

45°N latitude, based on gravity and seismic refraction measurements and well data, suggests major east-dipping normal faults occur beneath the Western Cascades. A major fault system, oriented approximately north-south, that extends from south of Mt. Hood to south of Mt. Jefferson, juxtaposes Quaternary volcanics of the High Cascades with Tertiary volcanics of the Western Cascades.

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Gravity Anomalies and Structure of the Cascade Range in Northern Oregon

Gravity measurements made in the Northern Cascade Range of Oregon between 44°15' and 45°45'N latitude and 121° and 122°40'W longitude, when reduced to complete Bouguer anomalies exhibit an east-southeast dipping regional gradient that is attributed to a thickening of the earth's crust beneath and east of the Cascade Range. An approximately 15 km wide Bouguer gravity anomaly low extends from the Western Cascades to the Deschutes River across the Cascade Range near 45°15'N latitude and marks a discontinuity in the general north-south trend of the Cascade Range. Elongate gravity anomalies, which trend north-south, are offset approximately 7 km in a right-lateral sense 5 km north of Mt. Jefferson. The offset of the anomalies is interpreted to be caused by right-lateral strike-slip faults in the crust beneath the Quaternary volcanics of the High Cascade Mountains. The postulated faults may be part of a right-lateral, *en echelon* fault system that extends from the Brothers fault zone to the Portland Hills fault.

A model crustal cross section of the Cascade Range near