USGS
science for a changing world

THE DENVER POST
ridetherockies

Glenwood Springs Loop
2009 Geology Highlights

start

DAY 1
SUNDAY, JUNE 14
80 miles
Glenwood Springs to Hotchkiss

DAY 2
MONDAY, JUNE 15
80 miles
Hotchkiss to Gunnison

DAY 3
TUESDAY, JUNE 16
65 miles
Gunnison to Salida

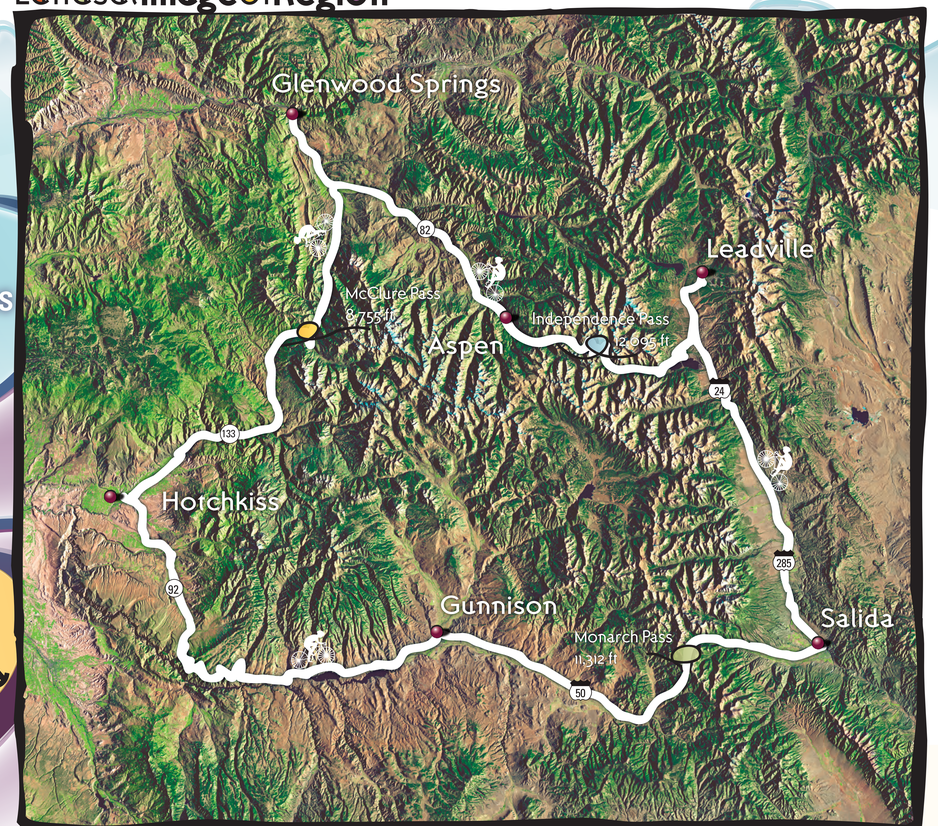
DAY 4
WEDNESDAY, JUNE 17
60 miles
Salida to Leadville

DAY 5
THURSDAY, JUNE 18
55 miles
Leadville to Aspen

DAY 6
FRIDAY, JUNE 19
40 miles
Aspen to Glenwood Springs

finish

Landsat Image of Region



About This Image

Map Scale
0 30 miles

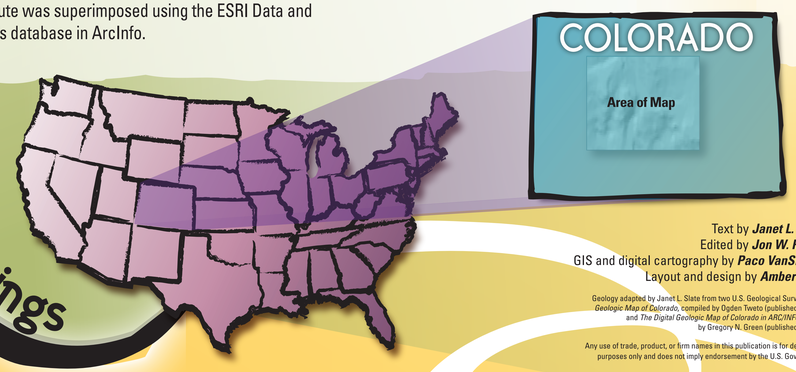
This satellite image is a portion of a mosaic of sixteen Landsat 7 scenes that cover parts of the State of Colorado. The scenes were acquired between October 1999 and October 2000.

Landsat 7 is a medium-resolution, polar-orbiting satellite managed by the United States Geological Survey (USGS). The instrument is an eight-band spectrometer. This image is a false-color composite, which combines bands 5 (SWIR), 4 (near-IR), and 3 (Red) and displays them as red, green, and blue, respectively.

The appearance of shaded relief was created using the National Elevation Dataset, which is based on digital elevation models that have a resolution of 30 meters. The 2009 Ride The Rockies route was superimposed using the ESRI Data and Maps roads database in ArcInfo.

Landsat 7 data are received, processed, and distributed by the USGS EROS Data Center in Sioux Falls, South Dakota. The EROS Data Center is the national archive for land remote sensing data, which includes aerial photography of the United States, elevation data, declassified satellite photography, and Landsat images. Information on the archive holdings may be obtained by contacting the EROS Data Center, Customer Services Department at 1-800-252-4547, email custserv@usgs.gov or browse http://earthexplorer.usgs.gov

The image on this poster may be downloaded for free from the USGS. Go to http://www.cr.usgs.gov/rtr/index.html to link to the download page.



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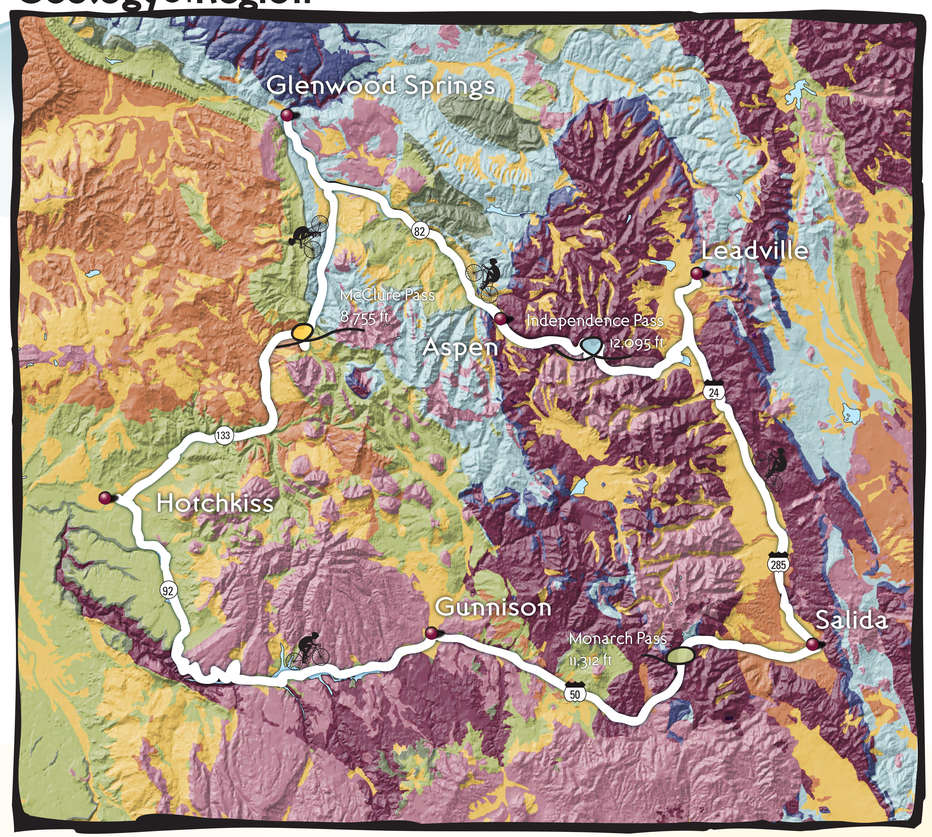
Geology adapted by Janet L. Slate from two U.S. Geological Survey maps: *Geologic Map of Colorado*, compiled by Ogden Tweto (published in 1979), and *The Digital Geologic Map of Colorado in ARC/INFO Format*, by Gregory N. Green (published in 1992).

General Information Product 90
U.S. Department of the Interior
U.S. Geological Survey

Geology of Region



Geology

Map Scale
0 30 miles

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 (semicircular-shaped bowls at the heads of mountain valleys) 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).

Lakes

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.