Grand Junction is where the Gunnison River joins the Colorado. The majority of the rocks we’ll see today in Colorado National Monument, which lies along the northeastern flank of the Uncompahgre Plateau, are of Mesozoic age (66 to 245 million years old). Desert conditions resulted in the prominent cross-bedded sandstone; multi-hued shale and sandstone formed later in shallow-marine and non-marine settings. These rocks were exposed by erosion after the Uncompahgre Plateau was uplifted during the Laramide orogeny (a mountain-building episode 70 to 45 million years ago).

The flat-topped Grand Mesa is capped by late Tertiary basalt flows (10 million years old) that protect the underlying poorly consolidated, less resistant early Tertiary rocks. The basalt erupted in response to the same crustal extension that shaped the major valleys of the Rio Grande Rift farther to the east.

Volcanic activity is responsible for the hot springs in Ouray and elsewhere in the San Juan Mountains. Heading into the mountains, we move down through the geologic section—from Paleozoic sedimentary rocks to Precambrian crystalline rocks—and then cross into the Tertiary volcanic rocks of the San Juan Mountains, primarily remnants of ash-flow tuff layers that erupted explosively 27 to 30 million years ago from several sources. To the south of Red Mountain Pass catch the view of a classic, glacially U-shaped valley. We re-enter Paleozoic rocks as we head up to Molas Divide out of Silverton; Precambrian crystalline rocks form the mountains to our east.

As we ascend the San Juan River valley out of Pagosa Springs, the road tilts up steeply and our reward is a view of Treasure Falls up Fall Creek to the east. We cross the Continental Divide at Wolf Creek Pass and descend adjacent to South Fork out of the jointed, volcanic tuff layers of the San Juan Mountains. South Fork joins the main stem of the Rio Grande at the town of South Fork where the gradient drops consider-ably as we traverse the San Luis Valley nearly to its center at Alamosa.