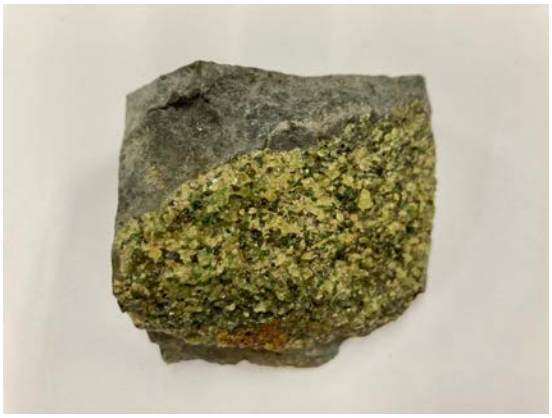
Ignace, M. Ignace, R. 2017. Secwépemc People, Land, and Laws Yerí7 Re Stsq?ey?s-Kucw. McGill-Queen's University Press. 624.

Stephens, Sidney 2000. Handbook for Culturally Responsive Science Curriculum. Fairbanks: Alaska Native Knowledge Network.

Mantle Xenoliths from South Central British Columbia
Katie Withrow, University of Victoria

These are mantle xenoliths from the West Kettle River area east of Kelowna, British Columbia. They were part of the lithospheric mantle beneath the Cordillera then plucked, transported and emplaced by a basalt lava ~1.2 Ma. I'm a grad student at UVic studying the element partitioning between the minerals to get at the conditions of the mantle at that time to try to understand what has been happening thermally beneath the Cordillera.

West Kettle mantle xenolith under reflected light, magnified 40x (olivine, orthopyroxene, clinopyroxene, chrome spinel; a typical mantle peridotite). (Katie Withrow)



Whole rock sample showing the xenolith and host basalt. (Katie Withrow)

My favourite field hand. (Katie Withrow)

NAGT-PNW Speaker Series (online)
March 21 @ 7:30 pm
Title TBA
Andrew Megis - Cascadia Region Earthquake Science Center (https://cascadiaquakes.org/)
https://ubc.zoom.us/j/66769051158?pwd=TkpEbWZNWjJZeHcrMTVDUjBRRjN0UT09

2024 Joint Cordilleran and Rocky Mountain Section Meeting of the GSA
May 15-17
Technical Sessions and Field Trip
info: https://www.geosociety.org/GSA/GSA/Sections/cd/2024mtg/home.aspx

Our PNW section is looking for volunteers to help at our booth, contact Craig Nichol for more information (craig.nichol@ubc.ca)

NAGT Professional Development Workshops (online)

Geoscience Teaching & Learning in the Time of AI
Feb 22, 1-2 pm PT
https://nagt.org/nagt/profdev/workshops/ngss_summit/feb222024/index.html
Dive into the future of geoscience education. Work with AI techniques aimed at boosting student engagement, deepening understanding, and unleashing creativity in your classroom. We'll explore practical tools and strategies to get started, even if you're new to AI. Through a brief theoretical introduction and a compelling rationale for AI integration, you'll gain a clear vision of its potential in your classroom.

Mentoring for Student Success
April 3, 10, 17 & 24, noon-2 pm PT
https://nagt.org/nagt/profdev/workshops/online/mentoring/index.html

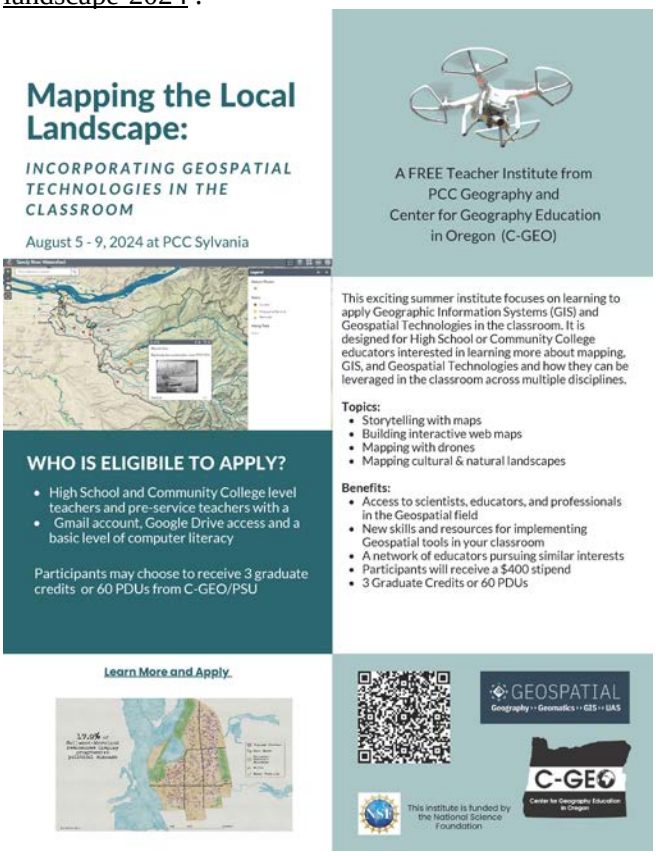
Do you mentor undergraduate or graduate students in research in the Earth sciences, geoscience education research, or related fields? Are you interested in improving your mentoring skills? This workshop is designed to equip mentors from diverse backgrounds with the tools and insights to support all students in being successful. We will discuss identity and mentorship, establishing expectations, communication strategies, and developing mentoring networks and development plans. You can expect a highly interactive, synchronous online workshop in which you will get to know and learn from your colleagues and the workshop leaders. Read more about the workshop goals and expectations.

SCHOOL of ICE, Summer 2024
July 21-25
Oregon State University, Corvallis. OR

Professional development workshop for climate change and ice core related science. Please consider applying! Your travel costs and all teaching resources are included.

Who: Faculty at 2-4 year Minority Serving Institutions, Community Colleges, and AP High School science teachers
How: Apply Here

Workshop: Incorporating Geospatial Technologies in the Classroom.
August 5-9
Portland Community College, Sylvania Campus
The Portland Community College (PCC) Geography Department and the Center for Geographic Education in Oregon (C-GEO) are offering an NSF funded professional development opportunity this summer Educators will learn how to create and use Story Maps to build interactive maps, be introduced to drone mapping and more. Participants will receive a $400 stipend and can earn 3 graduate credits of 60 PDUs. Apply at https://www.surveymonkey.com/r/mapping-local-landscape-2024 .



Tobacco Root Geological Society 48th Annual Field Conference
July 27-30, 2024
Salmon, Idaho

This meeting also serves as the 6th installment of the Belt Symposia

https://www.trgs.org/2023-field-conference-salmon

Ice Age Floods of the Pacific Northwest: A Photographic Exploration
Feb 20, 7 – 8:30 pm PST
Bruce Bjornstad, Ice Age Floods Institute
https://www.iafi.org/event/ice-age-floodscapes-of-the-pacific-northwest-a-photographic-exploration/

Earth Educators' Rendezvous 2024
July 15-19, Philadelphia, PA
https://serc.carleton.edu/earth_rendezvous/2024/index.html

Our program is designed to appeal to everyone from **instructors and graduate students** attending their first Earth-education-themed meeting, to experienced STEM education **researchers**, to **administrators** who want to better support students in their programs. Among many options, participants can learn about new teaching approaches, discover opportunities to get involved in research programs, prepare for an academic career, or discuss how to approach teaching and learning challenges in their classroom.

Western Division, Canadian Association of Geographers Annual Conference

March 15-16,
Okanagan College, Kelowna, British Columbia

Geographers from all fields and related disciplines are invited to attend and present. The theme of this meeting will be 'Relevance'. Relevance is what makes geography powerful. Geographers are in important positions in government, business, and the community. We have insights that recognize challenges others may not, and we provide solutions. We understand why solutions that work in one place might not work in another. We make connections and see the big picture. We invite participants to reflect on how our work is relevant, whether to society, a community, a government department, an employer, or to our own development.

https://www.cag-acg.ca/wdcag-2024-home