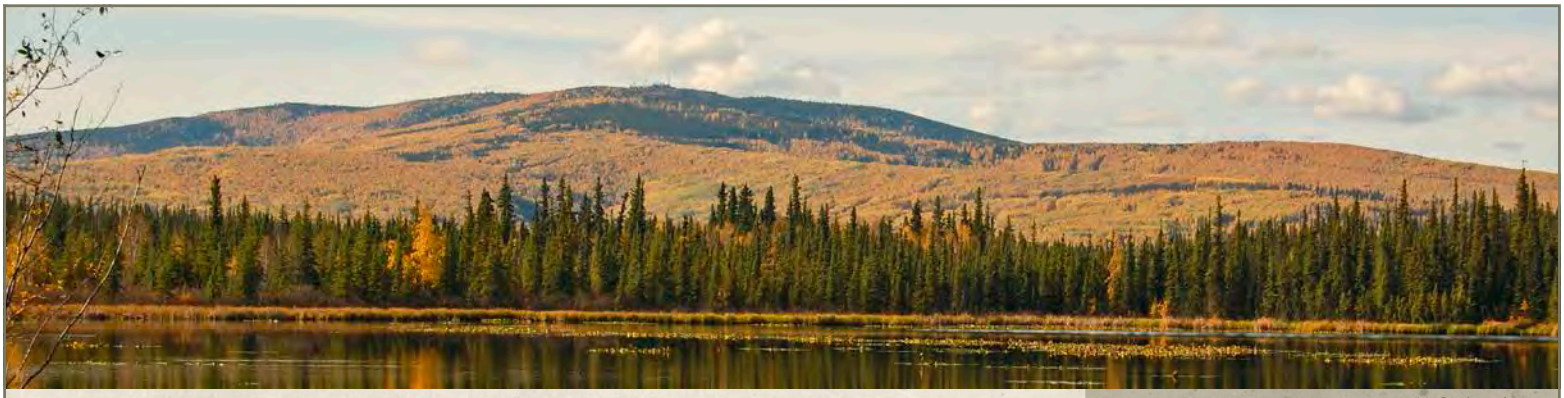
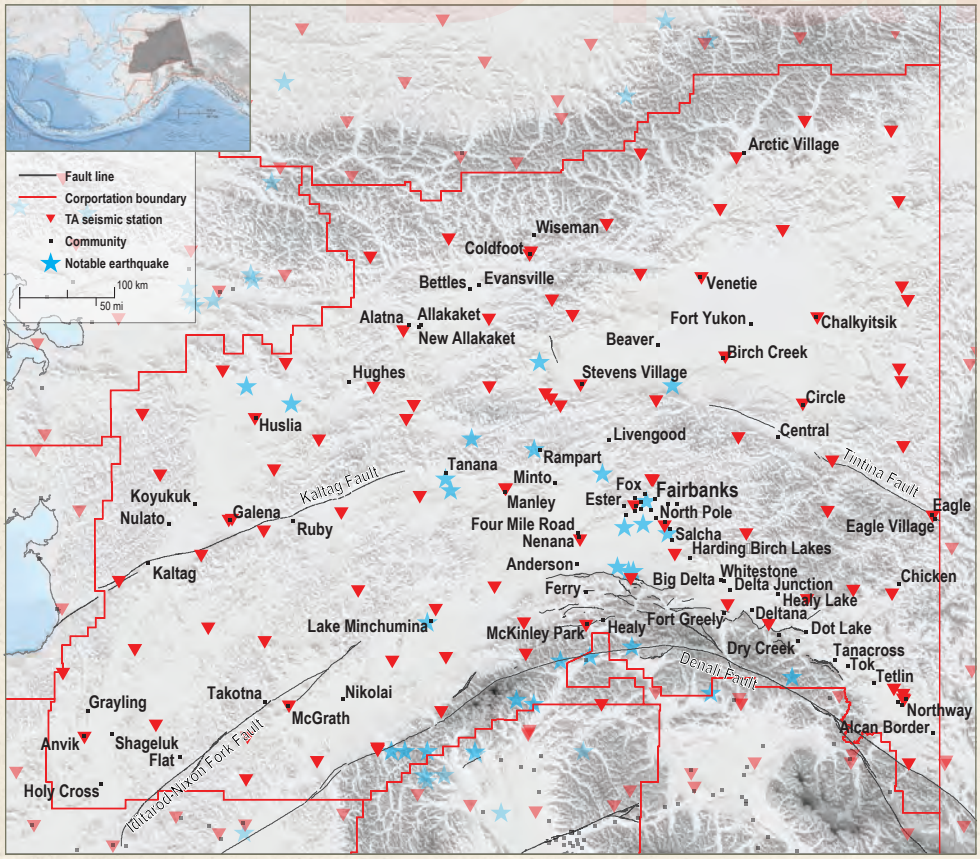


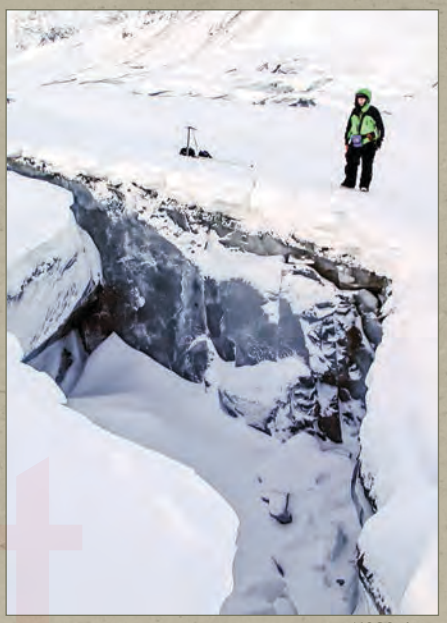
M. Gardine photo

EarthScope in the Doyon, Limited Region

The roughly 57 communities within the Doyon, Ltd. region in central Alaska experience more than 8,000 earthquakes per year. The earthquakes occur at depths down to 125 miles. Most of these earthquakes go unnoticed, but occasionally larger events are felt. Since 1900, 27 earthquakes have been greater than magnitude 6.0. The largest event in the region was a M7.9 earthquake on the Denali Fault on Nov. 3, 2002. These larger events are shown on the map, with other notable events surrounding the Doyon region.

EarthScope plans to install approximately 60 Transportable Array temporary stations during the project's 5-year deployment. The proposed sites are labeled by the red triangles. There are four large fault zones in the Doyon region, the Tintina fault, the Kaltag fault, the Iditarod-Nixon Fork fault, and most notably, the Denali fault. These fault zones act as stress relievers for the highly seismically active southern regions of Alaska.





USGS photo

"57 communities within the Doyon, Ltd. region experience more than 8,000 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, Indonesia, 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

Draft

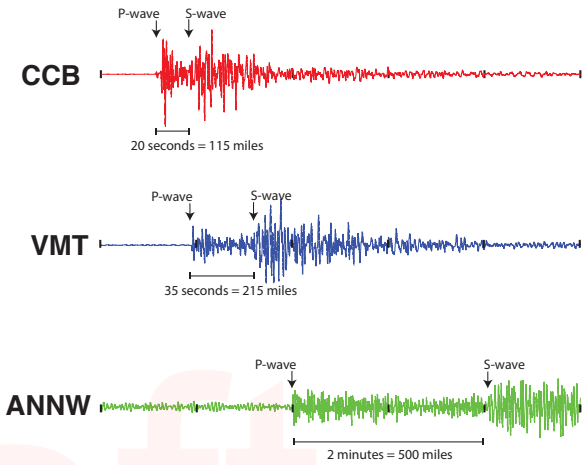
EarthScope stations can help us understand Alaska

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.

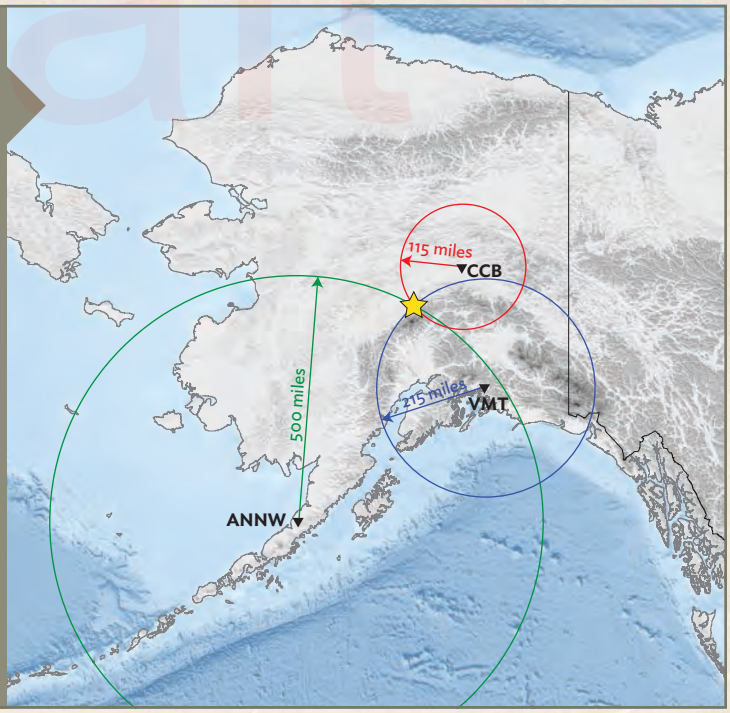
Seismologists measure the time between P- and S-wave arrivals. From numerous observations, scientists know the relationship between the S-P time and the distance between an earthquake and the station recording it. They convert this time difference into a distance for each station that recorded the earthquake.

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.



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