

How alaska was made

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Introduction Alaska with its unique geologic history is famous for its various forces: earthquakes and volcanoes, mountains and glaciers, all of the, represent this region as the one with dynamic and complex geologic composition. The formation of this land within the context of geologic time began 4.5 billion years ago (Alaska Denali). Alaska has been divided by geologists into two parts with different origin: Accreted and North American Alaska although in some parts those boundaries still remain controversial. The North American Alaska also consists of the parts that were formed in North America though the geologists admit that those territories may be a little bit displaced from their original locations due to the movements of the North America Continental Plate and the Pacific Plate.

Because of their push and slide against each other, Alaska's was pushed northward. Various geologic processes created the regional terrains, and gradually pieced together during the last 220 million years (Alaska Denali). It is very hard to understand Alaska's complex geology and geologists are still working on defining the entire sequence of events that created Alaska.

Because some Alaska rocks are more than two billion years old, the researchers are not even sure if these they came North America. For this reason, the entire sequence of geologic events of Alaska cannot be documented. There were many studies conducted to explore one billion years old rocks that were formed in North America of those times, thus, the researchers, using paleomagnetic signatures, found out that the Alaska Peninsula and its southwestern regions were formed further south from their current location.

It already became clear that the Wrangell Mountains and the Alaska Peninsula were formed in equatorial regions. Plate Tectonics It is well-known fact that the earth's crust is made up of about dozen large fragments, which are called ' plates' that are more than 40 miles thick being more than a thousand miles across. They move slowly and steadily at the rate up to 4 inches per year (Alaska Denali). Compared to the oceanic plates, the Continental are less dense and more buoyant. The researchers define three ways which denote movements of the plates relatively to one another.

The first is the movement of plates towards each other when one is diving underneath the other. That process is called subduction. Aleutian Islands and southern Alaska are perfect example of this situation. In this case Pacific plate dives beneath the North American. The second movement is about sliding of the plates by each other.

Based on this geologic process, southeastern Alaska was formed. And the third movement is when those plates move away from each other. This process is called a spreading zone, which mostly occurs in the water of deep oceans. Folding, thickening and faulting of ocks are the result of the collision of tectonic plates when are pushed upwards and form mountains. The presence of mountains can be a good evidence of such plate collisions. What is interesting, various seismic activities within mountain ranges are good indicators of such ongoing collisions.

Sometimes the mountains may be built as part of a subducting oceanic plate. Earthquakes Earthquakes usually occur either due to subduction of plates or when two plates are sliding by each other. Those huge plates move

at a steady rate creating sometimes neither smooth nor constant motion. When they get stuck and are not slipping by one another, they become 'locked' together. After locked section breaks those two plates, they start sliding past each other, which provokes an earthquake.

Alaska has been the most active area in the United States with the Aleutian Island chain to be seismically the most popular. It is proved that the earthquakes in those areas may extend into the Gulf of Alaska and north to Mt. McKinley (Alaska Denali). The three of the biggest worldwide earthquakes Alaska experienced make eleven percent of the world's earthquakes. For example, the earthquake of 1964, called Good Friday, was the largest recorded one in North America occurred in Alaska, which was rated about 8.5 on the Richter scale.

Some people even compare its energy with that of Hiroshima-size atomic bombs (Alaska Denali). The earthquake usually provokes changes in the soil structure: as a result of the vibrations, the liquefaction of soil can be observed. Such process causes landslides, and during the earthquake many of those occurred around Anchorage area. Besides Alaska is a top 10 of world' earthquakes, it also has more than 10% of the identified volcanoes compared to the whole world. The most active area of volcanic activities is Mount Spurr, Anchorage, Buldir Island and Aleutians.

Alaska's volcanic belt contains about 80 major volcanoes centers that have erupted geologically recently. For example, since 1700, about 40 volcanoes have been recorded at those areas. The most active volcano of the Alaska Peninsula is Pavlov Volcano, which has erupted about 40 times since 1790

(Alaska Denali). The scientists nowadays are very concerned about volcanoes. They are afraid that eruptions can affect the region named Cook Inlet.

This is the area where more than half of Alaska's population lives. Waters
The glacial ice in Alaska dominates its landscape; it constitutes about three-quarters of its all fresh water. In order for glacier to be created, a lot of snow is needed in the mountain. The ice, at the same time, must be flowing downhill. Such effects of glaciation are not observed in the north of Alaska as it is connected with colder temperatures and dry air compared to the coast with the heaviest snowfalls.

The highest concentration of glaciers can be found in the St. Elias and the Chugach Mountains. The largest Alaska's glacier is considered to be the Bering Glacier complex. There are various types of glaciers that can be found in Alaska. The most common one is Valley Glacier, the one that occupies a valley, for example, Exit Glacier and the Muldrow Glacier.

Cirque glaciers are to be found in circular basins and, in Alaska, they are comparatively small. Hanging Glacier is basically abrupt ends of the latter two types of glaciers. The most popular are glaciers in Portage valley. Tidewater Glacier is called the one when a valley glacier flows into the ocean, for example, Holgate and Columbia Glacier. The other glaciers that can be found in Alaska Region are called Piedmont Glacier, Icefield, Ice Cap, Ice Sheet (or Continental Glacier), Glacial Features, Moraine, Lateral moraines, Medial moraines, Crevasses, Blue Ice, Calving, Glacier flour,

Glacier scouring, End moraine, Surging Glaciers, Iceworms and many others (Alaska Denali).

They are all very unique and worth exploring as not only a 'piece' of beauty, glaciers are also very sensitive climate change indicators. Another dominant of Alaska's landscape is its hydrography. The Yukon River with its tributaries, the Tanana, the Porcupine, and the Koyukon constitute the largest river system of the Region. The Yukon flows into the Bering Sea, the Colville terminates in the Arctic Ocean. The Noatak and Kobuk River with their numerous tributaries are located in northwest of Alaska.

The River Kuskokwim runs south of the Yukon; it goes south of the Yukon and north of the Alaska Peninsula. The Susitna River touches the southern-central region and is draining into the Copper River and Cook Inlet (NPS). As we see, the landscape of Alaska Region is very reach by various mountain ranges and river systems, which possesses tundra and taiga as the most dominant vegetation types having arctic and subarctic climate, which helps forming innumerable habitation zones. It is reach and special land, which was forming with the movements of plates, which was affected by various earthquakes and volcanoes. During the Pleistocene, northern and central Alaska experienced a less glaciation compared to North America.

In the times of the contact with the Europeans, the northern coast of the Alaska Peninsula was occupied by people who were able to adapt to the winter life along icy coasts (NPS). As described above, Alaska region was created by a variety of geologic processes, and that is probably one of the reasons why such diversity cannot be documented although our

technological progress allows the researchers to deepen the scientific horizons to unthinkable limits. The single topic of glaciers only takes so much efforts and time to explore. That is why many controversial debates among geologists provoke new ideas and new inventions and let us hope, this ever-changing character of Alaska will be fully discovered very soon.