Kasey Hinton

Annotated Bibliography

Capps, D., McLane, S., & Chang, L. (2016). Denali Geology Road Guide, pp. 71 - National Park Service. Retrieved from https://www.nps.gov/dena/learn/nature/upload/Denali-Geology-Road-Guide.pdf

Wonder Lake is nearly 300 feet deep and approximately two and a half miles long. This is the seventh largest lake in the park. The formation of this beautiful lake came from the Muldrow Glacier. About 22,000 years ago this glacier covered the whole area and formed the moraine that dams the lake. The glacier dissipated nearly 14,000 years ago. Without recessional moraines to the south that create a dam, this lake wouldn’t be possible. On the north end of the lake, there are the inlets and outlets that feed the lake. This lake is not the only feature in Denali National Park that is formed from Glaciers. Ice is constantly converging and carving out new and interesting features. 15% of all of Denali, that’s nearly 6 million acres, is covered in Glaciers. Unfortunately, it seems as though these Glaciers are retreating rapidly. There is evidence showing that over the last sixty years Denali has experienced a glacial retreat of about 8%. Visiting Wonder Lake puts you at an astoundingly 26 miles away from the summit of Denali. On clear days you can get incredible views of Denali from Wonder Lake.

Enslin, R. (2014, November 19). Geologists Shed Light on Formation of Alaska Range. Retrieved from https://phys.org/news/2014-11-geologists-formation-alaska-range.html

Enslin discusses the efforts of scientists studying earthquakes in an attempt to gain further details about the formation of the Alaska Range. The Denali Fault is responsible for massive earthquakes. This fault is classified as a strike-slip fault. Alaska itself in its entirety is comprised of terranes that have been accreted from the collisions occurring at the North American and Pacific Plate Boundaries. Denali is mainly located in the inward curve of the Denali Fault. The highest spots are actually just north of the fault which is puzzling to geologists because it is having a higher topography outside of the curve is not an expected pattern. Geologists use methods such as acquiring geophysical data and using mapped surface geology to try and figure out a closer time estimate to when the uplift of the range began. They estimate that the uplift began about 25 million years ago.

The Alaska Range and Denali: Geology and Orogeny (U.S. National Park Service). (n.d.). Retrieved from https://www.nps.gov/articles/denali.htm

The National Park Service describes Denali as the “Land of Eternal Winter.” Denali has weather that is capable of changing from sunny to snowstorms with fierce winds in an instant. Plate tectonics are directly responsible for Denali’s insane height. At 20,310 it is the tallest mountain in North America. The Pacific Plate is subducting and with it carrying terranes northward adding more crust. The Hines Creek Fault and Denali Fault are pushing Denali higher every single year. Without the granitic composition of the rocks at Denali, they would have eroded a long time ago. With granite being resistant to erosion Denali is able to keep its momentum and uplift going. The main force of erosion present today is glacial erosion. This article coin’s Denali as “A Land Sculpted By Ice.” Glaciers carry rocks with them as they flow and sometimes leave behind large erratics.

Ridgway, K. D., & Flesch, L. M. (2007, November 01). Cenozoic tectonic processes along the southern Alaska convergent margin. Retrieved from https://pubs.geoscienceworld.org/gsa/geology/article/35/11/1055/129721/cenozoic-tectonic-processes-along-the-southern

This Journal compares the most accepted model for the development of southern Alaska referred to as “terrane tectonics” as well as a newer less accepted model known as the “extrusion” model. In terrane tectonics crust is passively transported with the subducting oceanic plate. As this terrane collides in the subduction zone some of the pieces become accreted to the continental plate. After being accreted these terranes are then tectonically transported to the north by strike-slip faults. This whole conceptually model is used in other places on Earth but was developed in southern Alaska. The contrasting “extrusion” model theorizes strike-slip faults are not the main force of transportation for these terranes. It proposes that the terranes do not collide with the continental margin but are moved north by crustal flow along the margin. After being transported the terrane is then extruded into the Aleutian subduction zone.

Wolfe, J. A., Wahrhaftig, C., Leopold, E. B., & Lanphere, M. A. (1969). The Coal-Bearing Group in the Nenana Coal Field, Alaska. Retrieved from http://dggs.alaska.gov/webpubs/usgs/b/text/b1274d.pdf

The Healy Creek Formation was deposited by in a low-energy depositional environment. There is evidence suggesting that the Healy Creek Formation and it’s other formations (Sanctuary, Suntrana, Lignite Creek, and Grubstake) that make up the Nenana Coal Field were deposited before the Alaskan Range ever existed, as it exists today. Healy Creek was deposited between the upper Oligocene and lower Miocene. The deposition of Healy Creek was peculiar in that it was deposited on an irregular surface. There is much variation in thickness over short distances due to this. As part of the coal-bearing group, with Suntrana and Sanctuary, this formation is widely distributed across a far distance containing coal-bearing rocks in these various patches. Other rock types in addition to coal include sandstone, conglomerate, and claystone.