



**Colorado Plateau- *Desert Canyons and Cultures***

15 semester credits

**Academic Credit**

All courses offered by the Wild Rockies Field Institute are accredited through the University of Montana with administrative support from the School for Extended and Lifelong Learning. Academic oversight of each Wild Rockies Field Institute course comes from University of Montana departmental leadership and faculty. Accepted students have the potential to earn credit in five academic courses (3 credits each):

- Environmental Studies 395- Environment and Culture of the Colorado Plateau
- Environmental Studies 395- Public Land Issues of the Colorado Plateau
- Geography 348- Geography of the Colorado Plateau
- Native American Studies 391- Indians of the American Southwest- Relationships with the Land
- Natural Resources and Science Management 311- Natural History of the Colorado Plateau

**Estimated Course Contact Hours and Academic Work Time**

The time ranges below describe daily student requirements for participation on a WRFI course. These ranges are approximate and vary with assignments, field learning opportunities, and environmental conditions:

- Instructional Contact Hours- 2-4 hours of formal classroom-style work per course day. This includes lectures, discussion-based classes, guest speaker presentations, individual meetings with course instructors or teaching assistants, and academic exercises not involving field exploration.
- Field / Laboratory Contact Hours- 2-4 hours per course day. This includes field explorations and exercises, site visits, local guest speakers, and opportunistic instruction as relevant examples of course concepts and issues arise.
- Individual Academic Work- 2-6 hours per day. This includes completing required readings, individual writing assignments, research investigation associated with course assignments, reviewing peer work.

\* The average amount of Instructional and Field/Laboratory contact time is 5.5 hours per day.

\* Each 3-credit WRFI course is developed with approximately 67 contact hours.

**Dates**

Pre-Field Expedition Remote Study	August 21 – September 11, 2019
Field Expeditions	September 12 – November 12, 2019
Post-Field Expedition Remote Study	November 12 – December 3, 2019

## **Instructors**

Eva Christ- M.A. Environmental Sociology, Ludwig-Maximilian University, Munich

Joe Loviska- M.Ed. Environmental Education, Western Washington University; B.A. English, University of Montana

Ryan Marsh- Ph.D. Environmental Science, Policy and Management, University of California-Berkeley; M.S. Conservation Biology & Sustainable Development, University of Wisconsin-Madison; B.S. Zoology and B.S. Anthropology, Humboldt State University

James Mauch- M.S. Geology, Utah State University (in process); B.S. Earth Science, Montana State University

David Morris- M.S. Environmental Studies, University of Montana; B.A. Environmental Studies, Evergreen State College

Daisy Purdy- Ph.D. Political Science, Northern Arizona University (in process); M.Ed. Secondary Education Social Studies, Northern Arizona University; B.A. Cultural Anthropology, University of New Hampshire

## **Location**

This course takes place in the Colorado Plateau region of the American Southwest, on successive explorations of Horseshoe Canyon, Dirty Devil Canyon, Hopi Reservation, Navajo Reservation, Dark Canyon and the Green River. Throughout the course, students and instructors visit the ancestral homelands to more than a dozen tribes, meet with guest speakers, and tour sites relevant to the course curriculum.

## **Semester Overview**

Through their field experiences with all five academic units on this course, students will gain an academic and experience-based understanding of the issues faced by the cultures and landscapes of the Colorado Plateau. *Resilience and Revolution: Adaptation in a Region on the Edge* is the unifying theme of the course. Following that theme we explore how these paired concepts apply to various biophysical and social systems experiencing disturbance – either by rebounding to a previous state (resilience) or with substantial shifts in structure and function (revolution). The academic disciplines of Native American studies, natural history, public lands policy, cultural history, and regional geography connect our field-based explorations to traditional academic contexts. Explicitly connecting the powerful field experiences gained on expeditions to on-campus study helps students apply their learning to diverse issues and environments. Students leaving this semester will have a base of experience and contextualized academic learning that will facilitate engaged citizenship.

## **Environmental Studies 395- *Environment and Culture of the Colorado Plateau***

### Course Description

Students on this course will explore the concept of environmental sustainability as applied to the societies and environments of the Colorado Plateau. The course explores the essential goals of sustainability (*what* is to be sustained) and the means to that end (*how* to sustain it) through various conceptual frameworks. These include: Native American philosophies and practices, 19<sup>th</sup> and 20<sup>th</sup> century conservation ethics, conservation biology, and bioregionalism. Issues examined in this context include: water policy, mining, grazing, energy production, built environments, and climate change. As an framework for addressing sustainability issues, we will explore the concepts of resilience and systems theory. Patterns seen in environmental, climatic, cultural, economic, and interpersonal systems will provide students with powerful

examples of system and resilience dynamics, and allow them to position themselves more effectively as citizens and actors in social and ecological systems.

### Academic Objectives

Each student will:

1. Understand the concepts and debates around sustainability on the Colorado Plateau.
2. Understanding the concepts of systems theory, disturbance, resilience, thresholds, alternate stable states, and novel systems.
3. Acquire direct experience with sustainability and resilience issues and practices via expeditions, site visits, meetings, and project work.
4. Understand how sustainability and resilience apply to specific social-ecological issues, including: species conservation, river conservation, water policy, energy production and use, farming and ranching, fossil fuel extraction and use, wilderness conservation and climate change.
5. Understand the views and priorities of land managers, agricultural producers, elected officials, conservationists, recreation users, tribes, and regional industries relating to sustainability and resilience.
6. Understand the relationship between the objectives described above and the other concurrently taught courses in natural history, Native American perspectives, public lands management, and regional geography.
7. Develop analytical thinking, discussion, writing, and presentation skills relating to sustainability and resilience.

### **Environmental Studies 395: *Public Land Issues of the Colorado Plateau***

#### Course Description

Students on this course will develop a clear understanding of the major laws that affect land management on the Colorado Plateau and how they have been applied by land management agencies. Many of the basic laws governing public lands in the West were created for the conditions prevalent in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. We will explore the effects these policies have had on the cultures, ecologies, and economies of the Colorado Plateau through readings, class discussions, meetings with a wide variety of public lands officials and community members, written exercises, and independent research. Students will be required to apply their learning to the relationship between public land policy and regional resilience – and to give useful input on these issues to public lands managers in the region.

### Academic Objectives

Each student will:

1. Develop a clear understanding of the major laws that direct land management on the Colorado Plateau—notably the Mining Act of 1872, Taylor Grazing Act, Wilderness Act, FLPMA, NEPA, the ESA, along with water and tribal policy.
2. Explore the historical and social underpinnings of public land laws in national, regional, and local contexts.
3. Develop a clear understanding of current issues relating to public land and resource management in the region and nation.

4. Explore how landscapes, communities, and regional biota respond to a variety of public and private land management regimes on BLM; National Park; Forest Service; tribal, state, and private lands; and navigable waterways.
5. Develop informed personal policy positions on the management of lands and resources on the Colorado Plateau.
6. Understand how land management policy affects our course theme of “resilience and revolution” in social and ecological systems.
7. Integrate learning about regional public lands issues with the geographical, cultural, political, and economic understandings gained on the other academic courses included in the semester.

### **Geography 348: *Geography of the Colorado Plateau***

#### Course Description

This field course examines relationships between humans and the natural environment on the Colorado Plateau. We explore both wild and settled environments to understand the following questions: What are the elements (climate, vegetation, landforms) that characterize landscapes in this region? How and why have successive human cultures modified these landscapes? How have the dynamic environmental conditions here influenced human activities? Given our understanding of the geographical landscape, how have past and present human cultures demonstrated resilience, or experienced revolutions, in their relationship with the Colorado Plateau? Assignments, discussions, and exercises are designed to help each student build a grounded perspective and address these essential geographic issues.

#### Academic Objectives

Each student will:

1. Gain first-hand knowledge of the geographic features of the course area.
2. Examine the interactions between people, landscape and natural resources through experiences, meetings, readings and discussions.
3. Understand the historic and current effects of climate change on the development of landforms, ecological communities, and human cultures on the Colorado Plateau.
4. Explore energy resources found on the Colorado Plateau (oil, natural gas, coal, tar sand, uranium, wind, water); their formation, extraction, use, and implications.
5. Become adept at reading topographic maps, atlases, river maps, and other graphic representations of regional landscapes. Use these media effectively for navigation and analysis of regional natural resource issues.
6. Integrate geographical learning with the natural history, cultural, political, and economic understandings gained on the other academic courses included in the semester.

### **Native American Studies 391:**

#### ***Indians of the American Southwest- Relationships with the Land***

#### Course Description

The course is designed to give students a grounded and contextual understanding of Indian peoples' traditional relationships with the land in the American Southwest and explore how and why those relationships have changed in relation to dynamic climatic, economic, political, and cultural factors. The class will meet with tribal leaders to learn first-hand about the history and

current issues facing regional tribes—with a particular emphasis on tribal sovereignty and self-determination. Readings and discussions will be complimented by homestays on the Navajo and Hopi reservations. As opportunities are available, students may participate in restoration and resource management projects as directed by the tribe, engage with intergenerational community members including elders and young knowledge holders, participate in culturally appropriate traditional dry farming and livestock practices, and participate in social ceremonies as invited by tribal members.

### Academic Objectives

Each student will:

1. Be familiar with the history of the Native peoples in the American Southwest.
2. Understand the outlines of traditional and contemporary tribal relationships with the land in the region of the Colorado Plateau; contemporary home of the Hopi, Navajo, Zuni, Apache, Havasupai, Hualapai, Ute, and Southern Paiute tribal nations.
3. Understand the cultural, social and economic changes that have been imposed on regional tribes as a result of settler colonialism and forced relocation to reservations.
4. Become familiar with the Bureau of Indian Affairs, boarding schools and other institutions that continue to impact tribal-land relationships.
5. Understand how the necessity of adapting to the invading cultures has affected Indigenous relationships with the land.
6. Explore different concepts of tribal sovereignty and self-determination.
7. Understand and apply culturally appropriate Indigenous Knowledge to current regional issues of social and ecological sustainability.

### **Natural Resources & Science Management 311: *Natural History of the Colorado Plateau*** Course Description

This course uses field studies to intensively examine the ecological interactions that make the Colorado Plateau region unique. To foster our students' capacities to carry out in-depth inquiries, field exercises and assignments cultivate observation techniques and habits, critical thinking skills, and a sense of curiosity. Specific in-depth field skills include desert plant identification, songbird and waterfowl identification, track analysis, comparative grazing analysis, and strategies for effectively and systematically documenting field observations. Students will use these skills to elucidate the structure and function of ecosystems at varying scales. They will take an in-depth look at examples of disturbance (intermittent streams, invasive species, grazing, and climate change) and constraints on species movement (temperature envelopes, precipitation envelopes, and geographic barriers). Drawing on systems thinking perspectives, students will discuss the potential for species and ecosystem adaptation while also identifying limitations. From here, students will delve into concepts of alternate-stable states and novel ecosystems. By searching for patterns, sharing observations, and researching accepted theories, students gain a direct understanding of their physical and ecological surroundings. They will also come to understand the role that human communities play in degrading, managing, using, preserving, and restoring Colorado Plateau ecosystems.

## Academic Objectives

Each student will:

1. Develop an experience-based understanding of organismal and landscape responses to biophysical conditions on the Colorado Plateau, supplementing and refining these ideas with material from readings, lectures, and discussion.
2. Identify specimens and understand the life histories of a significant number of plant and animal species ( $\geq 50$ ) found in the field. Connect these life histories to environmental conditions and/or historical changes in environments.
3. Develop a clear understanding of basic ecological concepts and identify local examples of them, including: scales of ecological diversity including species, community, population, and ecosystem; endemic and exotic species; niche partitioning and speciation; species conservation and extinction processes.
4. Relate natural history practice and discoveries on the course to systems theory and the overall course theme of “resilience and revolution.”
5. Integrate natural history observations and concepts with the geographical, cultural, political, and economic understandings gained on the other academic courses included in the semester.

## **Requirements and Evaluation**

All students will receive distinct letter grades for each of the five courses comprising the field semester based upon their participation and performance on the following assignments and activities. Students will be required to complete the following:

- Pre-course Assignments (5%)- Readings, research, and writing assignments completed online in advance of the field start date
- Plant Study (5%)- Present a detailed plant studies to the class based on extensive observations and research in field guides
- Geology Study (5%)- Develop a detailed stratigraphic column with notations depicting texture and topography at varying scales
- Citizen Letter (5%)- Write a letter to a public official (or public forum such as newspaper editorial pages) focusing on a Native lands issue
- Blogs (10%)- Write one to two blog entries regarding course experiences and learning to be posted on the WRFI website
- Participation (10%)- Academic and experiential
- Section Essays/Exams (20%)- Complete examinations at the conclusion of each course section, including conceptual definitions, plant identifications, and essays that summarize learning across course subjects
- Field Journal (20%)- Keep a detailed academic journal during the course and participate in group journal readings
- Final Paper (15%)- Write a final paper that addresses the application of our course theme: *Resilience and Revolution on the Colorado Plateau*. Each academic discipline must be explicitly addressed, and connected to the other course subjects. This paper requires extensive references to personal experiences, speakers, readings, and discussions.

## **Disability Services for Students**

The University of Montana is an equal opportunity education provider and will provide reasonable accommodations for any student taking this course for academic credit. Students with disabilities, who are taking courses through the Wild Rockies Field Institute, may request reasonable accommodations by contacting their field instructors. For questions, concerns, or additional information, students may also contact Roger Maclean, Dean, UM School of Extended and Lifelong Learning: 406-243-2983 or [roger.maclean@umontana.edu](mailto:roger.maclean@umontana.edu).

## **Semester Itinerary**

For the first five weeks of remote coursework students do introductory readings and participate in online discussions in preparation for the field component of the course. These readings introduce regional flora, fauna, geology, and cultural history of the Colorado Plateau, as well as current events and issues. Assignments include writing introductory personal essays, finding relevant articles and readings to share, and writing responses to readings and instructor prompts.

After arriving in Green River, Utah, we begin five weeks of extended backcountry trips in the spectacular area to the west of Canyonlands National Park. We backpack in the remote Horseshoe Canyon and Dirty Devil Canyons, take a road trip through the Four Corners, take another backpack in the Dark Canyon Wilderness, and then canoe the Green River's Labyrinth Canyon maintaining respect for Indigenous peoples.

On the Horseshoe Canyon section we begin our intensive study of the ecological interactions and geological phenomena that make this region unique, and contemplate the lives and livelihoods of the indigenous people who lived here as we observe their rock art and other artifacts. The adventurous Dirty Devil backpack extends those explorations, with a greater emphasis on mining history and fossil fuel extraction, paleontology, and regional land-use history and ancestral Indigenous inscriptions and architecture.

Between these backcountry sections we visit small towns and meet with a variety of local citizens, land managers, scientists, elected officials, farmers, recreationists, traditional knowledge holders – maybe and ranchers. These guest speakers expose students to diverse perspectives on the landscapes and cultures of the area.

Following extended backcountry trips, we spend two weeks in the front-country meeting with more guest speakers representing a wide array of expertise and views. These include restoration ecologists, environmental activists, tribal leaders, traditional knowledge holders, and agency officials. In the past we have done homestays on the Navajo and Hopi Reservations, visited Glen Canyon Dam, toured coal mines and power plants, and met with California condor recovery biologists, among other activities.

After our time on the road, we'll stretch our legs with another backpacking excursion into Dark Canyon Primitive Area and Wilderness. This backpacking trip takes us through the spectrum of regional ecological communities, from montane aspens and pines to recovering deserts on the receding shore of Lake Powell. A rich array of Indigenous ancestral architecture highlights the long human inhabitation of this area, and current land-use issues are evident as we pass through a variety of land management regimes. We finish this section with an ascent of a peak in the Abajo Range, for a literal overview of our explorations on the Colorado Plateau.

To wrap up our adventures, we will take to the waters of Labyrinth Canyon. In canoes we will concentrate on water policy, river ecology, bioregional history, and sense of place.

In addition to the academic topics mentioned above, throughout the course students learn and practice skills in wilderness travel, minimum impact camping, navigation, and plant, animal and geological natural history.

### **Course Readings**

Note that readings are adapted and updated each year to reflect current issues. A course reading list is available upon request.

### **Field Guides (included in traveling library)**

- Alder, P. et al. 1999. *National Audubon Society Field Guide to the Southwestern States*. New York: Alfred A. Knopf.
- Baars, D. L. 1993. *Canyonlands Country*. Salt Lake City: University of Utah Press.
- Chronic, H. 1990. *Roadside Geology of Utah*. Missoula: Mountain Press Publishing Company.
- Barnes, F.A. 1978. *Canyon Country Geology*. Salt Lake City: Wasatch Publishers.
- Bowers, J.E. 1993. *Shrubs and Trees of the Southwest Desert*. Tucson: Western National Parks Association.
- Dunmire, W.W. and G.D. Tierney. *Wild Plants and Native Peoples of the Four Corners*. Santa Fe: Museum of New Mexico Press.
- Elmore, F.H. 1976. *Shrubs and Trees of the Southwest Uplands*. Tucson: Southwest Parks and Monuments Association.
- Ehrlich, P.R., D.S. Dobson, and D. Wheye. 1988. *The Birder's Handbook: A field guide to the natural history of North American birds*. New York: Simon and Schuster, Fireside.
- Fillmore, R. 2000. *The Geology of the Parks, Monuments, and Wildlands of Southern Utah*. Salt Lake City: University of Utah Press.
- Halfpenny, J.C. *Scat and Tracks of the Desert Southwest*. Helena, Montana: Falcon Guides.
- Lowery, J.C. *The Tracker's Field Guide*. Helena, Montana: Falcon Guides.
- MacMahon, J.A. *Deserts*. New York, Alfred A. Knopf.
- McClaran, M.P. and T.R. Van Devender, (Eds.) 1995. *The Desert Grassland*. Tucson: The University of Arizona Press.
- Orndorff, R.L., R.W. Wieder, and D.G. Futey. 2006. *Geology Underfoot in Southern Utah*. Missoula: Mountain Press Publishing Company.
- Sibley, D. A. 2003. *The Sibley Field Guide to Birds of Western North America*. New York: Alfred A. Knopf.
- Sowell, J. 2001. *Desert Ecology*. Salt Lake City: University of Utah Press.
- Tekeila, S. 2003. *Birds of Utah Field Guide*. Cambridge, Minnesota: Adventure Publications, Inc.
- Utah Wilderness Coalition. 1990. *Wilderness at the Edge: Citizen Proposal to Protect Utah's Canyons and Deserts*. Salt Lake City: Utah Wilderness Coalition.
- Williams, D. B. 2013. *A Naturalist's Guide to Canyon Country*. Helena, Montana: Falcon Guides.

### **Speakers**

- Richard Begay– Dine' (Navajo) Tribal Member & USDA Natural Resources Department, Crystal, NM
- Pat Brady – Mayor, Green River, UT
- Kaycee Conger – Blue Castle Holdings (Nuclear Power Plant), Green River, UT
- Gary Cox – National Park Service, Hans Flat Ranger Station, UT
- Dorothy, Susan Denet and Family – Hopi Tribal Member, Farmer, Business owner, Polacca, AZ
- Gayemarie Ekker – Ranch Owner, Wayne County, UT
- Sue Fivecoat – BLM Field Station Manager, Hanksville, UT
- Glen Canyon Dam Interpretive Staff, Page, AZ



Tim Glenn – Museum Director, John Wesley Powell Museum, Green River, UT  
Brett Isaac – Shonto Energy Chief Operating Officer, Shonto, AZ  
Myron Jeffs – BLM Recreation Resource Specialist, Henry Mountain Resource Area, UT  
Regina Layne – Public Relations, Navajo Generating Station, Page, AZ  
Michael Lerma – Professor, author, and musician on indigenous self-determination, Flagstaff, AZ  
Darrell Marks – Former Navajo Nation Tribal Delegate Candidate  
Makaius Marks – Dine’ (Navajo) young knowledge holder, Leupp, AZ  
Makaryn Marks - Dine’ (Navajo) young knowledge holder, Leupp, AZ  
Mike McCandless – Emery County Economic Development Office, Green River, UT  
Andrew Mount – Volunteer Coordinator, Grand Canyon Trust, Flagstaff, AZ  
Randy Ramsley – Mesa Farm and Market, Caineville, UT  
Andrea Sequaptewa – Hopi Community Member, Flagstaff, AZ  
Manny Siyuja – Hualapai tribal member, Peach Springs, AZ  
Mark Sorenson – Principal, Navajo STAR School, Flagstaff, AZ  
Maria Sykes – EpiCenter (rural development nonprofit), Green River, UT  
Tyrone Thompson – Farm Manager, North Leupp Family Farms, Leupp, AZ  
Allen Zufelt – Wildlife Biologist, California condor reintroduction project, AZ

### **Enrollment**

This course will be limited to ten students.

### **Sponsoring Organization**

The Wild Rockies Field Institute (WRFI) is an independent, nonprofit educational organization founded in 1993. Our mission is to broaden the nature of a liberal arts education; teach critical thinking about social and environmental issues; to foster understanding of and respect for natural and human communities; and to cultivate a sense of place that encourages personal, social and environmental responsibility. WRFI courses seek to understand the complex relationships between ecological processes and human actions. To varying degrees within each course, students study local ecology, policies directing public lands management, and ethics that underlie social relationships to the land. Our courses combine traditional classroom teaching methods – including lectures, readings, discussions, papers, and exams – with experiential explorations of the landscapes and communities we visit. We encourage careful observations, critical thinking, thoughtful dialogue, and exploration of diverse perspectives in order to develop the capacity for engaged citizenship in our students.

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