

New Interpretive Signs for Medicine Bows/Snowy

By Chamois Andersen, Wyoming State Geological Survey (Fall 2014)

Wyoming's Medicine Bow Mountains abound with geologic features and a landscape that serves as the perfect backdrop for interpretation and road signage. The WSGS plans to create two new signs along the Snowy Range Byway thanks to grant funding received from the Wyoming Office of Travel and Tourism.

One of the signs will depict the geology and geologic history behind the Medicine Bow Mountains, with a billion years difference in the ages of the rock units across the mountain range. The second sign will illustrate the effects of glaciation in the Rockies and how the Snowy Range was formed, along with visuals and text describing the near vertical quartzite rock walls, created from the sand of an ancient sea. This signage project, slated for completion in summer 2015, is in collaboration with the Medicine Bow-Routt National Forest and Brush Creek-Hayden Ranger District.

While traveling in the area, the large expanses of the "Med Bows" offer visitors a great place to see unique geology, as well as evidence of mountain building and the effects of erosion, all in close proximity to each other. These mountains cover more than 2.5 billion years of geologic history in their outcrops, peaks, and ridges. Rock assemblages similar to those exposed in the core of the Medicine Bows exist in only a few places in the world. For more than 1 billion years, sediments, including sand, silt, and carbonates (limestone), at 25,000 feet or more in thickness were deposited in a shallow sea. The sands were converted to quartzites, the silts to phyllites and slates, and the carbonate sediments to marble.

Deformation subsequent to continental suturing along the Cheyenne belt, a little more than 1.7 billion years ago, tilted these rocks into near vertical orientations. Mountain building processes, beginning about 70 million years ago uplifted the mountains. This resulted in thousands of feet of rock being removed by erosion, leaving igneous, sedimentary, and metamorphic rocks exposed at the surface.

The region is filled with hints of its geologic past and events; from ancient volcanic eruptions and lava flows, to the rise and fall of ancient shallow seas and mountain ranges, and finally glaciers that carved the present day valleys and ridgelines.

The high-alpine environment of the Med Bows is a great place to view the effects of glaciation in the Rocky Mountains. During the Pleistocene epoch (1.6 million years to 10,000 years ago) a cool global climate led to the Ice Age, resulting in continental ice sheets and alpine glaciers. The moving ice carved out many of the valleys seen today. Rocks and soil were carried down the valleys by glaciers, and as the glaciers receded (melted) these rocks and soil were left scattered across the surface of the land and piled up in moraines. Large depressions were also carved out by the ice and resulted in the alpine lakes dotting the landscape today. While the glaciers are long gone the year-round snowfields remain along the top of the range.

This ridge, the Snowy Range, is often confused with granite but it is actually made of quartzite, a metamorphic rock. It began as sand, derived from older rocks, and was interpreted by geologist Robert Houston (1993) to have been deposited in a delta nearly 2 billion years ago. Through pressure and heat the sands were changed (metamorphosed) into quartzite. Close inspection of some pieces of the quartzite show ripples that were preserved during the metamorphic process. The Medicine Peak Quartzite is 4,350 to 6,000 feet thick and is very hard. This allows the quartzite to withstand the effects of weathering and erosion, including glacial processes, one of the many reasons why viewing the Snowy Range today is so impressive, offering visitors a great place to interpret the area's geologic past.

For more information, please refer to WSGS Memoir No. 4, "Illustrated geologic history of the Medicine Bow Mountains and adjacent areas, Wyoming," by Samuel H. Knight (1990) and WSGS Memoir No. 5, "Late Archean and Early Proterozoic geology of southeastern Wyoming," by Robert S. Houston (1993).

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