

## **A Geological Study About Denali And Its Features**

Saranya Devi. R

---

Date of Submission: 07-02-2026

Date of Acceptance: 17-02-2026

---

Denali is a granitic pluton, mostly pink quartz monzonite, lifted by tectonic pressure from the subduction of the Pacific Plate beneath the North American Plate; At the same time, the sedimentary material above and around the mountain was stripped away by erosion. The forces that lifted Denali also caused many deep earthquakes in Alaska and the Aleutian Islands. The Pacific Plate is seismically active beneath Denali, a tectonic region that is known as the "McKinley cluster".

High topography of Denali relates to the complex structural relationships created by the right-lateral Denali Fault and Denali Fault Bend. The Denali Fault is caused by stresses created by the low-angle subduction of the Yakutat microplate underneath Alaska. The Denali Fault Bend is characterized as a gentle restraining bend. The Denali Fault Bend represents a curvature in the Denali Fault that is approximately 75 km long. This curvature creates what is known as a "space problem". As the right-lateral movement along the Denali Fault continues, high compressional forces created at the fault bend essentially push the crust up in a vertical fashion. The longer the crust stays within the restraining bend, the higher the topography will be. Several active normal faults north of the restraining bend have recently been mapped with slip rates of approximately 2–6 mm/year. These normal faults help to accommodate the unusual curvature of the restraining bend.

Denali has a summit elevation of 20,310 feet (6,190 m) above sea level, making it the highest peak in North America and the northernmost mountain above 19,685 feet (6,000 m) elevation in the world. Measured from base to peak at some 18,000 ft (5,500 m), it is among the largest mountains situated entirely above sea level. Denali rises from a sloping plain with elevations from 1,000 to 3,000 ft (300 to 910 m), for a base-to-peak height of 17,000 to 19,000 ft (5,000 to 6,000 m). By comparison, Mount Everest rises from the Tibetan Plateau at a much higher base elevation. Base elevations for Everest range from 13,800 ft (4,200 m) on the south side to 17,100 ft (5,200 m) on the Tibetan Plateau, for a base-to-peak height in the range of 12,000 to 15,300 ft (3,700 to 4,700 m). Denali's base-to-peak height is little more than half the 33,500 ft (10,200 m) of the volcano Mauna Kea, which lies mostly under water.

Denali has two significant summits: the South Summit is the higher one, while the North Summit has an elevation of 19,470 ft (5,934 m) and a prominence of approximately 1,270 ft (387 m). The North Summit is sometimes counted as a separate peak (see e.g., fourteener) and sometimes not; it is rarely climbed, except by those doing routes on the north side of the massif.

Five large glaciers flow off the slopes of the mountain. The Peters Glacier lies on the northwest side of the massif, while the Muldrow Glacier falls from its northeast slopes. Just to the east of the Muldrow, and abutting the eastern side of the massif, is the Traleika Glacier. The Ruth Glacier lies to the southeast of the mountain, and the Kahiltna Glacier leads up to the southwest side of the mountain. With a length of 44 mi (71 km), the Kahiltna Glacier is the longest glacier in the Alaska Range.