

## **EES Field Course to Idaho and Wyoming, 2015**

In May, 2015 14 intrepid young EES students joined Dickson Cunningham and Stephen Nathan on an 11-day field course to Idaho and Wyoming. The trip was the culmination of a new EES course on continental tectonics taught during spring, 2015. Many of the topics taught during the semester were reinforced on the trip in one of America's great geological playgrounds.

We flew to Boise and then headed SE to Twin Falls where we first examined the Miocene expression of Snake River Plain volcanism, including the stunning rheomorphic ignimbrites at Grey's Landing and the flood basalts and rhyolites along the Snake River gorge. Prior to the first outcrop stop, I warned the students that it was rattlesnake season, so they should be on the lookout. Then at our first stop, I nearly stepped on one only 20 feet from the van!

Next we headed to Craters of the Moon National Monument where we were treated to some of the most stunningly raw volcanic landscapes on Earth. We hiked various trails and saw different types of lavas, cinder and spatter cones, tumuli and other manifestations of pahoehoe inflation and deflation. We also explored the dark underworld in some of the park's large lava tubes.



We then headed NE and left the Snake River Plain and entered the Lost River Valley where we were introduced to the tectonic history of the Cordilleran fold-and-thrust belt in the Lost River Range. Highlights included the beautiful folds observed in the high mountains around Borah Peak and the spectacular 1983 M=6.9 Borah Peak earthquake rupture. This reminded us that Basin and Range extension continues in eastern Idaho and that we were in a tectonically active region. We drove up into the mountains west of the valley and hiked up to see some of the folded Carboniferous stratigraphy and were treated to glorious views of the distant Sawtooth Mts – and at foot level, our second rattlesnake!

We then crossed the Snake River Plain heading E on a long day to West Yellowstone. On the way we had a great hike up to the Menan Buttes tuff cone, viewed the magnificent Mesa Falls on the edges of the Island Park Caldera and saw the famous Madison Landslide which provided a very visible lesson on the risks of co-seismic landslides in mountainous regions.



Spectacular pahoehoe flood basalts, Craters of the Moon, Idaho.

We then spent 2 days in Yellowstone National Park and took in all that we could in one of the world's most spectacular geological settings. Of course we visited and walked through many geyser basins and geothermal areas. Old Faithful didn't disappoint, Mammoth Hot Springs' travertine terraces were beautiful and we were enthralled by the azure-blue thermal pools along the shores of Yellowstone Lake. We were equally awed by the thunderous Upper and Lower Falls of the Yellowstone River and the colorful hydrothermally altered silicic volcanics of the Yellowstone Gorge. In Hayden Valley, bison posed for our cameras and we saw elk and coyotes, but we apparently were 1 minute late for a grizzly sighting – however the students didn't complain!

We thoroughly enjoyed Yellowstone and were careful not to rush through it. We spent a lot of time discussing the prevailing hot spot theory and the volcanological and geomorphological record of 'super-eruptions'.

We then drove south to Jackson and enjoyed viewpoints in Grand Teton National Park and then hiked around the famous Gros Ventre landslide. We spent an enjoyable evening eating and wandering around the shops in the fun tourist town of Jackson, Wyoming. The next day was a bit rainy and views at first were limited, but we stuck to our schedule and took the boat across Jenny Lake and hiked up Cascade Canyon in our soggy raingear. Once we arrived at the flat floor of this beautiful hanging valley, I reminded





**EES field trip participants** with the Lower Falls of the Yellowstone River behind us. From L-R – back row: Samantha Boyle, Michael Dolde, Josh Bartosiewicz, Michael Lundquist, Greg Minchik, David Seitlinger; Dan Grondin, Stephen Nathan; L-R front row: Brian Wicks, Robert Looney, Kurt Stefancyk, Jenny Petrario, Victoria Szamocki, Lindsey Belliveau, Jimmy Malcolm, Dickson Cunningham.

the group to keep their voices down because there is reportedly a lot of wildlife in the area. Then, 5 minutes later, we entered a meadow and there was a moose only 50 feet away! If only my geology predictions were as accurate as my wildlife predictions! On the hike, we examined the Precambrian gneisses and various intrusive masses. We also saw marmots, pikas and a fisher. The clouds also lifted and we were rewarded with gorgeous views of the castellated peaks of the high Tetons.

The next morning we rode the tram up to 10,500' Rendezvous Peak. In late May, it is still winter at the summit and we were in the clouds and a snowstorm for most of the time; we mostly shivered in the hut drinking cocoa surprised to be back in winter. We did have a few sunny breaks in the clouds and we examined the nearest outcrops and were surprised to find many drusy vugs with beautiful quartz crystals in many of them.

And then it was a long 6-hour drive back to Boise, and home. The trip was a wonderful experience for all of us and we will surely run it again in the future. There are few places in America that offer such diverse and exciting geology as Idaho and Wyoming.





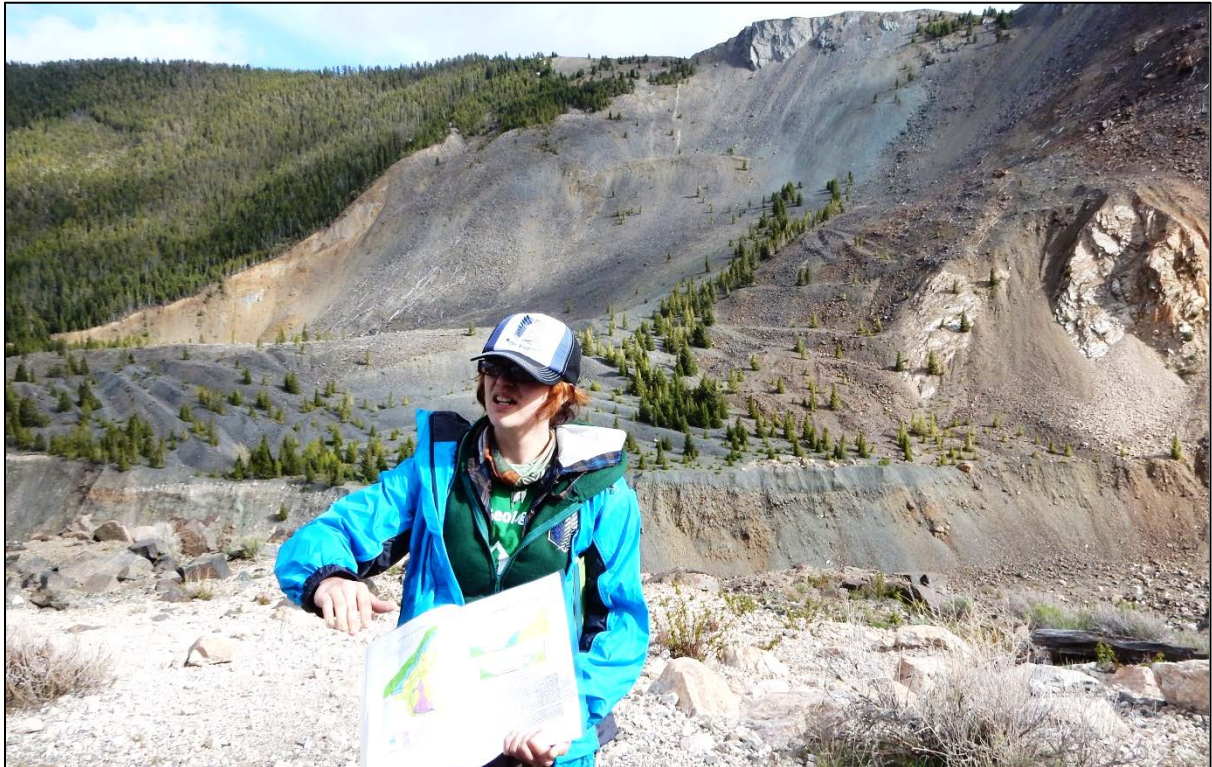
Above: EES group at Old Faithful, Yellowstone N.P. Below: Portal to the underworld at Yellowstone.







Group photo in front of Borah Peak and Lost River Range, Idaho.



Lindsey Belliveau giving her presentation on the Madison Landslide, near Yellowstone.





Jenny, David, Jimmy, Greg, Mike and Michael in Cascade Canyon, Grand Teton National Park



Some friends we made along the way.