

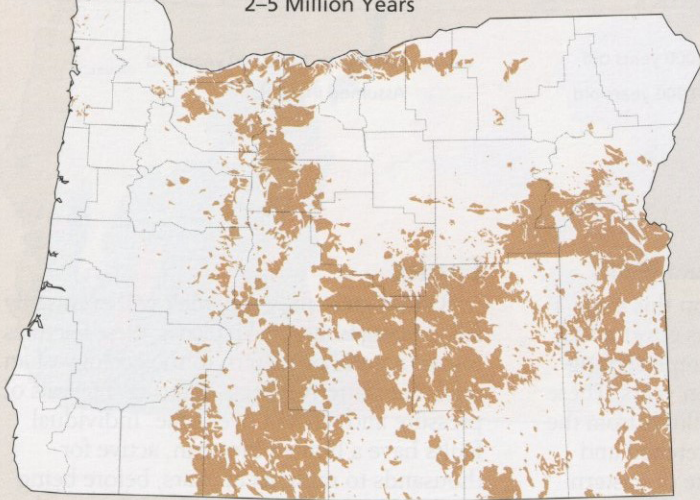
Geologic Ages

Some of Oregon's surface rocks are hundreds of millions of years old, others are only a few thousand years old. Some rocks came to Oregon from distant parts of the globe, others arrived in liquid form as massive lava flows welling up from within the earth. The oldest rocks in Oregon are from the Paleozoic era and the Triassic and Jurassic periods, but, like so many things in Oregon, these rocks are not natives. Pieces of exotic terranes dating from these periods and originating at distant parts of the globe were annexed to North America during the Cretaceous period. Geologists made strides toward understanding the movement of such crustal plates in the early twentieth century, but plate tectonics, as the field is known, has become a mature science only in the past 20 years. As the field has developed, scientists have come to understand how a series of separate crustal plates, moving at extremely slow speeds over millions of years, collided with, were forced under and, to varying degrees, fused onto the huge North American Plate. After this process was complete, these early terranes were largely covered by later rock formations, much as a rising tide inundates progressively more beach rocks. Only small areas of Oregon's most ancient rocks remain visible today. These areas are almost exclusively in the Klamath and Blue Mountains. Scientists have discovered the age and exotic origin of the rocks by examining the fossils embedded in sediments. In the central portion of the state, fossil-bearing marine sediments from the Cretaceous period bear witness to the last time ocean waters covered the areas east of the Cascades. In the Klamath and Blue Mountains,

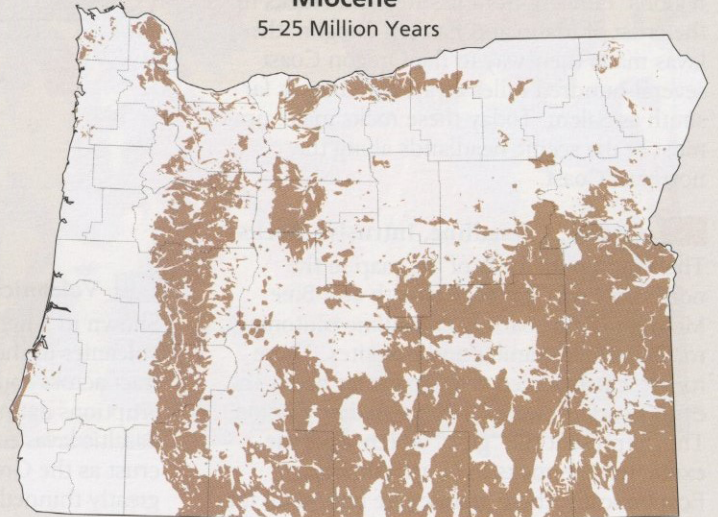
Cretaceous rocks are primarily crystalline (granite-related), and mark the joining of older terranes firmly to the North American continent.

Rocks from the Paleocene, Eocene and Oligocene epochs in Western Oregon are marine volcanic platforms draped with fossil-bearing sediments. Lava flows in the Western Cascades mark the earliest instances of volcanism there. Until late Oligocene time Oregon had a broad coastal plain that extended all the way to what is now the eastern margin of the Willamette Valley. During the Miocene, that coastal plain was elevated as the Coast Range—Oregon began to assume much of its modern complex. Volcanic rocks of Miocene age in the Cascades, as well as across the southeast part of Oregon, represent the greatest outpourings of lava the state has ever seen. Intermixed with these flows are sedimentary basins bearing fossils that nicely chronicle the local environments and climate of that period. At the extreme western margin of the state, Miocene marine (oceanic) rocks and volcanics formed very near the present-day shorelines. Pleistocene (Ice Age) deposits of volcanic origin appear mostly in the central part of the state along its axis at the High Cascades. In the Willamette Valley as well as in southeast Oregon, rocks laid down during a time of vast inland waterways and wetlands preserve a splendid record of Oregon's Ice Age plants and animals. Holocene volcanic deposits are densely concentrated in the High Cascades—other parts of the state feature evenly distributed stream and lake deposits from this period.

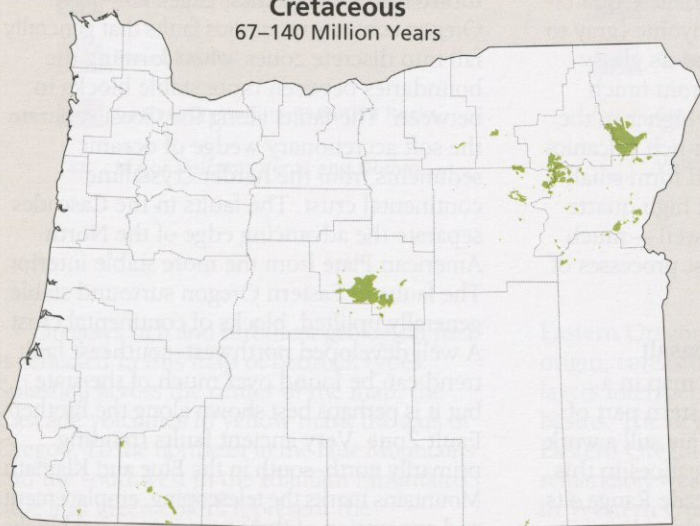
Pliocene
2-5 Million Years



Miocene
5-25 Million Years



Cretaceous
67-140 Million Years



Jurassic
140-200 Million Years

