

Table 1. Geologic time scale with major events in Nevada history.

Million years
before present

CENOZOIC

Quaternary Modern earthquakes, mountain building, volcanism, and geothermal activity are expressions of Basin and Range extension that began in the Tertiary Period. The crust is being pulled apart in Nevada, causing valleys to drop relative to mountains. Prior to 10,000 years ago, ice ages caused glaciers to form in the higher mountains and large lakes to develop, in places connecting today's valleys.

1.6 -----

Tertiary Basin and Range extension began about 30 to 40 million years ago. Igneous activity during the Tertiary Period was caused not only by extension but also by subduction (descent of oceanic crust into the Earth's mantle) of oceanic plates beneath the North American Plate and, in northern Nevada, by motion of the crust over the Yellowstone hot spot in the mantle. Numerous Nevada ore deposits, including most major gold and silver deposits and the copper ores near Battle Mountain, formed during this time. Gypsum deposits formed from evaporating lakes in southern Nevada.

65 *****

MESOZOIC

Cretaceous The Cretaceous Period and Mesozoic Era ended abruptly with the extinction of dinosaurs and many marine species; chemical, mineralogical, and other geological evidence suggests that these extinctions were caused by a large meteorite striking the Earth. Numerous granitic igneous intrusions, scattered throughout Nevada, originated from subduction along the west coast of North America. Much of the granite in the Sierra Nevada formed at this time. The igneous activity caused many metallic mineral deposits to form, including the copper-gold-silver-lead-zinc ores at Ruth, near Ely in White Pine County, copper-molybdenum ores north of Tonopah in Nye County, and tungsten ores in several mining districts. In southern and eastern Nevada, sheets of rocks were folded and thrust from the west to the east during the Sevier Orogeny (mountain building), which began in Middle Jurassic time and ended at or beyond the end of the Cretaceous Period.

144 -----

Jurassic A subduction zone to the west caused igneous intrusions, volcanism, and associated ore deposits, including copper deposits near Yerington. Sandstones, including those in the Valley of Fire, were deposited in southeastern Nevada, and sedimentary gypsum deposits formed in northwestern Nevada.

208 -----

Triassic The general geography of Nevada during the Triassic Period was similar to that during the Jurassic Period—igneous activity in the west and deposition of sedimentary rocks in continental to shallow marine environments to the east. Explosive volcanism produced thick ash-flow tuffs in west-central Nevada. Economically important limestone, gypsum, and silica-sand deposits formed in southern Nevada. The Sonoma Orogeny, which began during Late Permian time and ended in Early Triassic time, moved rocks from the west to the east along the Golconda Thrust in central Nevada. The large marine reptiles at Berlin-Ichthyosaur State Park lived during the Triassic Period.

245 *****

PALEOZOIC

Permian Volcanism to the west and deposition of thick limestones to the east were characteristics of much of the Paleozoic Era in the Great Basin. Some marine gypsum deposits formed in southern Nevada.

286 -----

Pennsylvanian The Antler highland, formed earlier, was eroded and shed sediments into the basins to the east. Carbonate rocks were deposited in eastern and southern Nevada.

320 -----

Mississippian During the Antler Orogeny, from Late Devonian to Early Mississippian time, rocks were folded and thrust from the west to the east. The Roberts Mountains Thrust, below which many of the gold deposits in north-central Nevada occur, formed at this time. Conglomerate, sandstone, siltstone, and shale were deposited in the thick basin of sediments derived from the Antler highland, and carbonate rocks were deposited further east.

360 -----

Devonian Limestone was deposited in eastern Nevada, and shale, chert, and economically important barite were deposited in northeastern and central parts of the state. No record of middle to lower Paleozoic rocks exists in the western part of the state. The quiet, shallow-marine tectonic setting that persisted earlier in the Paleozoic Era began to change, as small land masses from the Pacific Ocean collided with western North America.

408 -----

Silurian Carbonate rocks (dolomite and limestone) in the eastern part of the state and silica-rich rocks (shale, sandstone, and chert) in the central part of the state record similar deposition to that during the rest of the middle to lower Paleozoic Era.

438 -----

Ordovician Marine deposition during the Ordovician Period was similar to that during the rest of the early Paleozoic Era, with the exception of basalts (metamorphosed to greenstones) locally interbedded with sedimentary rocks found today in the central part of the state. Some sedimentary barite deposits and copper-zinc-silver ores formed in sea-floor sediments during this time.

505 -----

Cambrian Middle and Upper Cambrian deposition resembled that during much of the Paleozoic Era, with carbonate rocks to the east and shale plus sandstone to the west. Lower Cambrian and uppermost Precambrian rocks are characterized by quartzite and metamorphosed siltstone throughout much of Nevada.

570 *****

PRECAMBRIAN

The oldest rocks in Nevada (at least 2,520 million years old in the East Humboldt Range in northeastern Nevada and at least 1,740 million years old in southern Nevada) are metamorphic rocks (including gneiss, schist, marble, and metamorphosed granite, pyroxenite, hornblende, and pegmatite). Precambrian rocks also include granites (about 1,450 million years old) and younger sedimentary rocks. Beginning approximately 1,100 million years ago, Antarctica and Australia may have rifted away from western North America, setting the stage for the development of a western continental margin that is similar to the Atlantic coast of today. A shallow marine, tectonically quiet setting persisted in eastern Nevada for the next 700 million years.