

Barry Arm seismic and webcam

Preliminary summary

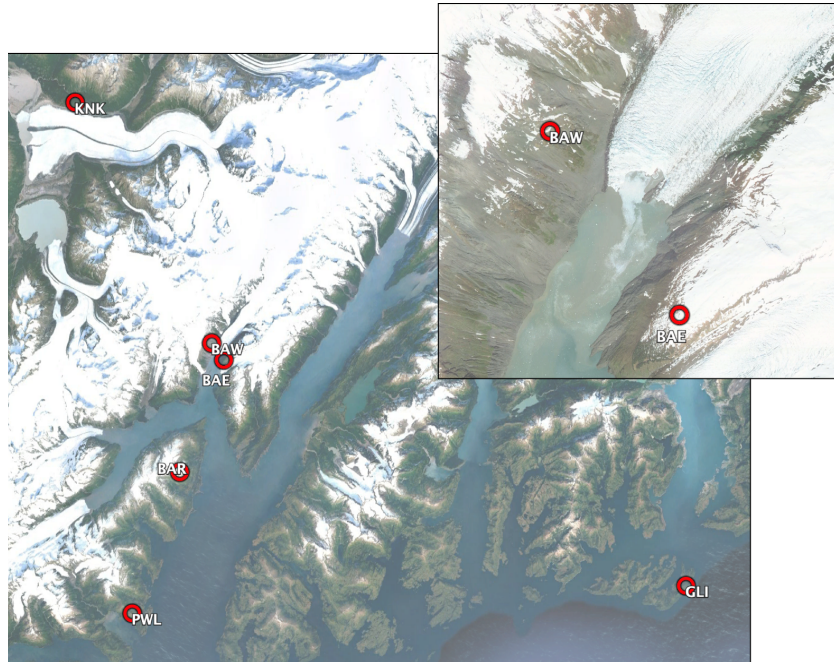
Update: 2020-09-18

Installations

Overview map

In early September, the Alaska Earthquake Center installed two seismic stations, one webcam, and a repeater in the Barry Arm region. The installations were pieced together primarily from ‘on-the-shelf’ equipment and materials.

Location of stations BAW and BAE, the repeater (BAR), as well as next closest seismic stations in the network: Knik, Port Wells, and Glacier Island. ([image](#), [kml file](#))



Mt. Doran repeater

location: 61.0116, -148.2226
(WGS84)

This site is referred to informally as BAR. It has an antenna pointed to Barry Arm that can receive UHF radio from both sites. Data are passed from the radio to a cell modem. The cell modem connects to Verizon’s network, but has an AT&T sim card as well. In case of an outage, the modem is supposed to fail-over to the AT&T network. This failover capability has not been tested however.



Mt. Doran repeater with Barry Arm in the background. ([image](#))

AK.BAW (Barry Arm West)

location: 61.1501, -148.1501, 542 m (WGS84)

on date: 2020/09/04

broadband sensor: Nanometrics Trillium 120 Posthole, 3-channel, 50sps

strong motion sensor: Nanometrics Titan 4g

datalogger: Quanterra Q330



Station BAW looking north ([image](#))



Station BAW looking south. Repeater (red arrow) is on the left shoulder of Mt. Doran. ([image](#))



Seismometer installations. Broadband posthole sensor is in the lower center of figure. Strong motion sensor is in front of the door inside white PVC container. ([image](#))

AK.BAE (Barry Arm East)

location: 61.1319, -148.1234, 578 m (WGS84)

on date: 2020/09/04

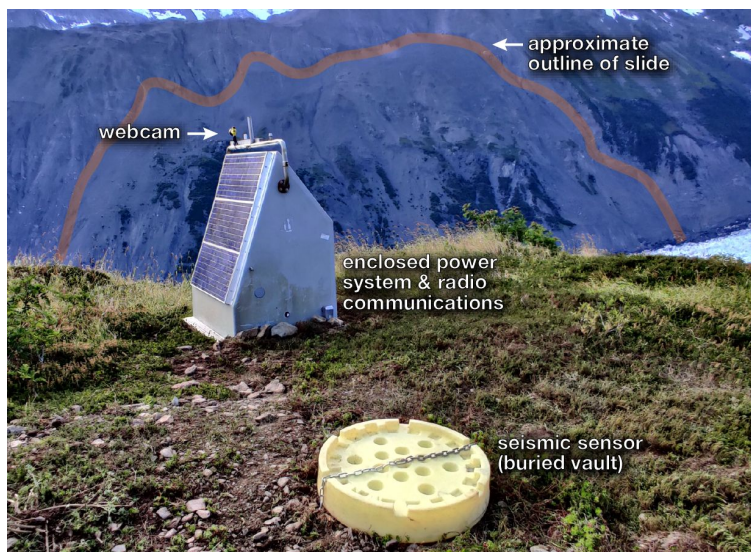
broadband sensor: Nanometrics Trillium 120,
3-channel, 50sps

strong motion sensor: Nanometrics Titan 4g

datalogger: Quanterra Q330

camera: Lorex 4K webcam

AK.BAE seismometer vault and trench for cables
([image](#))



Annotated view of station BAE. ([image](#))

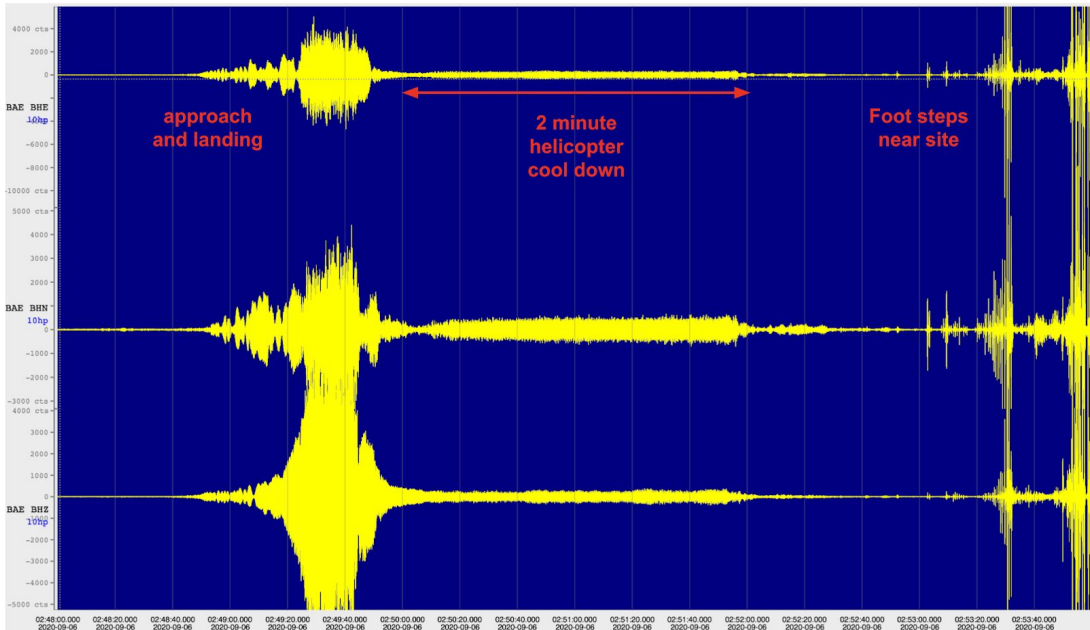
View from BAE webcam.
Downloaded Sept. 14, 2020
at 7:40pm. It may be
possible to grab a higher
resolution image, though
bandwidth is a challenge.
Station BAW is marked
with red arrow. ([image](#))



Early data examples

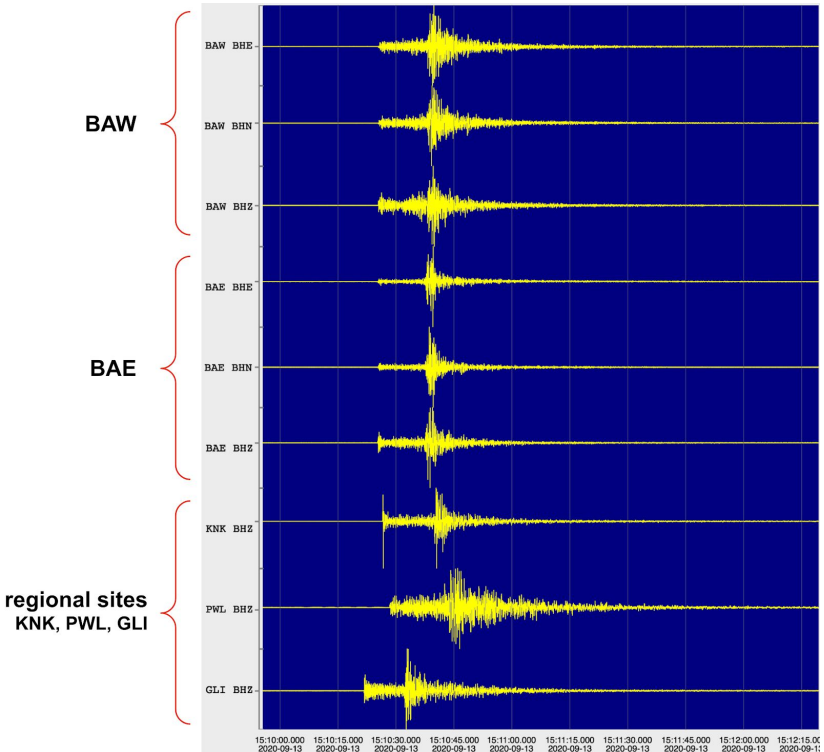
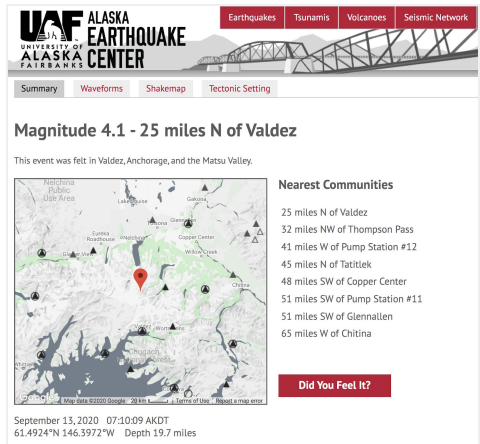
Helicopter Landing

Six-minute seismogram from BAE. I include this mostly for interest. It shows the final visit from the installation team on the evening of Sept. 5 AKDT at BAE. The three lines reflect the three components of motion: E-W, N-S, up-down. [\(image\)](#)



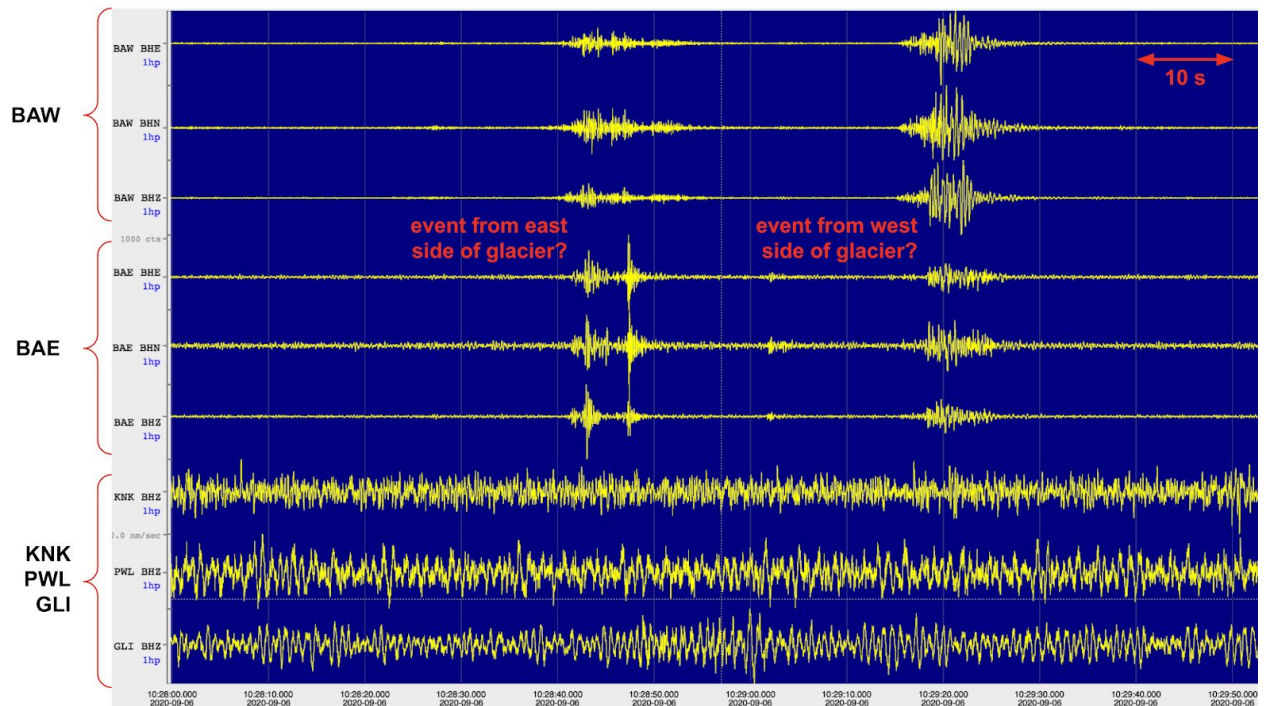
Regional earthquake sample

M4.1 earthquake north of Valdez. Data from BAE and BAW generally perform on par with other stations in the region. They are however, overprinted with significant signals from nearby glaciers and the fjord.[\(image\)](#)



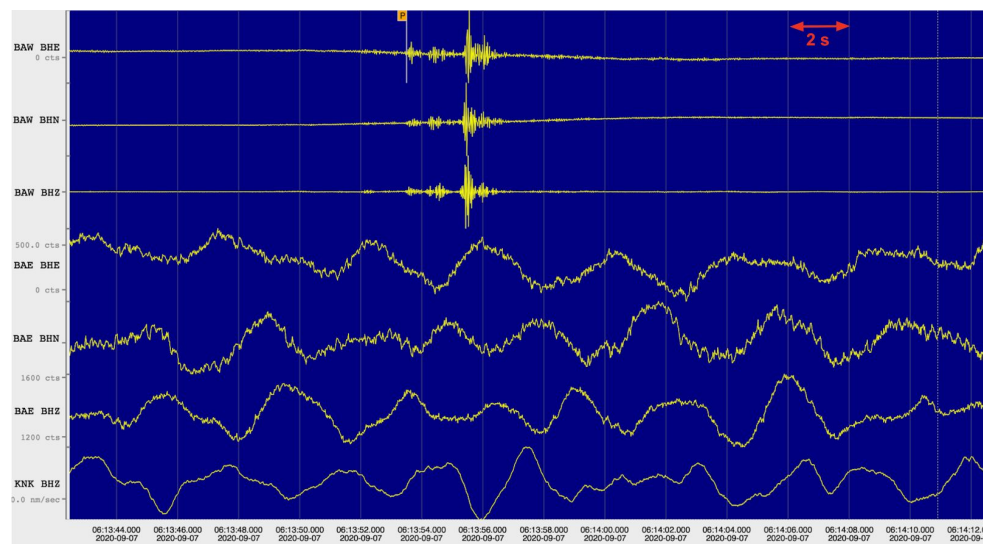
Small glacier event examples

Two-minute time window. First event is more prominent on the east side of the fjord. Second is more prominent on the west. It is likely that these represent glacier events from different sides of the Barry terminus. It is also possible that these sources are originating from Cascades or Coxe glacier. ([image](#))



High frequency BAW example

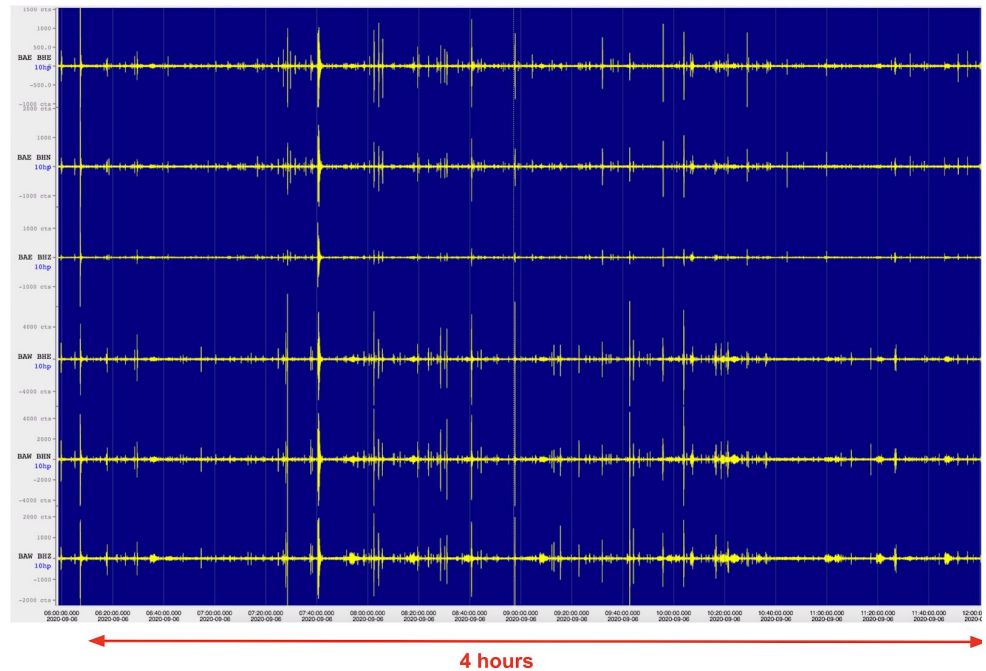
This is a ~three-second signal visible only on BAW (regardless of filters). The signal is very large (~50,000 count amplitude). However, it is not observed at BAE just 2.5 km away. Seems to grow gradually. Could be a very rockfall but is a little short in duration? Applying a 10Hz HP filter barely changes the signal at all. Nearly all of the energy is above 10Hz. Presumably, much of the energy is above the 25 Hz Nyquist frequency of the data. Similar signals are seen throughout the BAW data. ([image](#))



Typical seismic activity

This 4-hour record of BAW and BAE (three components each) shows persistent seismic events that (more or less) appear equally on both sides of the fjord. We presume this is largely energy from the terminus of the glacier. It will be interesting to see if/how this becomes more quiet when we approach winter.

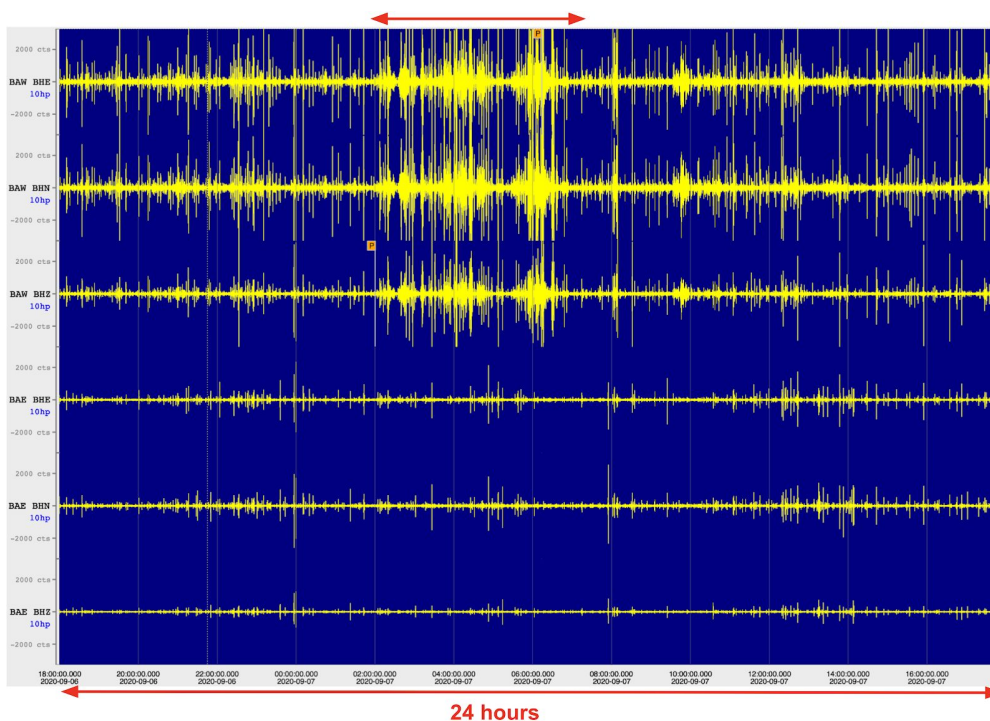
([image](#))



Active seismic activity

Some time periods, however, show considerable activity at BAW that does not appear on BAE. These signals are clearly coming from the western side of the fjord. On this scale it is not possible to

determine the source of the signal. However it appears to comprise large numbers of discrete events and not continuous tremor. This argues more for rockfalls, cracking, or stick-slip events instead of the continuous energy that might be expected from, say, flowing water. But it is pretty premature at this point to speculate much further. ([image](#))



Data availability

Seismic data availability

Continuous waveform data is openly available through the IRIS Data Management Center beginning Sept. 14. It can be streamed live or requested for specific snippets. Data includes three channels each of broadband (BHE, BHN, BHZ) and strong motion data (BNE, BNW, BNZ), as well as an extensive set of state-of-health channels.

full data channel descriptions at IRIS ([BAW](#), [BAE](#))

sample waveform images ([BAW](#), [BAE](#)) - adjust the URL to see different time periods

Webcam data availability

As of mid-September the webcam data is only available via a private LAN internal to the Earthquake Center. We are working with partners to establish a mechanism to archive and disseminate images publicly. The webcam draws significant power and is currently set to cycle on for 10 minutes at the beginning of each hour.

Known issues

All sorts of environmental issues could cut the data flow tomorrow. High wind, critters, lightning, power system issues, other acts of God, and (notably) bears. In this case, the sites are likely to sit idle until summer 2021. That would be unfortunate, though is fully possible.

The webcam is bandwidth hungry. Retrieving images at a rate of more than one or two per hour is unlikely at this time. When camera data is being retrieved it can clobber the BAE seismic data. The seismic datalogger buffers these data and the data appear to backfill without issue after the image is finished transmitting. But it demonstrates the bandwidth limitations.