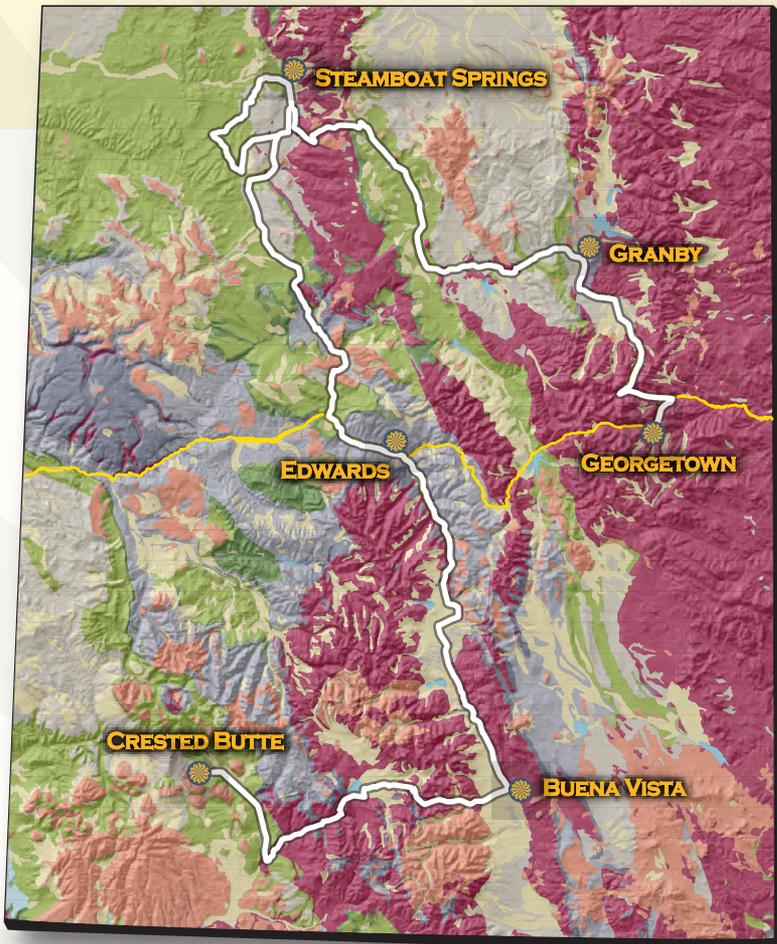


## Geology along Ride The Rockies



### Quaternary—0 to 1.8 million years ago

This is the geologic time period during which the present landscape formed. Glaciation peaked and waned several times, sculpting cirques and U-shaped valleys. Last major glaciers retreated about 12,000 years ago. Includes alluvium (sand, gravel, and silt deposited by rivers and streams), eolian (windblown) deposits, glacial deposits, landslide deposits, and young volcanic rocks (basalt flows).

### Tertiary—1.8 to 66 million years ago

A major mountain-building episode, the Laramide orogeny, occurred during this period—70 to 45 million years ago. Erosion then exposed basement rocks and created a flat surface. Erosion of this surface during regional uplift—beginning 10 to 5 million years ago—shaped the present mountain landscape. Rifting (faulting) began about 30 million years ago, creating the Arkansas and San Luis Valleys.

#### Sedimentary rocks of Tertiary age

Includes sandstone, siltstone, shale, claystone, and conglomerate (rounded rock fragments in a fine-grained matrix).

#### Igneous rocks of Tertiary age

Includes volcanic rocks, such as basalt, rhyolite, and ash-flow tuffs (especially in the San Juan Mountains), and intrusive rocks with compositions similar to granite.



### Cretaceous—66 to 146 million years ago

A seaway flooded Colorado, depositing shallow-marine, shoreline, and swamp sediments. Dinosaurs became extinct by the end of this period. Includes primarily shale, sandstone, and coal, and minor limestone and conglomerate (rounded rock fragments in a fine-grained matrix).



### Jurassic and Triassic—146 to 251 million years ago (includes some rocks as old as 320 million years)

The Ancestral Rockies were eroded during this time of deserts, intermittent streams, salt flats, coastal plains, dunes, and deltas. Dinosaur fossils and footprints are found in deposits of ancient river channels. Includes sandstone, siltstone, and claystone, and minor limestone, gypsum, and conglomerate (rounded rock fragments in a fine-grained matrix).



### Permian and Pennsylvanian—

251 to 318 million years ago

During this time, rocks were uplifted to form the Ancestral Rocky Mountains, which were just as high and rugged as our present mountains. Erosion of older sediments resulted in deposition along mountain flanks and in basins. Includes sandstone, siltstone, shale, conglomerate (rounded rock fragments in a fine-grained matrix), gypsum, and limestone.



### Mississippian to Cambrian—

318 to 542 million years ago

This was a time of widespread marine deposition when Colorado was intermittently below sea level. Represented mostly by limestone, but also includes quartzite, sandstone, shale, and dolomite.



### Precambrian—older than 542 million years ago (includes rocks as old as about 1.8 billion years in Colorado)

The Precambrian accounts for more than 85 percent of geologic time. These rocks are referred to as the basement rocks; they are exposed in the cores of major mountain ranges and in some of the deeper canyons. They are the products of metamorphism (changes in the chemistry and fabric resulting from heat and/or pressure) and igneous intrusion (emplacement of molten rock). Includes intrusive rocks, chiefly granite, and metamorphic rocks, such as gneiss, schist, and quartzite.

 RTR bike route

 I-70

 Lakes



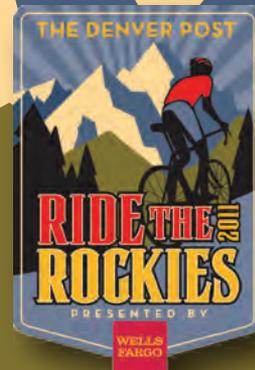
To download this and other USGS materials related to Ride The Rockies, go to <http://www.cr.usgs.gov/rtr/>

# RIDE THE ROCKIES 2011

Crested Butte  
to  
Georgetown

June 12–17, 2011  
412 Miles

Geology  
Highlights



General Information Product 128

U.S. Department of the Interior  
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