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Thawing Ground

A bimonthly newsletter of the US Permafrost Association

The mission of USPA is to encourage sharing knowledge and data in permafrost science.

In this issue, we discuss new article on cryoplanated uplands, meet members Kaytan Kelker and Kevin Schaefer, get some advice from Ed Clarke quiz you on permafrost history, and let you know where we could use a little help.

The Active Layer

You mean sorted patterned ground *isn't* quiescent? *Really?*

Really. Graduate student Raven Mitchell, USPA Life Member Fritz Nelson, and previous USPA Board Member Kelsey Nyland recently published “Little tools, big job: The periglacial conveyor system in cryoplanated uplands” in *Permafrost and Periglacial Processes*. They used drone surveys, hydrologic modelling, and sedimentological and geomorphometric analysis to demonstrate that periglacial patterned ground plays a key role in water and suspended sediment transport on cryoplanation terraces. Their work challenges the traditional view that patterned ground is geomorphologically quiescent and offers a qualitative model for sediment transportation, i.e. a conveyor system. The article is available via Creative Commons [here](#). Check it out.

The Active Layer is our main story and highlights recent work done by our members.

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L to R: Kelsey Nyland, Raven Mitchell, and Fritz Nelson

“Back in my day....” (sound advice from our “older” members)

Prior to the Trans-Alaska construction we needed to build a work pad to support the pipeline laying traffic. In the past, 5 feet of gravel had been used to insulate the frozen permafrost. The above ground section of the line north of the Brooks Range was approximately 90 miles indicating an enormous amount of gravel. The design called for one or more layers of polyurethane insulation with 2 feet of gravel.

As we started to build the work pad, we observed that the insulation was sliding on the snow cleared tundra. We tried several techniques to prevent this movement such as slowing the dozer. We observed that a higher pile of gravel seemed to reduce the insulation sliding. We developed a procedure called a rolling surcharge which reduced if not eliminated this problem. We used a 5-to-8-foot pile of gravel at the advancing front of the work pad which eliminated the slippage of the insulation. An evaluation post construction showed that this technique was successful.

Ed Clarke *Thank you, Ed, for this great advice.*

“Once the damage is done, it’s irreparable, because the exposed permafrost thaws even more with every summer.” Thomas Opel, AWI



Megaslump in Batagay, Siberia. Fair Use and Fair Dealing

Featured Board Member: Kevin Schaefer

Kevin is a senior research scientist at the National Snow and Ice Data Center at the University of Colorado. Kevin studies permafrost dynamics using modeling, remote sensing, and in situ measurements. Kevin also studies how carbon and mercury released from thawing permafrost impact global temperature and the global mercury cycle. In his free time, Kevin enjoys hiking, biking, and running with his wife and is training for the 2024 10k Bolder Boulder race. Kevin’s hobbies include woodworking, wood carving, and photography.



Above: Kevin and colleagues impersonating Bruce Springsteen & The E Street Band

Below left: Kevin busy in the field



Kaytan doing some serious field work!

“My motivation to pursue a Ph.D. is driven by my goal to become a leading researcher whose research improves hazard mitigation in permafrost-affected mountain environments that are currently being impacted by climate change. No better natural laboratory that Alaska exists, where one can observe the dynamic ongoing effects of climate change on the permafrost landscape firsthand.”

Kaytan Kelker

Featured Member: Kaytan Kelker

Kaytan is a Ph.D. student at the University of Alaska Fairbanks. His primary research interests are in periglacial geomorphology focused on landslides propagated by mountain permafrost degradation, rock glacier dynamics, and modeling mountain permafrost distribution. Kaytan decided to pursue mountain permafrost research after observing high-mountain periglacial landforms in the San Juan Mountains of Colorado during his Master’s fieldwork. His passion lies in answering challenging research questions to further our knowledge of how mountain permafrost regimes are altering high-elevation hydrology and landscape evolution. Kaytan is grateful to USPA’s support facilitating his travel to AGU 2023 where he presented his work based in the Alaska Range. He will present his ongoing Ph.D. research at the International Conference on Permafrost (ICOP) 2024 in June in Whitehorse, Canada. Kaytan is currently serving on the Executive Committee 2022-2024 of the Permafrost Young Researchers Network (PYRN).

“My graduate research career has enabled me to build vital collaborations in the wider community and within the USPA. For me the USPA has been a vital sounding board to share research ideas and knowledge. Such discourse is the steppingstone to address and solve critical permafrost-related research questions.”

Permafun Corner

How old is the oldest permafrost on record, located in Batagay, Siberia (see photo at left) and reported upon in 2021?

The oldest known permafrost is around 650,000 years old and was discovered by a team of German, English and Russian scientists in Batagay, Siberia.

Source

We Need Help!

Many of you have skills and experience that will help us improve USPA. You can contact us to find out what’s involved before making a commitment. Right now: We are upgrading our website to make it more enticing and user-friendly. **Got website skills?**

Contact Julian Dann at jdann@alaska.edu.

We want to hear from you!

How are we doing as your professional organization? What can we do differently, better, or faster? Please contact Secretary Katherine Schexneider at secretary@uspermafrost.org.

A HUGE THANK YOU TO OUR CORPORATE AND INSTITUTIONAL MEMBERS!



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