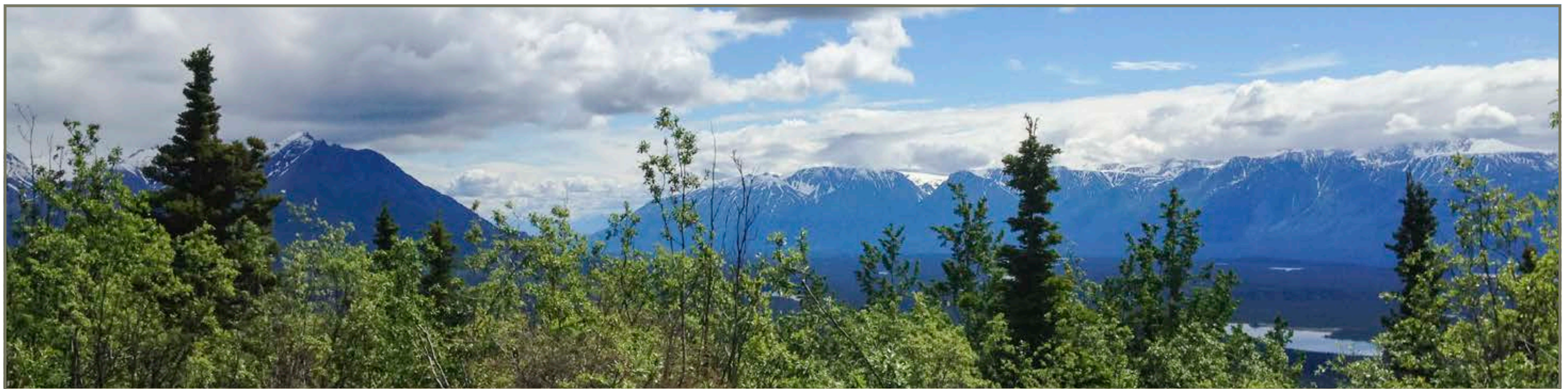
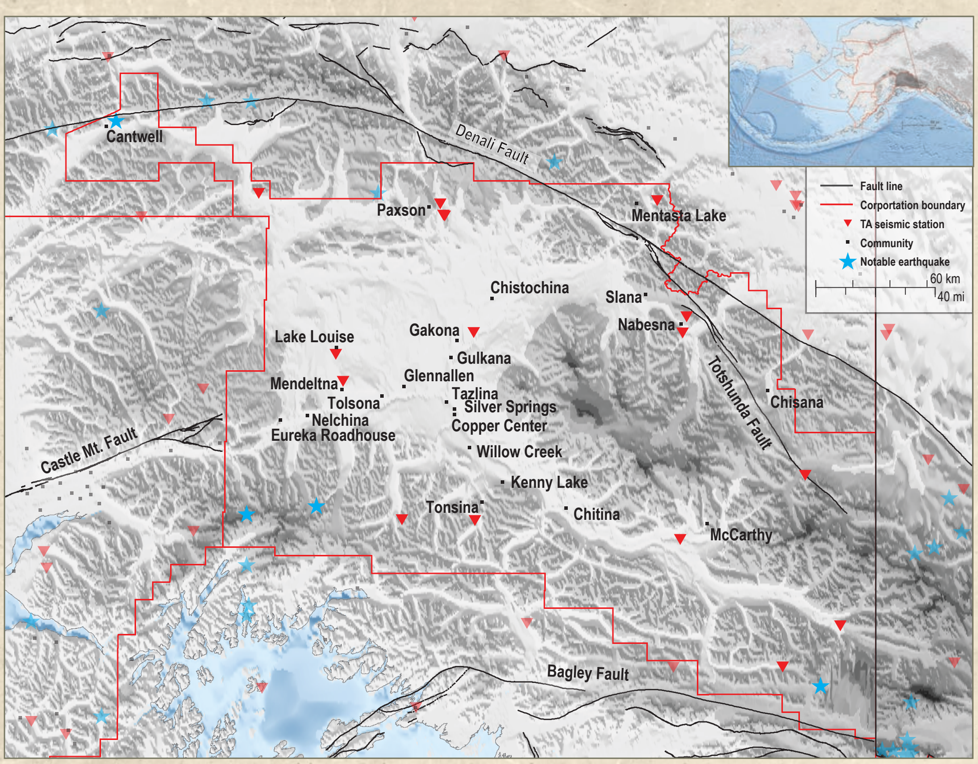


photos courtesy of the Alaska Earthquake Center

EarthScope in the Ahtna, Inc. Region

The nearly 30 communities within the Ahtna, Inc. region, south-central Alaska, experience more than 1,200 earthquakes per year. The earthquakes occur at depths down to 65 miles. Most of these earthquakes go unnoticed, but occasionally larger events are felt. Since 1900, four events have been greater than magnitude 6.0. The largest event within the region was a magnitude 7.4 earthquake on Feb. 28, 1979. The region also experienced a portion of the magnitude 7.9 Denali fault earthquake in November 2002. The region was also heavily impacted by the magnitude 9.2 Great Alaska Earthquake in 1964. These larger events are shown on the map, along with other notable earthquakes surrounding the Ahtna region.

EarthScope plans to install approximately 13 Transportable Array temporary stations during the project's 5-year deployment. The proposed sites are labeled by the red triangles. The Denali fault zone and the Totshunda fault are responsible for the seismicity in the northern portions of the region; however, the story is different to the south. The collision of the Yakutat block, a remnant piece of tectonic plate, and the subduction of the Pacific plate beneath Alaska dominate the seismicity of the area. The region is also home to 11 volcanic features.



"the nearly **30 communities** within the Ahtna, Inc. region experience more than **1,200 earthquakes** per year"

Top 15 Earthquakes Worldwide:

1) M9.5 Chile, 1960
2) M9.2 Prince William Sound, Alaska, 1964
3) M9.1 Northern Sumatra,Indonesia, 2004
4) M9.0 Honshu, Japan, 2011
5) M9.0 Kamchatka, 1952
6) M8.8 Maule, Chile, 2010
7) M8.8 Ecuador, 1906
8) M8.7 Rat Islands, Alaska, 1965
9) M8.6 Northern Sumatra, Indonesia, 2005
10) M8.6 Assam - Tibet, 1950
11) M8.6 Northern Sumatra, 2012
12) M8.6 Andreanof Islands, Alaska, 1957
13) M8.5 Southern Sumatra, Indonesia, 2007
14) M8.5 Banda Sea, Indonesia, 1938
15) M8.5 Kamchatka, 1923

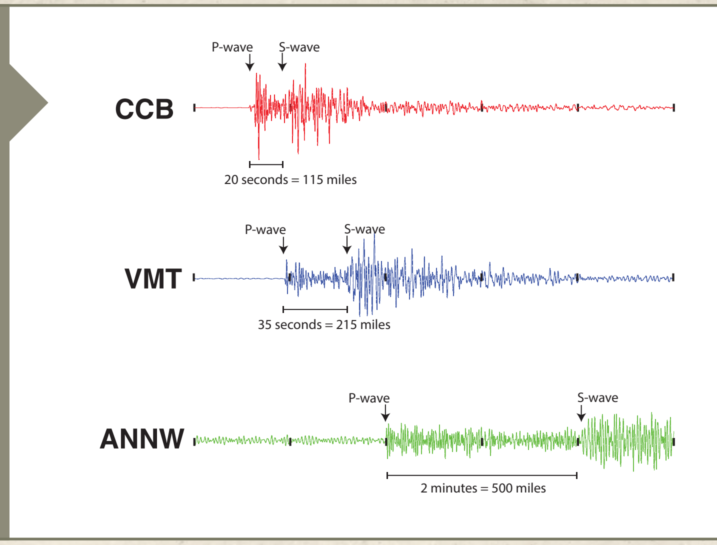
EarthScope stations can help us understand Alaska

How parts of Alaska behave are still somewhat unknown. Scientists use earthquakes and the energy waves they produce to get an idea of what is happening below our feet. More stations spread across Alaska will increase our understanding of unmonitored parts of the state. Earthquakes can be located in two steps. Two waves of energy are released when an earthquake occurs. The P-wave, or primary wave, behaves like a pulse. The S-wave, or shear or secondary wave, behaves like a snake with the energy vibrating from side to side, or up and down, as the wave moves forward traveling slower and arriving later. Since these waves travel at different speeds and arrive at a seismic station at different times, the time difference between the two arrivals can be measured.

Step 1.

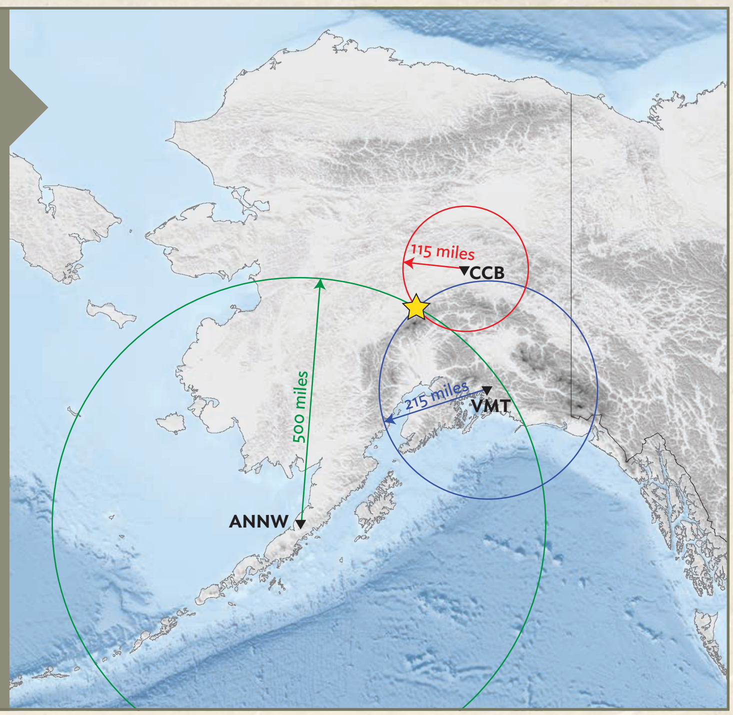
Seismologists measure the time between P- and S-wave arrivals. From numerous observations, scientists know the relationship between the S-P time and the distance between an earthquake and the station recording it. They convert this time difference into a distance for each station that recorded the earthquake.

Waveforms from a magnitude 5.4 earthquake in central Alaska. CCB is the Clear Creek Butte station. VMT is a station in Valdez. ANNW is a station on Aniakchak Volcano.



Step 2.

Once the distance is calculated for three stations, the earthquake's location can be calculated. A circle centered on each station is drawn with the circle's radius equal to the distance the station is from the earthquake. The point where all three circles intersect is the location of the earthquake. If a fourth station is used and the circles become spheres, a depth can be calculated in the same process. Seismologists use computers to get the most accurate earthquake location possible by analyzing data from all stations that recorded the event. To locate the station nearest you, view waveforms at that station or view waveforms from located earthquakes visit rev.seis.sc.edu.



EarthScope facilities are funded by the National Science Foundation and are being operated and maintained as a collaborative effort by UNAVCO Inc. and the Incorporated Research Institutions for Seismology (IRIS) with contributions from the US Geological Survey and several other international organizations. This material is supported by the National Science Foundation under Grant No. EAR-0733069. UAF is an AA/EO employer and educational institution.

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