

COURSE SYLLABUS

GEO 2500

Active Processes Field Excursion

Fall 2013

Lecture: W 4:00—4:50

GEOL 308

Professor:

Tony Lowry

(Department of Geology)

- Geology Bldg Room 106
- Email: Tony.Lowry@usu.edu
- Office Hours: By appointment

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COURSE DESCRIPTION

Geology 2500 (“Field Excursions”) seeks to introduce you to geologic features and processes as they are observed in the field. By-far the most impressive concentration of unmistakable features relating to active, dynamical processes in the deep Earth can be found just four to five hours drive from Logan, in the vicinity of Hebgen Lake, Yellowstone and Grand Teton National Parks.

Hebgen Lake was the site of the 1959 Hebgen Lake earthquake, one of the largest historical earthquakes in the intermountain west. We’ll see the impressive landslide features and a 3m fault scarp the event left behind. Yellowstone and the Snake River plain to its southwest tell the tale of a plume of hot and/or volatile rich rock welling up from deep in the mantle; landforms, lava flows, earthquakes, geodesy, and chemistry of Yellowstone’s unparalleled geyser and hydrothermal features tell an exciting story of how this saga continues right up to the present day. Along the way we’ll also see impressive landforms associated with Pleistocene lakes and glaciation, discuss earthquake swarms and “breathing” of magma systems, ponder “seiches” observed on Hebgen and Yellowstone lakes, and even talk a little biology!

About the professor:

I am a geophysicist (“Physics of the Earth”) who focuses on measuring and understanding how and why planets deform. On Earth, this relates directly to processes of fault slip, earthquakes and volcanoes, but also has implications for mass transfer in the atmosphere, hydrosphere and cryosphere. I grew up just down the road from the field area, in Jackson Hole Wyoming, and did PhD studies with Robert B. Smith (now retired, but widely recognized as one of the most prolific geoscientists to do research on Yellowstone-related processes). As a grad student I collected field data in Yellowstone and surrounding areas during five summers (1-3 months each).

Course Text

None required. Recommended, if you’re keen: “Windows into the Earth: The Geologic Story of Yellowstone and Grand Teton National Parks”, by R.B. Smith and L.J. Siegel.

Lecture Schedule:

- 28 Aug: Brief Introduction: Logistics and syllabus
- 11 Sep: The geophysical story of Yellowstone
- 18 Sep: Safety, logistics and final planning/prep

Grading:

Will be based entirely on class participation in discussions and activities.

ITINERARY
Geology 2500 — 20–22 September, 2013
Hebgen Lake — Yellowstone/Teton National Parks

20 September:

- Depart Logan 10:30 am

Proceed N on US 91 toward Richmond (49 mi / 1.1 hours)

- Stop 1: Red Rock Pass (30 min)

Merge onto I-15 northbound; continue past Pocatello and Blackfoot (83 mi / 1.2 hours)

- Stop 2: Blackfoot Rest Area (45 min)

North to Idaho Falls, exit US 20/191 toward Rexburg. Continue North past Ashton ~ 2 miles to roadcut (74 mi / 1.1 hours)

- Stop 3: Big Bend Ridge rhyolite flows (30 min)

Continue N on US 20/191 to ID 87 (left, N), then right (E) on US 287 (66 mi / 1.1 hours)

- Stop 4: Quake Lake (45 min)

Continue E on 287 to Cabin Creek Campground (6 mi / 0.2 hours)

- Stop 5: Set up camp.

21 September:

- Stop 1: Hebgen Fault Scarp (at campsite; 30 min)

Travel east on US 287, then right (S) on US 191/287 to West Yellowstone (gas stop). Continue E on US 191/20 to Yellowstone Park. (0.9 hours)

- Stop 2: Just shy of Madison Junction (15 min)

Continue to Madison and turn left (N) toward Norris; continue 1 mi (0.1 hr)

- Stop 3: Terrace Springs

Return S to Madison, continue S and take the one-way Firehole Falls spur

- Stop 4: Firehole Falls

Continue S on one way, and S on the Grand Loop road (0.1 hr)

- Stop 5: Midway Geyser Basin

Continue S (0.1 hr)

- Stop 6: Biscuit Basin

Continue S (0.1 hr)

- Stop 7: Old Faithful

Drive SE to West Thumb; continue left (N) to Fishing Bridge; turn right (E) toward East entrance. Continue ~ 5 mi to Mary's Bay (1.2 hr total)

- Stop 8: Mary's Bay

Return to West Thumb; continue S ~2 mi to Grant Village

- Stop 9: Grant Village (set up camp)

22 September:

Drive N to Fishing Bridge; continue N ~4 mi (0.6 hr)

- Stop 1: LeHardy Rapids

Continue N to Lower Falls overlook (near Canyon Jctn) (0.4 hr)

- Stop 2: The Grand Canyon of the Yellowstone

From Canyon Village, go W to Norris (0.4 hr)

- Stop 3: Norris Geyser Basin

Return to West Thumb and continue S to Teton Natl Park; turn right (just beyond Jackson Lake) on Jenny Lake Loop road

- Stop 4: Jenny Lake

Continue S to Moose; right on US 89 S to Jackson (gas stop). Continue S on US89 all the way to Logan (4.1 hr) with optional rest stops along the way...

Notice to veterans and students with disabilities: Students with ADA-documented physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations. Veterans may also be eligible for services. All accommodations are coordinated through the Disability Resource Center (DRC) in Room 101 of the University Inn, (435) 797-2444 voice, (435) 797-0740 TTY, or toll free at 1-800-259-2966. Please contact the DRC as early in the semester as possible. Alternate format materials (Braille, large print or digital) may be made available with advance notice.