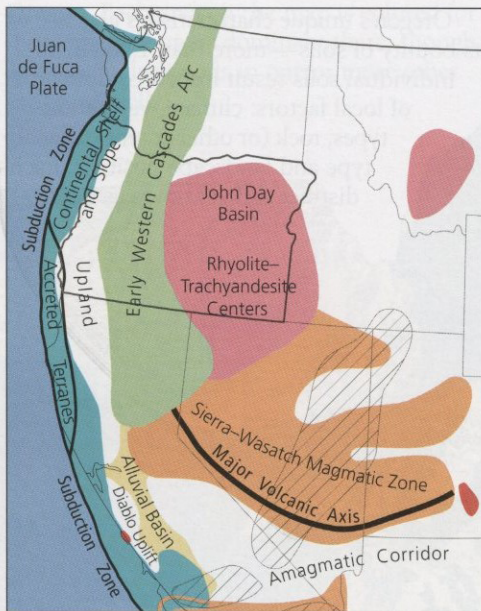


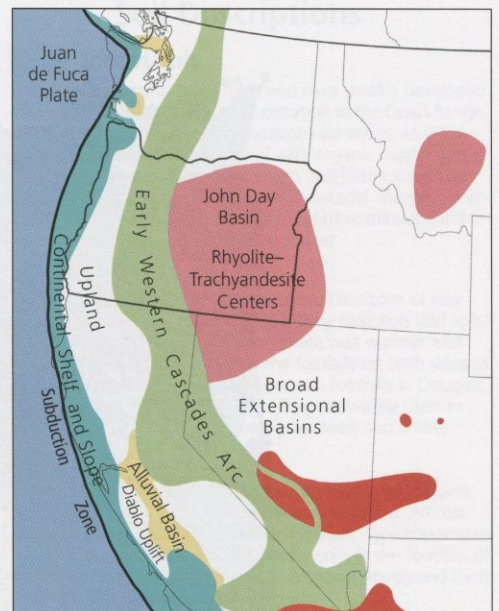
37–28 Million Years Ago

During the Oligocene epoch—starting 37 million years ago—the Clarno volcanics in Central and Eastern Oregon were succeeded by the lighter-colored John Day volcanic rocks and associated non-marine, brightly colored sediments now found at John Day Fossil Beds National Monument. Some of the John Day lava flows in the Deschutes Basin came from volcanoes now buried by the younger volcanoes of the High Cascades Arc.



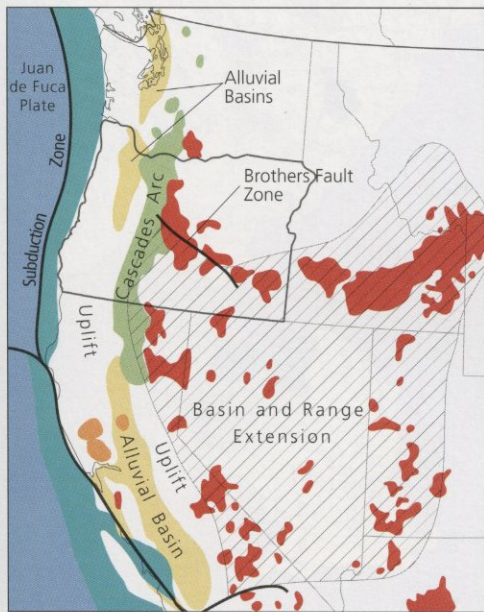
28–21 Million Years Ago

Both the John Day volcanics and the Early Western Cascades Arc continued to accumulate in Eastern Oregon. This arc was bordered on the west by a coastal plain. Shoreline deposits accumulated close to the present Oregon Coast; farther west, sedimentary rocks of this age were deposited in deep water. The subduction zone may have been closer to shore during this period than it is today.



21–17 Million Years Ago

Geologic activity during this time period was similar to that of the preceding period, with volcanics and non-marine deposits in Eastern Oregon, volcanics of the Cascades Arc, a coastal plain and a subduction zone probably east of the present one.



5 Million Years Ago to Present

The present situation is marked by subduction of the oceanic Juan de Fuca Plate beneath Western Oregon, accompanied by eruption of lavas to form the modern volcanoes of the High Cascades Arc. Oregon is at great risk from earthquakes on this subduction zone with potential magnitudes as large as 9 on the Moment Magnitude Scale. The most recent great earthquake (estimated magnitude 9) struck January 26, 1700. Earthquakes also occur in the crust of Western Oregon as well as deep down in the Juan de Fuca Plate. The most recent earthquake in the downgoing slab was the Nisqually Earthquake of February 28, 2001, causing major damage to Olympia and Seattle. Volcanoes also pose a hazard—recently demonstrated by Mount St. Helens. Basin and Range extension continues across southeastern Oregon from Klamath Falls and Summer Lake to Steens Mountain, raised on a great active fault at the edge of the Alvord Desert.

Structural/Physiographic Provinces

