The UPP Newsletter

A bi-monthly newsletter about the people and activities of the USGS-PSU Partnership, water science in Oregon, and related topics.

Coming Up:

- **Register Now for UPP Happy Hour:** Reconnect with your UPP colleagues! **Feb 17th, 4:15-5:15 PM**. Please RSVP here.
- **Call for Proposals for STATS 570 -** Students will be paired into teams to solve a real statistical or data scientific problem. The selected proposals will have their statistical problem dealt with by two-three MS statistics student and a Data Science undergraduate student Click here for more information. **Proposals due March 7th.**
- **Guidelines for UPP Graduate Tuition Remissions -** PSU students working on joint USGS-PSU research projects and USGS employees currently pursuing graduate studies at PSU are eligible for tuition remissions. Click here for more information.

Gully at Silk Creek Landslide muddied by landslide sediment. Photo provided by Adam Booth.

- **USGS Oregon WSC Lunchtime Seminar Series: Alaska Science Center -** **Tomorrow, Feb 1st at 12 PM PST.** Josh Koch, Hydrologist, will present "Icefields to Oceans: a mutli-disciplinary project highlighting unique conditions in Alaska and commonalities with other Western Science Centers". Meeting access link: click here. This is an ongoing seminar series with dates scheduled regularly through April 5th. Click here for more information on the series and upcoming dates.

- **UPP Symposium Rescheduled** The next UPP Symposium will be held in conjunction with PSU's Research Week during the first week of May. Stay tuned for more information!

Safety and Security Anouncement

The UPP is addressing the spike in safety and security issues on campus, particularly for those who work in the Science and Education Building (SEC) and use the Montgomery Lot next to Parking Structure 3. Incidents of theft, vandalism, harassment, open drug use, and hazardous trash have been increasing. PSU's Campus Public Safety Office (CPSO) has increased regular patrols around both areas, including an early morning patrol, and the Facilities department is providing a daily early-morning sweep around SEC to pick up trash. Improved lighting, more video cameras and new signage are on order for the Montgomery Lot, and additional parking options are being investigated. PSU and USGS leadership are meeting monthly to ensure progress on all fronts. PSU is also coordinating closely with the City of Portland, Metro and Oregon Department of Transportation (ODOT), which is critical due to the complexities of land ownership and area responsibilities around PSU and downtown in general. Both USGS and PSU take safety and security very seriously, and are working collaboratively on finding solutions to these problems as quickly as possible. Any USGS or PSU employee can request officer assistance or a Safety Escort from CPSO 24/7 by calling 503-725-4407. If you need to report an incident or would like to learn more about our efforts to address these issues, please contact Alex Etheridge at USGS, aetherid@usgs.gov, or Alison Hopcroft at PSU, hopcroft@pdx.edu.

Giants in the Cascades

By: Luke Hanst

I sat down with a team of scientists who are using UPP Seed Grant funds to study what we might conceptualize as Tolkien-esque stone-giants engaged in an endless process of carving apart mountains and transforming large swaths of territory. Adam Booth, a PSU scientist on

PARTNER PROFILE

Cary Lindsey
Geothermal Energy, Geostatistics, Heat Transfer
USGS Geology, Minerals, Energy, and Geophysics Science Center

Biography: I have a PhD in geology from the University of Idaho where I studied the characterization of heat and fluid flow in geothermal areas. My primary field site was in Yellowstone National Park and I worked in the Basin and Range as well. After UI, I completed a postdoc at the University of Nevada Reno Great Basin Center for Geothermal Energy where I worked on international geothermal assessment type projects in Argentina and Peru.

What do you do? I use statistics and machine learning tools to better assess geothermal potential

the team, would more correctly identify these giants as multi-mile-long landslides with transformative and sometimes destructive power. Adam is joined by Hank Johnson and Steve Gingerich from USGS in a collaborative effort to understand how surface water and groundwater interact with one another to control the speed of landslides.

Adam, Hank, and Steve will be presenting their research alongside the other UPP 2019 Seed Grant recipients at the UPP Symposium currently scheduled for the 1st week of May, so I won't spoil the details of their discoveries here. The short of it is that Adam, Hank, and Steve want to understand whether surface water runoff in streams and gullies drains or recharges groundwater in slow-moving landslides. If surface water runoff drains groundwater, then it contributes to the stabilization of landslides. If surface water introduces more groundwater, then it contributes to the destabilization and acceleration of landslides. The scientists hope that better understanding the mechanisms behind landslides will contribute to improved modeling that will aid community managers. Plus, studying giant glacier-like streams of rock and soil is pretty cool.

But I was interested in something even more powerful than stone-giants… the power of teamwork, friendship, and cross-institution collaboration. How is it that an unlikely trio composed of a hillslope geomorphologist (Adam), a geochemist (Hank), and groundwater hydrologist (Steve) might find themselves working together to overcome wildfires, a global pandemic, and data-privacy laws? The answer: a collaborative research community and a little bit of chedda provided by the UPP Seed Grant Program.

Science requires money, and scientists and their equipment aren't cheap. So without the help of the 2019 UPP Seed Grant, the intrepid team wouldn't have ventured into the Cascadia wilderness. Each year the UPP Seed Grant program supports joint research between PSU and USGS staff by providing research funding and, as of the most recent round of funding, a graduate student tuition remission. The 2023 seed grant program will be accepting proposals in summer 2022, so keep your eyes peeled. Back in 2019, Adam saw UPP's request for proposals and reached out to Hank and Steve in what would become

in the U.S. Most of my research focuses on refining and applying geostatistical techniques to get the most predictability from data. I spend a lot of time looking for trends and patterns in data that allow us to get the maximum amount of information with the least amount of uncertainty.

Why do you do what you do? Many people choose geology as a major and then choose a discipline within geology that they enjoy. I chose geology because I wanted to study geothermal energy. I was initially drawn to this as a renewable energy option, but quickly discovered that it is also a nexus for some really cool fields of research. From your standard hard rock geology to heat flow and hydrogeology. It's a very dynamic field to be part of.

Why should others care that you do it? Most people care about what I do because they assume I know where all the good hot springs are. Truth is, people should care about what I do because it is important that products and models we use to assess resources within the U.S. are as informative as we can possibly make them and

a years-long collaborative fellowship.

Pursuing this research has built ties between Adam, Hank, Steve, and the broader UPP community. Hank and Steve agree that the project has been a great opportunity to network with PSU faculty and staff while learning about the different research programs of their coworkers at USGS. The trio hopes that the increased familiarity will make future collaboration easier and more common.

The team's journey into the Cascades was eventful. Set to embark in the summer of 2020, the researchers were delayed by wildfires that ravaged the Detroit lake area and a global pandemic that kept folks indoors. When the smoke settled, Hank, Adam, and Steve led a caravan of six cars into the mountains, which allowed them to abide social distancing guidelines.

Some challenges arose closer to home for the researchers. The landslide in question is owned by a private company, which means any data collected is under the private company's control. However, as USGS employees, any data produced by Hank or Steve must be made public. The team found a workaround when the lumber company agreed to provide their own hydrologists, allowing Hank and Steve to maintain an advisory role. After two trips into the mountain, the team headed back to the Shire to rest and analyze their data.

With their publication set to release in February of 2022, the team now have their eyes on other projects. Steve is excited to launch his model of groundwater flow in the Harney Basin after many years of preparation. Hank is excited to analyze five years of data collected in the Umatilla region and the Walla Walla Basin. Adam is excited to dive into data collected during his fellowship in Iceland looking at bedrock landslides. All are true scientists at heart, excited by the opportunity to finally dig into their datasets.

Expect to hear from more UPP Seed Grant recipients in the next few months as we gear up for the Research Symposium at PSU's Research Week in the first week of May. Stay tuned for more information!

that's what I try to do with my work.
What would you be doing if you weren't in your current job? If I didn't have my job at the USGS, I would likely be in a tenure track position at a university. I enjoy working with students and getting them fired up for research. That's one of the reasons UPP is so great. I get to be at the USGS and still be involved with students.
Any hobbies? I have recently taken up bird watching. The PNW is a great place to start! I also enjoy traveling, cooking, reading, and being the loudest fan in the stands for my kids.

Monthly Read:

A massive experiment in Taiwan aims to reveal landslides' surprising effect on the climate: Landslides are reactors for chemical weathering that can both draw down and emit carbon.
Most atolls will be uninhabitable by the mid-21st century because of sea level rise exacerbating wave-

UPP Partner Publications:

We are excited to offer a new segment in the UPP newsletter in which we will be sharing recent publications from the UPP community. If you have any recent publications to share, please let us know using this Google Form.

Arun Pallathadka (PSU), Heejun Chang (PSU), & Idowu Ajibade (PSU). (10/2021). The spatial patterns of pluvial flood risk, blue-green infrastructure, and social vulnerability: A case study from two Alaskan cities. *International Journal of Geospatial and Environmental Research*, Vol 8(3). https://dc.uwm.edu/ijger/vol8/iss3/2

Emily Smoot (WWU), & Kelly Gleason (PSU). (12/2021). Forest fires reduce snow-water storage and advance the timing of snowmelt across the Wester U.S. *Water*, Vol 13(24). https://doi.org/10.3390/w13243533

Melissa Haeffner (PSU), et al. (1/2022). Never ask for a lighter rain but a stronger umbrella. *Frontiers in Water*, Vol 3. https://doi.org/10.3389/frwa.2021.822334

driven flooding.

Snow can disappear straight into the atmosphere in hot, dry weather: mysterious process of sublimation can result in water heading not to river flows but back into the air.