



YELLOWSTONE FOREVER

THE GEOLOGY OF ECOLOGY: CALDERA COMMUNITIES, NORTHERN RANGE NICHES, AND MORE

Itinerary & Details

FIELD SEMINAR - SUMMER 2021

INSTRUCTOR: Paul K. Doss, Ph.D

INSTRUCTOR BIOGRAPHY: PAUL DOSS, Ph.D., makes geology come alive for his students. A former supervisory geologist for Yellowstone National Park, he now teaches in the Department of Geology and Physics at the University of Southern Indiana. For more than three decades, he has taught field geology, conducted research, and completed geologic mapping in the Rocky Mountain Region and the Yellowstone Plateau.

ACTIVITY LEVEL: This course is an activity **level 2** and students enrolled in this course are expected to be active participants. Be prepared to hike up to 3 miles per day, comfortably, with elevation gains up to 600 feet. Some off trail hiking possible.*

**All field activities will be conducted as a group. If you cannot meet the activity level expectations during your program, you may be restricted from participation in daily outings. We will not alter program itineraries or activities to accommodate participants who cannot meet the expectations of the stated activity level.*

LOCATION: Lamar Buffalo Ranch – Yellowstone National Park, WY

PROGRAM DATES & TIMES: The program begins at 7:00 p.m. on Friday, July 9, 2021 and ends on Monday, July 12, 2021 at 5:00 p.m.

LODGING CHECK-IN & CHECK-OUT: Lodging check-in begins at 4:00 p.m. on Friday, July 9, 2021, and lodging check-out is at 9:00 a.m. on Tuesday, July 13, 2021.

MEALS: You will need to bring your own food; lunch should be able to travel in the field with you.

For general information about the facilities, preparing for classes, what to expect, cancellation policies, and more, please see the [Lamar Buffalo Ranch - Summer General Information](#) document.

FROM THE INSTRUCTOR

Welcome to The Geology of Ecology. In this program, we will see the obvious and magnificent ways that geology controls the biological components of Yellowstone's ecosystem. Although every ecosystem on earth is based upon a geological foundation, the controls on biological variations are magnificently displayed in Yellowstone National Park. From large landscapes to individual hot springs, from the "Charismatic Megafauna" to microscopic plants and animals, the interplay among volcanic and hydrothermal processes, rock types, hydrogeology, and the distribution of plants and animals are intricate and remarkable.

Yellowstone National Park is globally unique. Geological forces, in particular those forces linked to Yellowstone volcanism, impart their power over the landscape we see today. This three-day program will permit us to observe large- and small-scale geological processes, and then interpret the impacts of those geological influences on the biological landscapes in Yellowstone. The objectives of the program are to:

- Realize that geology is not just rocks, but that geological materials and processes truly make up the foundation of ecology and landscape history.
- Determine the role of geology on landscape development.
- Observe and interpret how different geological processes and materials generate clear-cut differences in ecosystem development.
- Focus on the unique geology and landscapes of Yellowstone but learn the concepts and types of observations that can be used to interpret landscapes in other localities and regions.

Throughout this program we will see wonderful and very tangible examples of the way geological materials and processes control the development and persistence of ecosystems. Why were wolves re-introduced into the Lamar Valley and not the Central Plateau? Why do grizzly bears migrate seasonally to the Washburn Mountains near the end of summer? How is it that bison can survive year-round on a plateau above 7,000 feet in altitude that gets several feet of snow every year? How are rockfalls and trout related? As much as is possible, all of our time will be spent in the field, with brief introductory lectures, discussions (which are nearly always vibrant!), and short hikes to wonderful observation sites. Our hikes will generally be less than two miles. On some occasions there are steep trail sections, but these are short. There may be extended periods of sun exposure with little options for shade, so please plan accordingly.

I look forward to meeting you in Yellowstone!

- *Paul K. Doss, Ph.D.*

PROGRAM ITINERARY

The itinerary is designed to take advantage of the best opportunities in the park, but may be adjusted to adapt to weather conditions, wildlife activity, holidays, and road construction. *The details and timing of the agenda are subject to change.*

Day 1 **Evening Orientation**

Evening welcome, introductions, and Background information

Day 2 **In the Field**

The Big Picture: Yellowstone's Continental Hotspot Volcanism—the world's largest active volcano

The Big Picture: Landscapes and landforms, The Northern Range

Forest systems: Washburn Mountains

Glaciation in Yellowstone: Lamar Valley, Blacktail, Charismatic Megafauna

Day 3 **In the Field**

The Big Picture: Landscapes and landforms, Gallatin Mountains

Forest systems: Central Plateau (Solfataras)

The Caldera and resurgent Domes

Canyon Area

Valleys and meadows: Hayden Valley, Charismatic Megafauna

Yellowstone Lake, Yellowstone River

Day 4 **In the Field**

The Big Picture: Yellowstone Lake

Thermal Basins: Upper Geyser, Lower Geyser, Norris

Day 5 **Check-Out**

Check out of ranch by 9:00 a.m.

PROGRAM EQUIPMENT

For a full list of recommended equipment for all courses see the [Lamar Buffalo Ranch - Summer General Information](#) document.

Required:

- Notebook and pencil for observations

Optional:

- Magnifying glass or hand lens
- Camera
- Binoculars

RECOMMENDED READING

No prior reading is required, but participants might enjoy the following publications, that complement the program. Most publications are available at Yellowstone Forever's online store at shop.yellowstone.org Yellowstone Forever supporters receive a 15% discount and proceeds directly support the park.

- Christiansen, R.L., 2001. *The Quaternary and Pliocene Yellowstone plateau volcanic field of Wyoming, Idaho, and Montana*. U.S. Geological Survey Prof. Paper 729-G, 143 p.
- J.M. Good and K.L. Pierce. 1996. *Interpreting the Landscape of Grand Teton and Yellowstone National Parks: Recent and Ongoing Geology*. Grand Teton Natural History Association.
- W.J. Fritz and R. Thomas, 2011. *Roadside Geology of the Yellowstone Country*. Mountain Press Publishing Company.
- R. B. Smith and L. J. Siegel. 2000. *Windows into the Earth: The Geologic Story of Yellowstone and Grand Teton National Parks*. Oxford University Press.

WHOM TO CONTACT

For any questions, concerns, or additional information please contact the following:

- Program itinerary, health forms, payment, and activity questions please contact Yellowstone Forever at institute@yellowstone.org or 406-848-2400
- Road updates, park conditions, and general park information please contact Yellowstone National Park Service at <https://www.nps.gov/yell/contacts.htm>
- If running late for a program, please contact 406-848-2400