



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 2012 – Course Objectives

Each student enrolled in the Summer Trip 2012 – Central Rockies – Field Ecology 1 course will:

Objectives common to all trip sites:

- Practice and develop interpersonal skills, including teamwork, leadership, and group dynamics, as well as skills in large-group camp cooking, camp etiquette, van 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 areas. 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 discomforts, extreme heat & altitude, prolonged exertion & activity, and heights.
- Participate in the development of a cross-country profile from Worthington, Ohio to Great Sand Dunes 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 of the eastern United States, Central Plains, and Colorado Plateau.
- Experience the human body's response to higher altitude and lower humidity.
- Describe Native American life & culture, both historical & contemporary by visiting a variety of Native American archaeological sites, 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 the 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 / grassland, alpine, and desert climates on human physiology, and learn to minimize these effects.



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Clinton State Park:

- Describe the plants, animals and climate of the ecotone area located between the deciduous forests of the eastern United States and the grasslands of the central plains region.
- Discuss the uses of dams and impoundments in the east in terms of water conservation and recreation opportunities.

Great Sand Dunes National Park:

- Describe the plants, animals, and climate of the high desert biome of the Colorado Plateau.
- Describe the geologic processes that have led to the formation of the dunes as well as the ongoing processes associated with the dunes.
- Discuss the competing geological processes of mountain building, volcanism and plate tectonics versus weathering and erosion in the development of the landscape.
- Recognize and describe relationships of representative plant and animal species of the various alpine life zones (montane, subalpine, and tundra) as learned through direct field experiences of altitudinal succession.
- Describe the effects of climate change on the ecosystems of the high desert and alpine mountains including both managed and natural areas, as well as agricultural areas.

San Isabel National Forest:

- Recognize and describe relationships of representative plant and animal species of the various alpine life zones (montane, subalpine, and tundra) as learned through direct field experiences of altitudinal succession.
- Discuss the competing geological processes of mountain building, volcanism and plate tectonics versus weathering and erosion in the development of the landscape.
- Identify a variety of features associated with alpine glaciation.
- Describe the history of mining in the area and the current economics of mining.

Molas Lake State Park:

- Recognize and describe relationships of representative plant and animal species of the various alpine life zones (montane, subalpine, and tundra) as learned through direct field experiences of altitudinal succession.
- Discuss the competing geological processes of mountain building, volcanism and plate tectonics versus weathering and erosion in the development of the landscape.
- Identify a variety of features associated with alpine glaciation.
- Describe the history of mining in the area and the current economics of mining.

Mesa Verde National Park:

- Compare and contrast patterns of Native American civilizations in Mesa Verde, Grand Teton, and Rocky Mountain National Parks.



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- Describe the effects of climate change on the ecosystems and civilizations of high deserts, mountains and the Great Plains, including both managed and natural areas, as well as agricultural areas.
 - Recognize and describe relationships of representative plant and animal species of the life zones in the area.
 - Discuss the competing geological processes of mountain building, volcanism and plate tectonics versus weathering and erosion in the development of the landscape.
 - Each student will describe the ecology of, succession of, and natural role of fire in ecosystems, as well as the uses and benefits of prescribed burning management techniques.

Arches & Canyonlands National Parks:

- Describe the geologic forces that have led to the development of the Arches region as well as a variety of formations, such as fins, arches, and hoodoos.
- Observe the ecology of and protect cryptobiotic crust and soil formations associated with this feature.
- Discuss the competing geological processes of mountain building, volcanism and plate tectonics versus weathering and erosion in the development of the landscape.
- Utilize their prior knowledge of geologic time and the rock cycle to describe their observations of the stratigraphic layers present in this area.
- Compare the plant & animal species that inhabit the life zones of Arches and Canyonlands with those found at higher elevations we have and will visit.
- Describe the role of the Colorado River in carving the canyons of the Colorado Plateau.

Flaming Gorge National Recreation Area / Ashley National Forest:

- Describe how hydroelectric power is produced through direct observation of the power plant and its operations at Flaming Gorge Dam in Utah.
- Discuss the rationale associated with the multiple use and best use philosophies adopted by the national forests.
- Utilize their prior knowledge of geologic time and the rock cycle to describe their observations of the stratigraphic layers present in this area.

Kemmerer, WY – Warfield Fossil Quarry:

- Describe the processes of fossilization associated with the Green River Formation fossils.
- Utilize their prior knowledge of geologic time and the rock cycle to describe their observations of the stratigraphic layers present in this area.
- Identify each of the major types of rocks – sedimentary, igneous, and metamorphic, and describe how each plays a part in the rock cycle.

Grand Teton National Park:

- Recognize and describe relationships of representative plant and animal species of the various alpine life zones (montane, subalpine, and tundra) as learned through direct field experiences of altitudinal succession.



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- Each student will compare and contrast patterns of Native American civilizations in Mesa Verde, Grand Teton, and Rocky Mountain National Parks.
- Discuss the competing geological processes of mountain building, volcanism and plate tectonics versus weathering and erosion in the development of the landscape.

Medicine Bow National Forest:

- Discuss the competing geological processes of mountain building, volcanism and plate tectonics versus weathering and erosion in the development of the landscape.
- Recognize and describe relationships of representative plant and animal species of the various alpine life zones (montane, subalpine, and tundra) as learned through direct field experiences of altitudinal succession.

Rocky Mountain National Park:

- Recognize and describe relationships of representative plant and animal species of the various alpine life zones (montane, subalpine, and tundra) as learned through direct field experiences of altitudinal succession.
- 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.
- Discuss the competing geological processes of mountain building, volcanism and plate tectonics versus weathering and erosion in the development of the landscape.
- Observe & define the function of the continental divide.
- Identify a variety of features associated with alpine glaciation.
- Each student will compare and contrast patterns of Native American civilizations in Mesa Verde, Grand Teton, and Rocky Mountain National Parks.
- Each student will describe the ecology of, succession of, and natural role of fire in ecosystems, as well as the uses and benefits of prescribed burning management techniques through direct studies of the Lodgepole Pines and other evergreen species.
- Describe the effects of global climate change in the Rockies, including the impact of the pine bark beetle.

High Plains, KS:

- Observe and describe the agricultural and economic practices associated with large-scale beef production in feed lots.
- Describe the representative plant and animal species associated with the high plains of eastern Colorado and western Kansas.
- Describe the causes of the region's climate (aridity) as well as water management techniques utilized here for productive agriculture.

Arrow Rock State Park:

- Describe the human history associated with the Lewis and Clark Expedition as they passed through this area.



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- Compare and contrast the ecology of the Central Missouri region with other locations we've visited, especially the Colorado Plateau, the Central Grasslands, and the eastern deciduous forests.