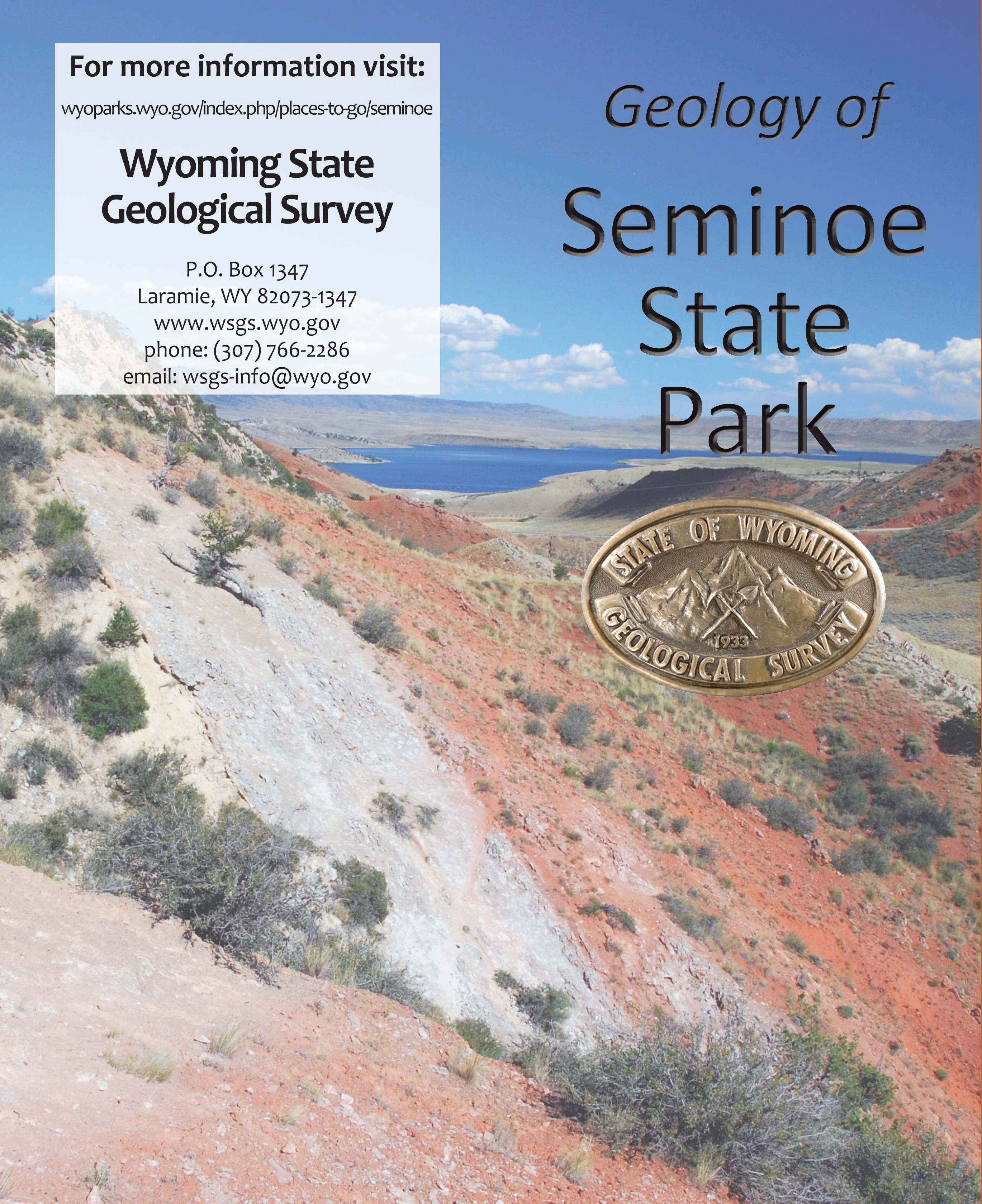

For more information visit:

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Geology of Seminoe State Park

INTRODUCTION

Welcome to Seminoe State Park, home to spectacular views of Wyoming geology. The geology exposed in this area ranges in age from 2.7 billion years old to active sand dunes, and records an exciting history of rock formation, uplift, and faulting.

GEOLOGIC HISTORY

The oldest rocks in Seminoe State Park lie at the north end of the park near Seminoe Dam. These rocks consist of granite and metamorphic rocks as old as 2.7 billion years (Precambrian). These Precambrian rocks make up the core of the Seminoe Mountains and serve as the anchor for Seminoe Dam. Within the park, you may find dense cobbles or boulders with red, yellow and black stripes; this rock is called "banded iron formation." These eroded from the Seminoe Mountains and are part of the Precambrian Seminoe iron-ore deposits explored for mining between 1870 and the 1960s, although no significant iron production occurred.

Around 550 million years ago, these oldest rocks were uplifted from deep in the earth's crust and overlying rocks eroded away. The Cambrian Flathead Sandstone (~540 million years old, or Ma) was deposited in seas and shallow streams on top of the older uplifted rocks, forming a geologic contact that represents a gap in the rock record known as an "unconformity." Approximately 2 billion years of time is missing at this unconformity.

Traveling south from the dam, you pass through increasingly younger rock units, such as the Mississippian- through Pennsylvanian-age Madison, Amsden, and Tensleep formations (~360–310 Ma), which form distinctive, steep ridges of light-colored rocks throughout the area. These rock units originally formed in oceans and vast sand dune fields.

View looking east over Seminoe Reservoir. Red rocks in the foreground are Goose Egg Formation. Light-colored rocks making up the front of the mountains in the distance are Tensleep and Madison formations.

Bright red rocks that make up the North and South Red Hills campgrounds are composed of Permian- and Triassic-age Goose Egg, Chugwater, and Jelm formations (~295–201 Ma). Geologists call these red rocks "red beds," which are layers of sandstone, siltstone, and shale that get their red color from oxidation (or rusting) of iron that naturally occurs in these sedimentary rocks.

Red Goose Egg Formation in contact with white Tensleep Sandstone. The sedimentary layers dip to the south as a result of the Laramide orogeny, a mountain-building event that occurred ~70–35 Ma.

A notable layer within these red beds is the gray-lavender, resistant Alcova Limestone that tops low red ridges near the campgrounds. This distinctive layer is called a "marker bed," which crops out all over Wyoming.

The road to Sunshine Beach lies between two parallel resistant ridges. The Jurassic-age Sundance Formation (~166–157 Ma) forms the northern ridge; it contains dinosaur tracks and marine fossils including oyster shells and belemnites, which are bullet-shaped fossilized bodies of ancient squid-like creatures. The soft siltstone that Sunshine Beach Road sits on is part of the Jurassic-age Morrison Formation (~156–145 Ma), which formed in rivers; the Morrison Formation contains dinosaur fossils at other locations. The southern ridge is the Cretaceous-age Cloverly Formation (~126–100 Ma), which contains a distinctive quartz-pebble conglomerate. The Cloverly Formation was deposited in river and floodplain environments.

South of the ridge of the Cloverly conglomerate are dark-gray shales and occasional tan sandstones of the Cretaceous-age Thermopolis, Mowry, and Frontier formations (~100–88 Ma). These formations were part of a seaway that covered much of North America during Cretaceous time.

All of the rock units listed above were uplifted and faulted into their current positions by the Laramide orogeny, a mountain-building event that occurred ~70–35 Ma. The Cambrian to Cretaceous sedimentary formations were horizontal at the time of their deposition; today the lithified layers are steeply tilted as a result of the faulting that formed the Rocky Mountains as we know them.

Faults offset tan sandstone layers within red shale of the Chugwater Formation.

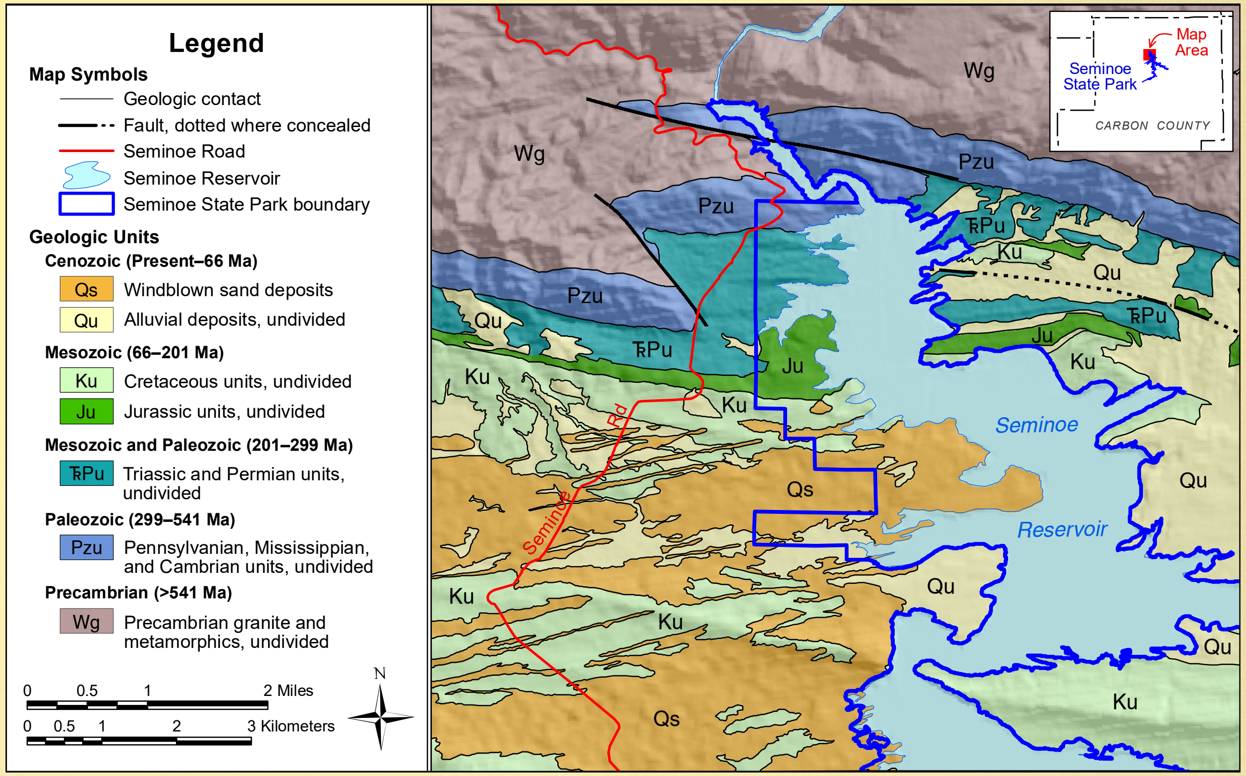
The youngest geologic features in Seminoe State Park are the sand dunes at the southern end of the park. The highest sand dune is actively migrating in the direction of prevailing winds (west to east). Many smaller dunes are stabilized by vegetation, but they show an elongate east-northeast shape, visible on the geologic map, that indicates the common wind direction.

HYDROGEOLOGY

Seminoe Reservoir is designed to hold 1,000,000+ acre-feet (1 acre-foot=326,000 gallons) of water. Most streamflow to the reservoir originates as snowpack in the high-altitude headwater catchments of the nearby Medicine Bow, Sierra Madre, and Shirley mountains. Seminoe Reservoir's largest inflow is the North Platte River, an important tributary to the Missouri-Mississippi River System and a major source of municipal water for the cities of Rawlins, Casper, and Douglas, among numerous others. The reservoir also receives flows from the Medicine Bow River and several smaller streams.

Water flows between Seminoe Reservoir and the surrounding aquifers to form an integrated surface water/groundwater system. Reservoir water infiltrates the rock through porous voids between individual mineral grains and through fractures and faults in the rocks. The hydraulic communication between surface water and groundwater is observed by the similar water levels in the reservoir and area groundwater wells.

However, in some cases, groundwater flows from nearby aquifers into Seminoe Reservoir. Precipitation infiltrates the surrounding exposed geologic formations at higher elevations and flows underground to discharge from springs on land or below the reservoir's water level. Several such springs discharge from the base of the Seminoe Mountains visible to the east. Flows from these springs are highest for a few weeks after snowmelt and then decrease. By mid-summer, flows from these springs may be reduced to a trickle or dry up completely.



Bedrock geologic map of the northwest end of Seminoe State Park. Ages of rocks are in millions of years old (Ma).