



Worthington Field Studies, Inc.

Thomas Worthington High School
300 West Granville Road
Worthington, Ohio 43085-2501

Contact WFSI at 614-883-2500 ext. 1435 or visit WFSI's website at www.wfsinc.org



Summer Trip 2010 – Course Objectives

Each student enrolled in the Summer Trip 2010 – Pacific Northwest – Field Ecology I course will:

Objectives common to all trip sites:

- Practice and develop interpersonal skills, including teamwork, leadership, and group dynamics, as well as skills in camp cooking, camp etiquette, bus travel, museum visitation, and laundry.
- Maintain a daily personal trip journal incorporating science and history concepts, personal insights regarding the ever-changing physical and ecological environment, participation in group events, responses to specific & general science & history questions, and artwork from all of the day's activities at each site visited.
- Each student will evaluate the purposes of national parks, national monuments, national historic parks, national forests, and other federally-administered land area. This will be achieved through independent research pertaining to a particular park, the development of a presentation to other students, and personal experiences on the trip.
- Describe the concepts, rationales, and procedures for minimal impact group camping, then master these skills.
- Develop group & individual trail hiking skills, including trail orienteering and trail etiquette.
- Overcome a variety of physical and mental challenges, including personal comforts, heat & altitude, prolonged exertion & activity, and heights.
- Participate in the development of a cross-country profile from Worthington, Ohio to Rocky Mountain National Park in Colorado with the collection of elevation, water features, vegetation, and animal data, and then analyze this data.
- Observe changes in weather & climate patterns, such as temperature & precipitation and describe how these patterns determine the plant and animal communities found within each biome & ecotone.
- Describe Native American life & culture, both historical & contemporary by visiting a variety of Native American museums and visitor centers.
- Describe historic patterns of exploration & settlement of the American West, including the role of water, then compare & contrast the daily lives of Native Americans with the early explorers & pioneers.
- Examine a variety of environmental issues, including water rights & usage patterns, global climate change, endangered species and invasion of non-native species.
- Develop an individual environmental ethic based upon ecologically sound & prudent uses & management of our ecosystems & natural resources. Describe their personal beliefs regarding this environmental ethic, as well as how & why it may have changed during this trip.
- Describe the effects of forest, prairie, mountain, desert, and rainforest climates on human physiology, and learn to minimize these effects.

Rocky Mountain National Park:

- Experience the human response to higher altitude & lower humidity.
- Describe the communities of plants & animals associated with each major life zone – montane, subalpine, and alpine tundra, as well as the climatic differences in each life zone, then compare & contrast these with Mount Rainier National Park & Yellowstone National Park.



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- Identify each of the major types of rocks – sedimentary, igneous, and metamorphic, and describe how each plays a part in the rock cycle.
- Observe how the processes of uplift, glaciation, and erosion have shaped the Rockies.
- Observe & define the function of the continental divide.
- Identify a variety of features associated with alpine glaciation.
- Collect data regarding wildfire ecology of the lodgepole pine and compare re-growth values to those found in Yellowstone National Park.
- Describe the effects of global climate change in the Rockies, including the impact of the pine bark beetle.

Antelope Island State Park:

- Identify Great Salt Lake as a terminal lake, and describe the properties associated with terminal lakes, including the ecology & geology of the lake.
- Observe & describe the biology & history of the American bison.

Craters of the Moon National Monument & Preserve:

- Identify features associated with volcanism in the Great Rift Zone – cinder cones, spatter cones, lava tubes, & basalt plateaus, then compare & contrast these features with those found in Mount St. Helens National Volcanic Monument, Mount Rainier National Park, and Yellowstone National Park.
- Compare & contrast the ecology of cinder cones communities & kipukas.

Mount St. Helens National Volcanic Monument:

- Describe the progression of events & disruptions prior to, during, and after the 1980 eruption & observe the ecological recovery of the Gifford Pinchot National Forest & surrounding areas through the Visitor Center, Johnson Ridge Observatory, hiking Hummocks area, and hiking Ape Cave.
- Observe the seismic monitoring station at the Johnson Ridge Observatory.
- Explain the geology & features associated with volcanism of subduction / strato-volcanoes of the Pacific Northwest, then compare & contrast with those found in Craters of the Moon National Monument & Preserve, Mount Rainier National Park, and Yellowstone National Park.

Olympic National Park:

- Describe the climate, geology, and ecology of the unique combination of coastal, forest, and mountain ecosystems found on the Olympic Peninsula.
- Discuss the plate tectonic movements and other geological events that have contributed to the formation of the Olympic Peninsula.
- Observe the climate patterns that result in the ecology of the Hoh rainforest, then identify major plant & animal species of the area.
- Experience ecology of the Ozette coastline & tidal pools, while practicing leave-no-trace backpacking skills along this coastline.



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- Describe the influence of the sun & moon on tidal patterns on the Ozette coastline, observe wave erosion & various coastal landforms, and plan appropriately to backpack around or over headlands.
- Describe the geology of the Puget Sound & San Juan Islands, and observe the ecology of the sound, including orcas and other marine mammals, through a boat trip and visit to the Whale Museum in Friday Harbor.

Mount Rainier National Park:

- Describe the communities of plants & animals associated with each major life zone – lowland forest, Pacific silver fir, subalpine, and alpine tundra, as well as the climatic differences in each life zone, then compare & contrast these with Rocky Mountain National Park & Yellowstone National Park.
- Identify glacial features associated with both valley & cirque glaciation, then describe how global climate change is affecting these glaciers.
- Identify the geological processes that have formed Mount Rainier, and describe the history of its volcanic activities.
- Observe seismic monitoring stations of the Pacific Northwest region associated with volcanic activities of Mount Rainier.
- Describe the geologic & volcanic hazards associated with living near Mount Rainier.
- Identify volcanic features such as lava flows, then compare & contrast these features with those of Craters of the Moon National Monument & Preserve, Mount St. Helens National Volcanic Monument, and Yellowstone National Park.

Yellowstone National Park:

- Identify & explain the geological structure of geothermal & hydrothermal features – geysers, fumaroles, hot & warm springs, paintpots & mudpots. Explain the relationship between plate tectonics, hotspots, and Yellowstone's features.
- Collect data to assess the recovery of the lodgepole pine from the 1988 wildfires & compare it to Rocky Mountain National Park.
- Explain geological features including rock strata associated with the Yellowstone caldera and other volcanic features, then compare & contrast these features to those observed in Craters of the Moon National Monument & Preserve, Mount St. Helens National Volcanic Monument, and Mount Rainier National Park.
- Describe the communities of plants & animals associated with each major life zone – montane, subalpine forests, and alpine tundra, as well as the climatic differences in each life zone, then compare & contrast these with Rocky Mountain National Park & Mount Rainier National Park.

Wind Cave National Park:

- Describe the geological processes of sedimentary deposition, uplift, & erosion that have resulted in the formation of the Black Hills region.
- Describe the ecology of the surface plant & animal communities found within the Black Hills region, as well as life found within Wind Cave.
- Identify the geological processes that resulted in the formation of Wind Cave as well as the cave features, including boxwork, then compare & contrast these features with those of Jewel Cave National Monument.
- Describe the human history associated with Wind Cave's discovery, exploration & use.



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Jewel Cave National Monument:

- Describe the geological processes of sedimentary deposition, uplift, & erosion that have resulted in the formation of the Black Hills region.
- Describe the ecology of the surface plant & animal communities found within the Black Hills region, as well as life found within Jewel Cave.
- Identify the geological processes that resulted in the formation of Wind Cave as well as the cave features, including dogtooth & nailhead spar, then compare & contrast these features with those of Jewel Cave National Monument.
- Describe the human history associated with Wind Cave's discovery, exploration & use.

Mount Rushmore National Memorial:

- Describe the geological processes of sedimentary deposition, uplift, & erosion that have resulted in the formation of the Black Hills region.
- Describe the ecology of the surface plant & animal communities found within the Black Hills region.
- Describe the human history associated with the creation of Mount Rushmore National Memorial, including the contributions made by Gutzon Borglum.
- Summarize the contributions to American society & culture made by each president depicted at Mount Rushmore National Memorial (George Washington, Thomas Jefferson, Abraham Lincoln, & Theodore Roosevelt), and select a hypothetical "fifth president" for inclusion with valid rationale.

Buffalo Gap National Grassland:

- Identify the climatic characteristics of mixed shortgrass & tallgrass prairie communities, and describe the plant & animal communities that compose the ecology of this area.

Badlands National Park:

- Describe the geological events leading to the formation of Badlands National Park area, including deposition of sediments during periods of inland seas, general uplift of the region, & erosion of sediments.
- Identify several rock types found within each of the major strata of Badlands National Park.
- Describe the importance of the fossil record of Badlands National Park, especially important types of mammals.
- Describe the current climatic & ecological conditions with Badlands National Park, and identify plant & animal communities, especially those endangered species recently re-introduced (black-footed ferret & swift fox).