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GEOPHYSICS

Seismic array shifts to Alaska

USArray plumbs shifting tectonic plates and offers improved earthquake monitoring

By **Julia Rosen**

As fall takes hold, it's getting darker in Alaska. But underneath the state, the lights just turned on. On 27 September, near the coastal city of Wainwright, the last of 193 seismic stations was installed—completing a grid of 280 instruments that stretches across Alaska and northwest Canada, and kicking off the final phase of the USArray project. In 2004, the phalanx of transportable stations began advancing eastward across the lower 48, using the shivers of earthquakes to cre-

most active subduction zones on the planet, where the Pacific Ocean's tectonic plate dives under North America's in a grinding collision that generates earthquakes and volcanoes. Much of the region is made up of slivers of marine sediments and rocks that were scraped off the subducting slab and onto the continent. Studying the thickness of Alaska's crust could help geologists better define these fragments and understand how the state was assembled, says Jeff Freymueller, a geophysicist at UA.

Researchers also want to get a glimpse of the subducting slab itself. Deep parts of

A USArray seismic station is deployed near the Ungalikthiuk River in Alaska.

stations' ability to collect and transmit data. Roughly half of the stations have been outfitted with weather instruments and Carven Scott of the National Weather Service's Alaska Region in Anchorage says the data have already improved forecasts. In a place where many people get around in small planes, that can save lives.

These benefits explain why many Alaska scientists want some of the stations to stay in the state for the long run. "If we completely

Science magazine, October 6, 2017



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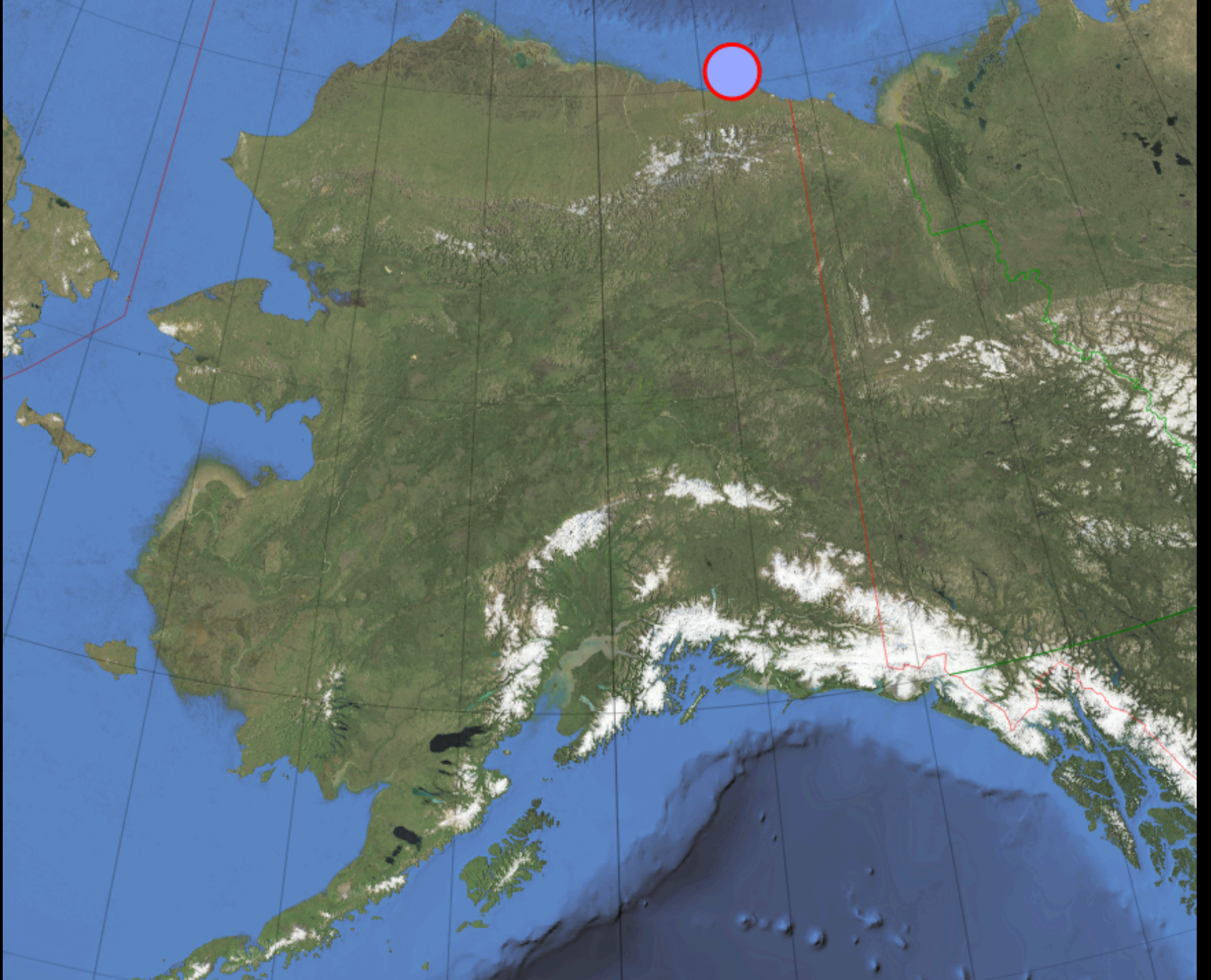
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Camden Bay

C26K BHZ

Jago River

C27K BHZ

Malcolm River, YT

D27M BHZ

Kavik River

D25K BHZ

Pump Station #1

PS01 BHZ

Franklin Bluffs

C24K BHZ

Babbage River, YT

E28M BHZ

Happy Valley

D24K BHZ

Coleen River

E27K BHZ

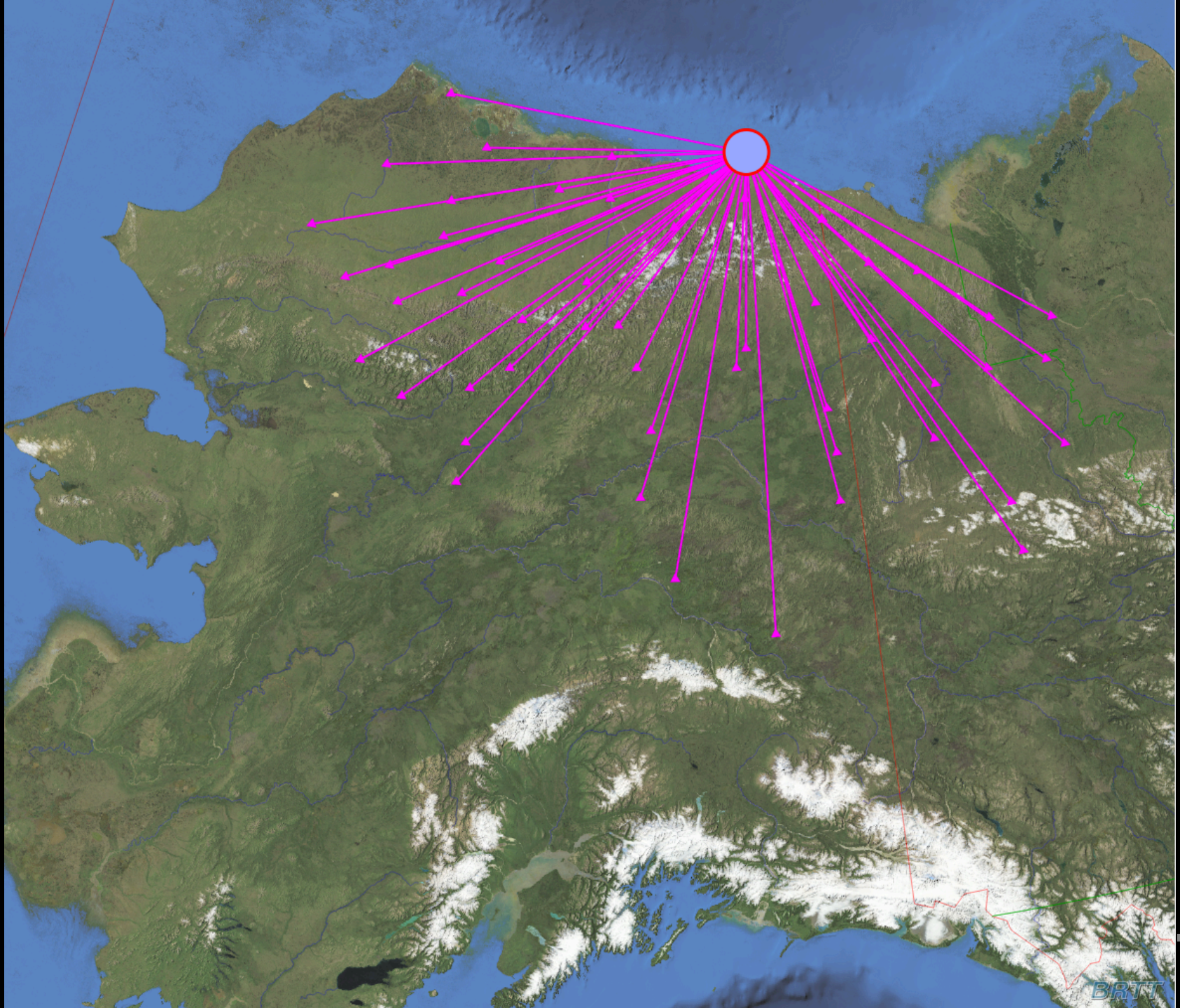
Nanushuk River

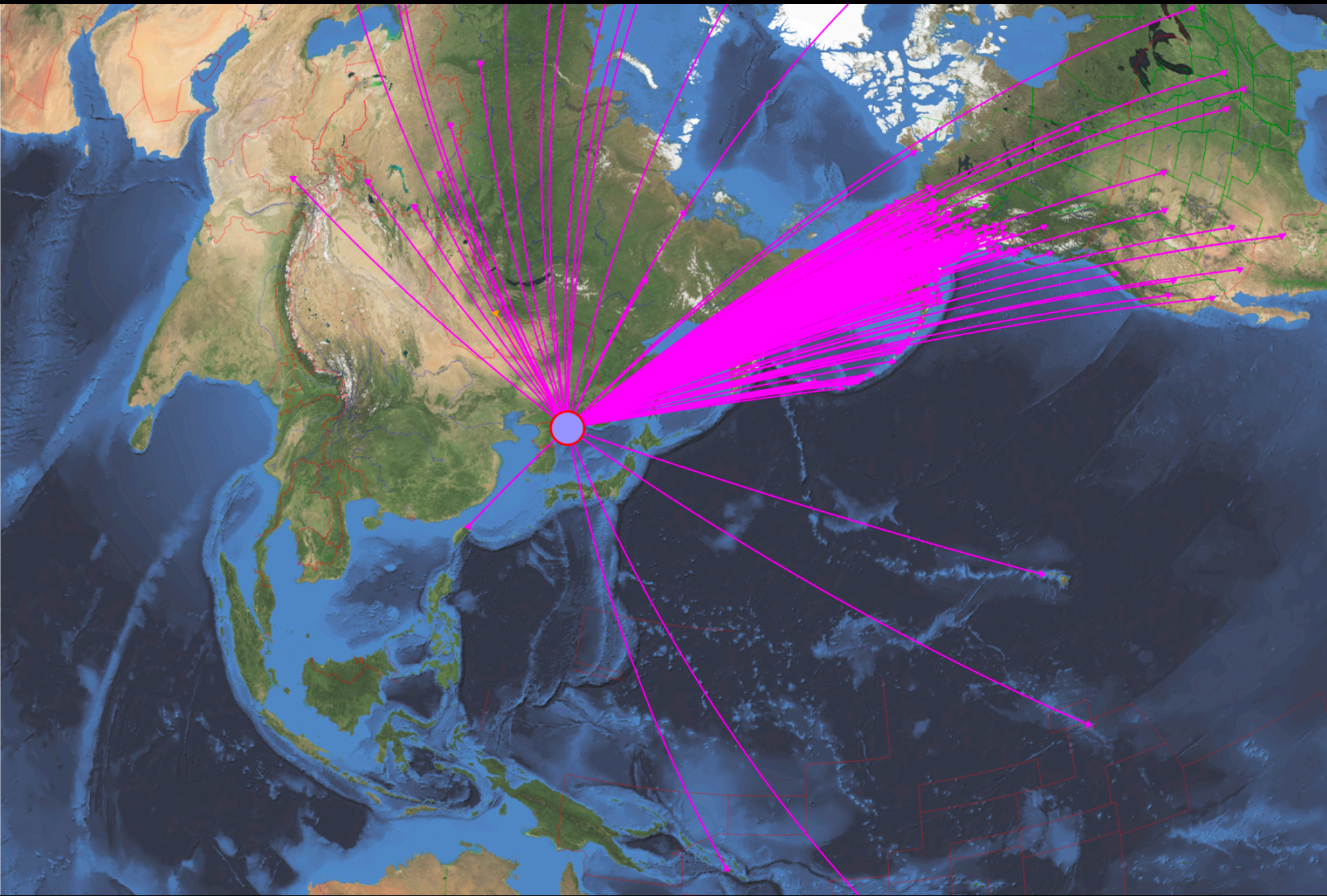
C23K BHZ

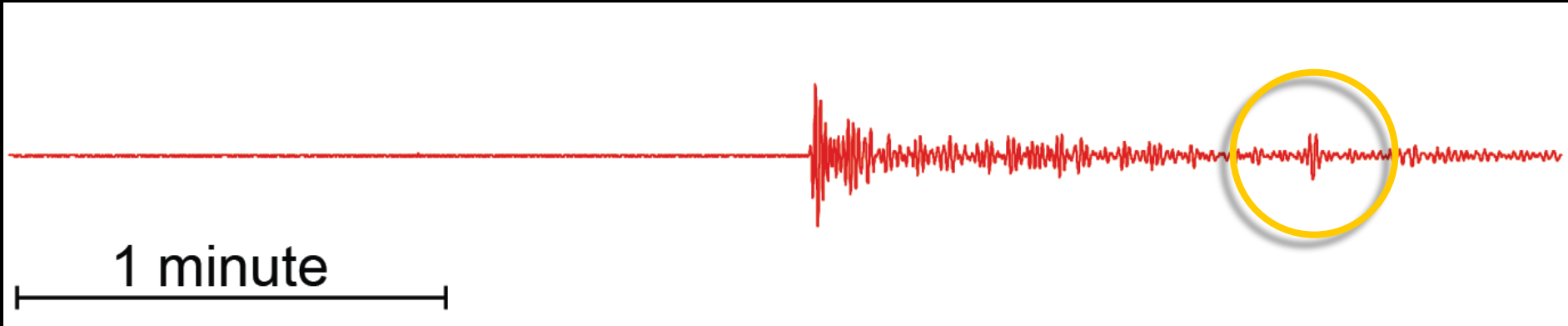
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filtered on 0.8-25 Hz

2 minutes

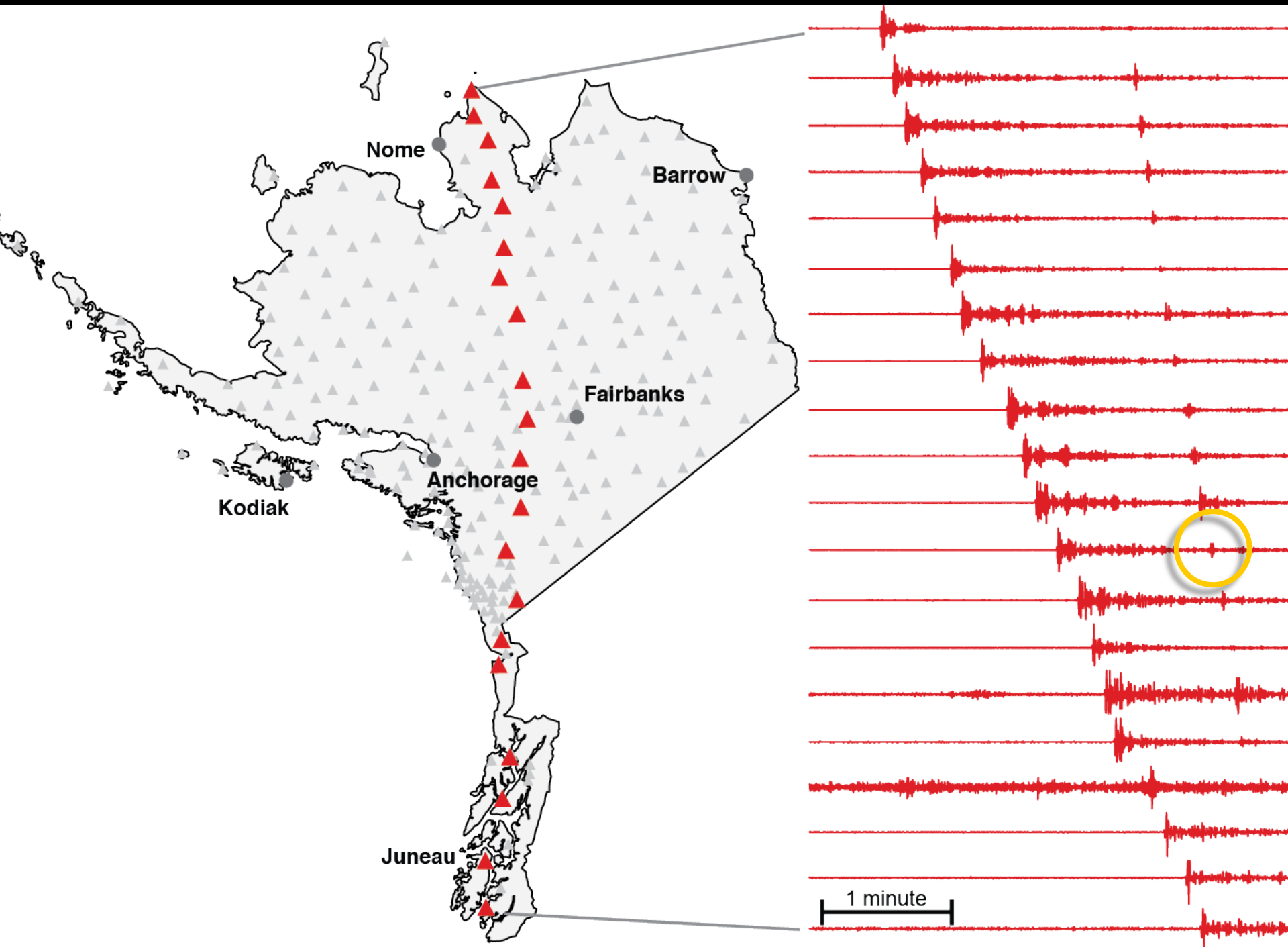


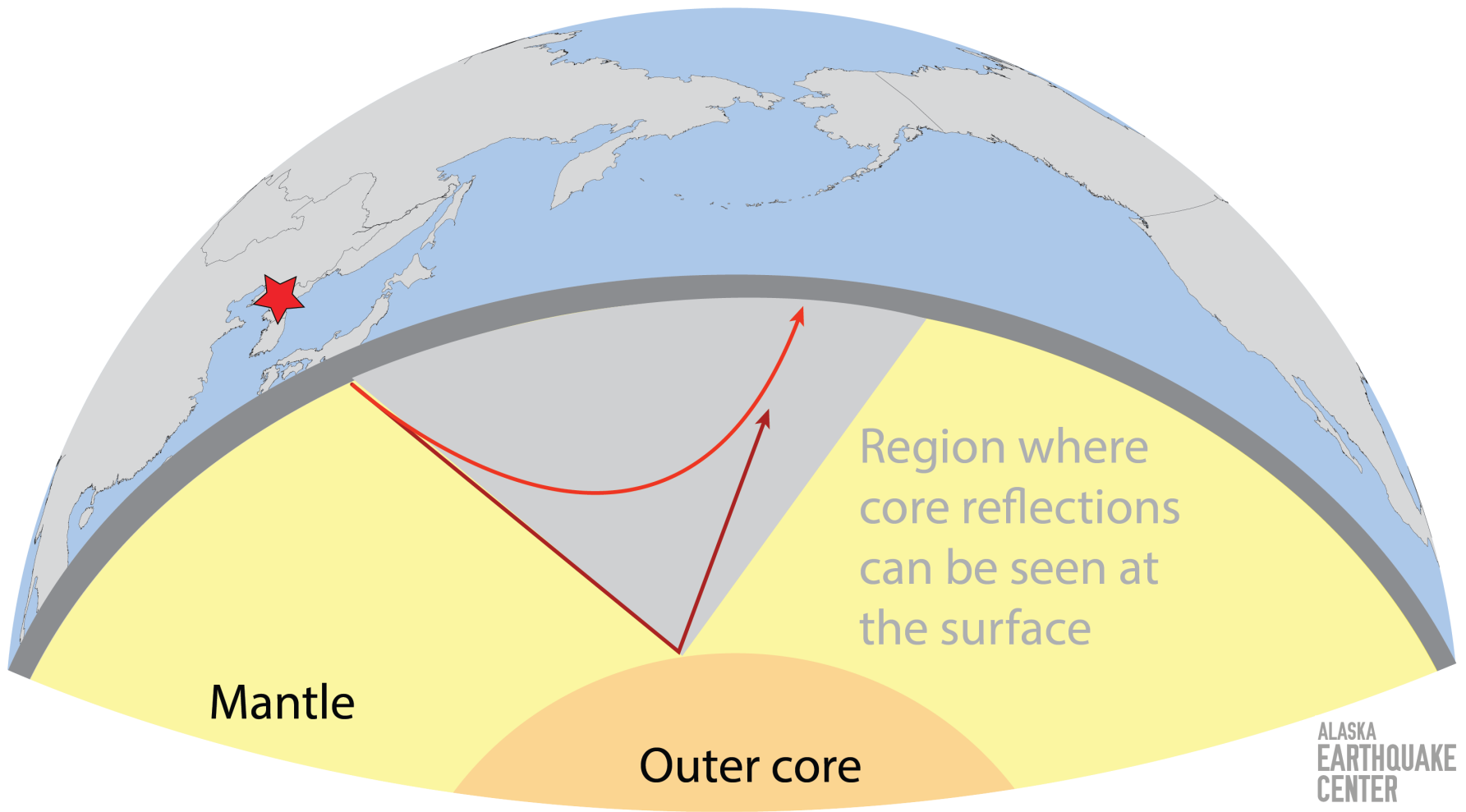






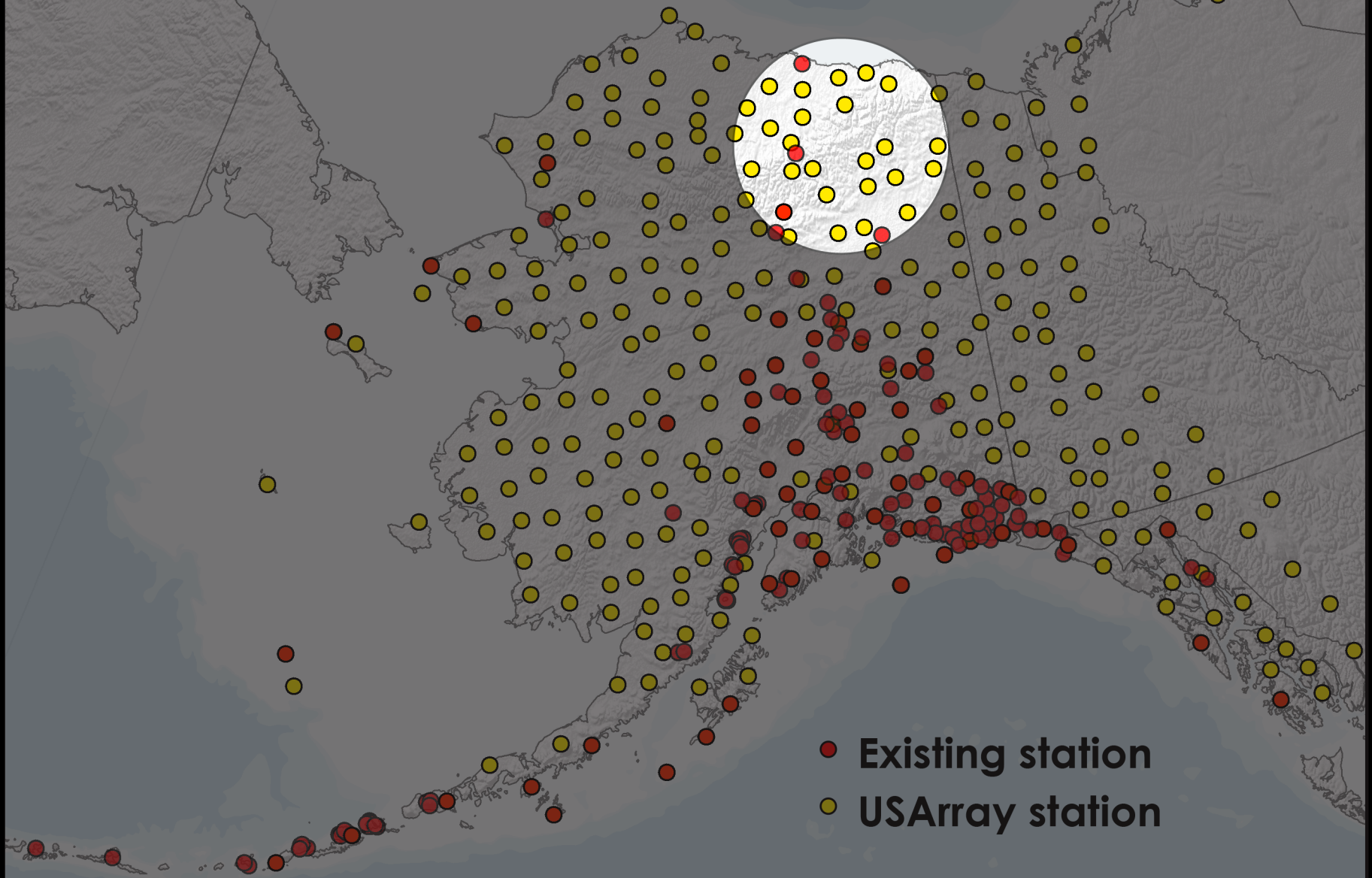
1 minute





Seismic stations in Alaska

broadband telemetered

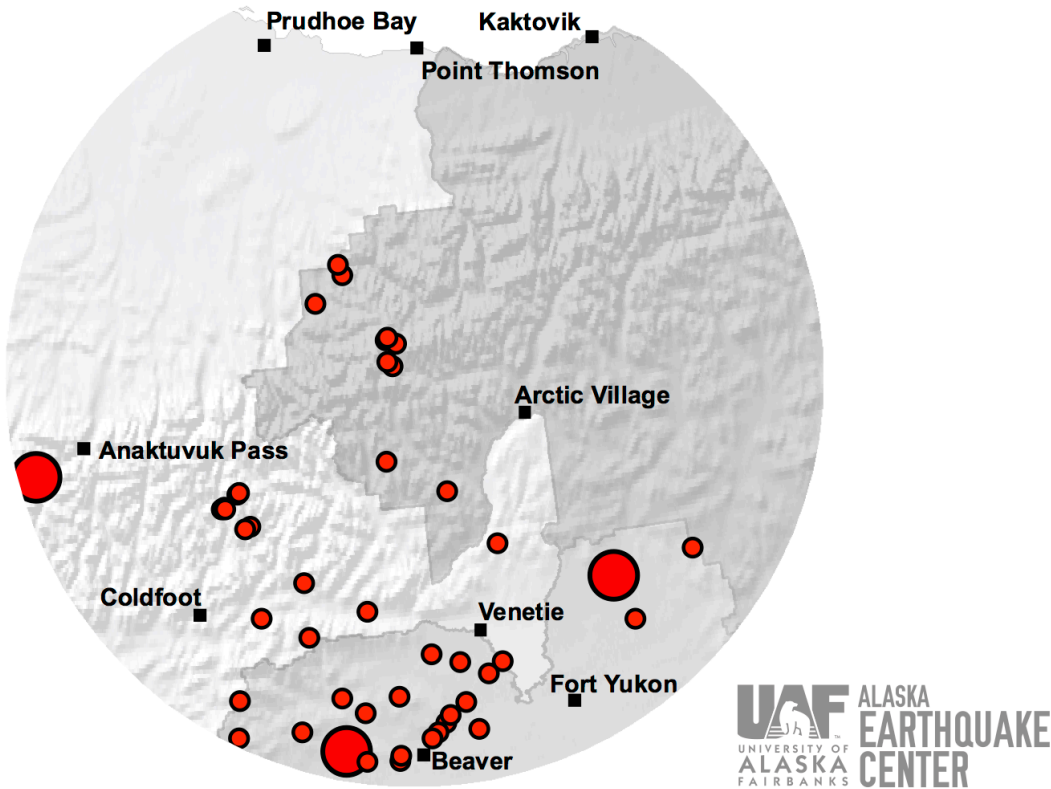


● Existing station



● USArray station

Without USArray

July - December 2015

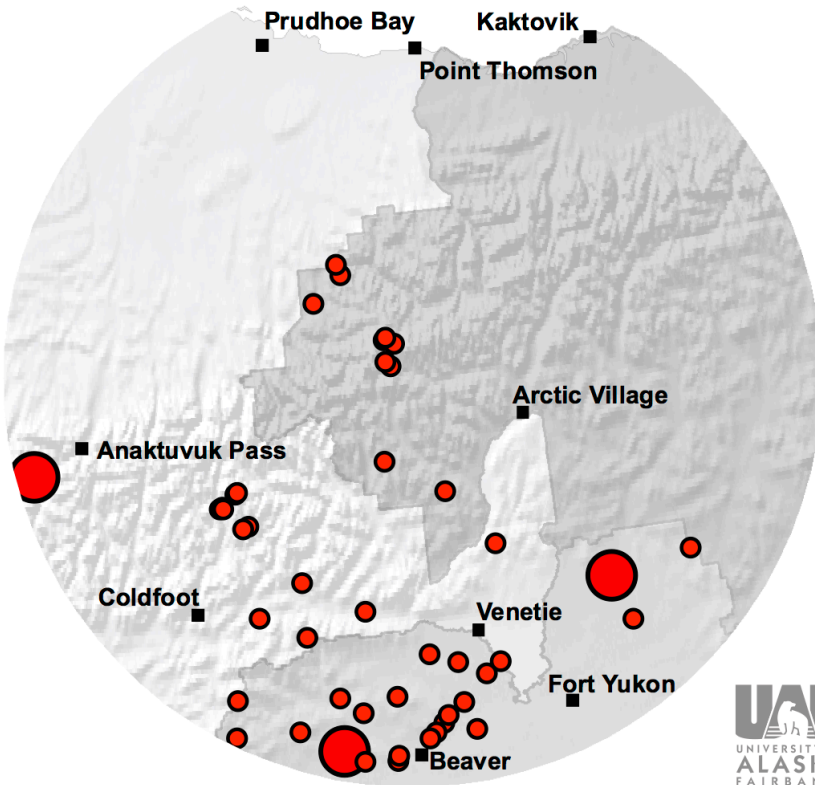


Reliably located earthquakes. Maps include earthquake locations that are known accurately within 3 miles. Larger circles represent earthquakes with magnitude 3 and greater.

-  Yukon Flats Wildlife Refuge
-  Arctic National Wildlife Refuge

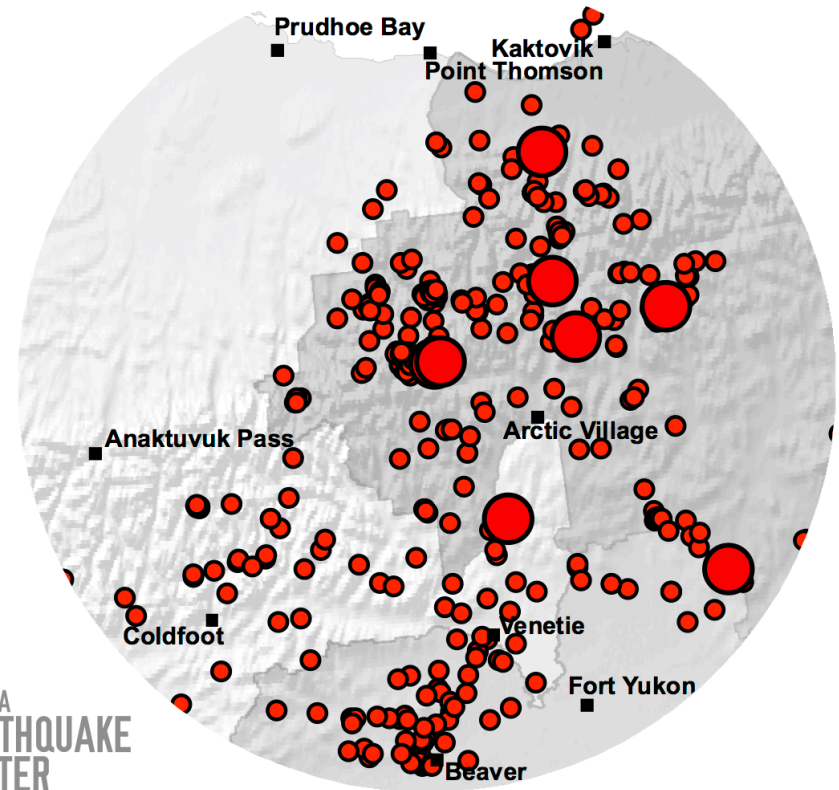
Without USArray

July - December 2015



With USArray

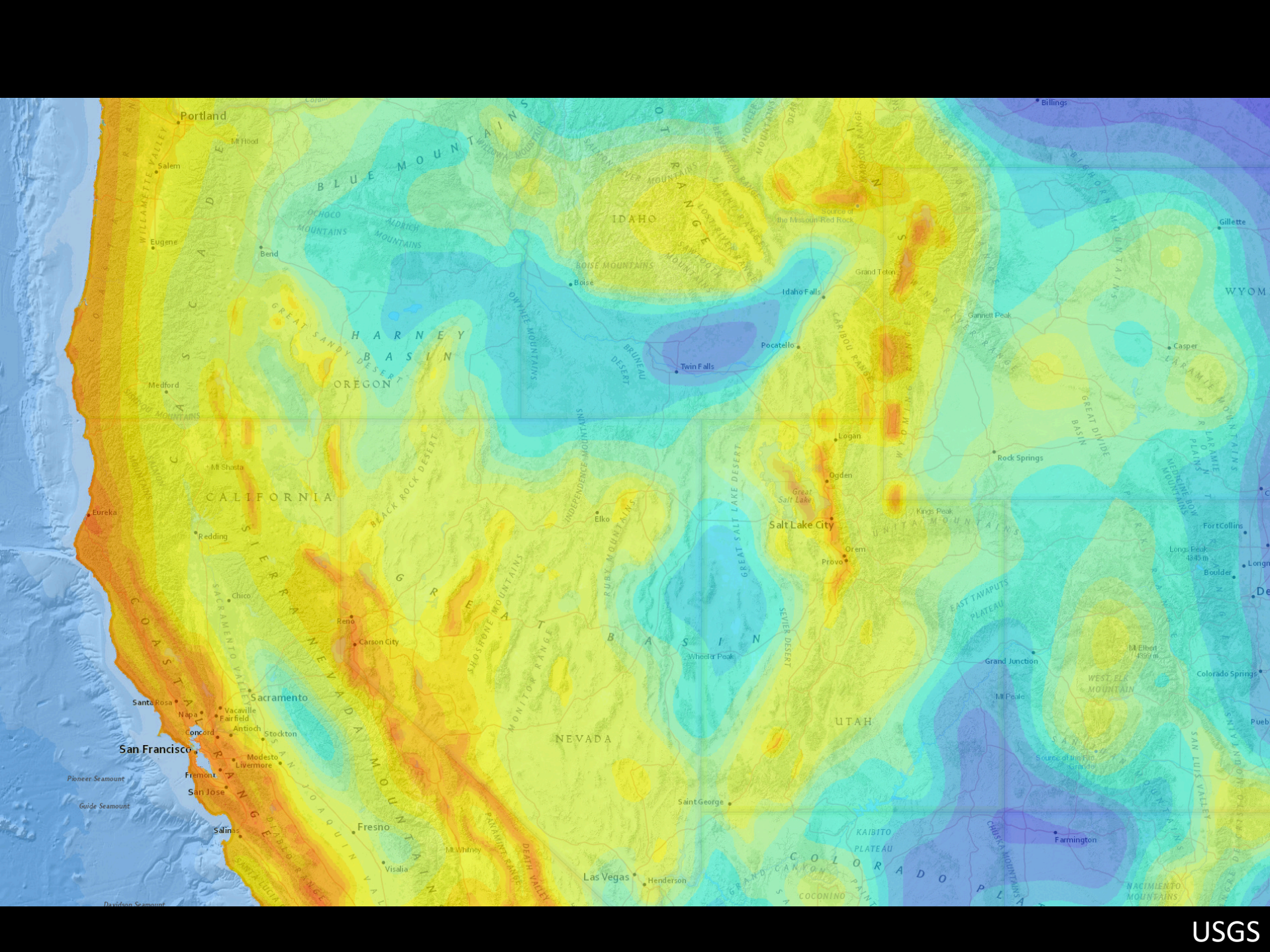
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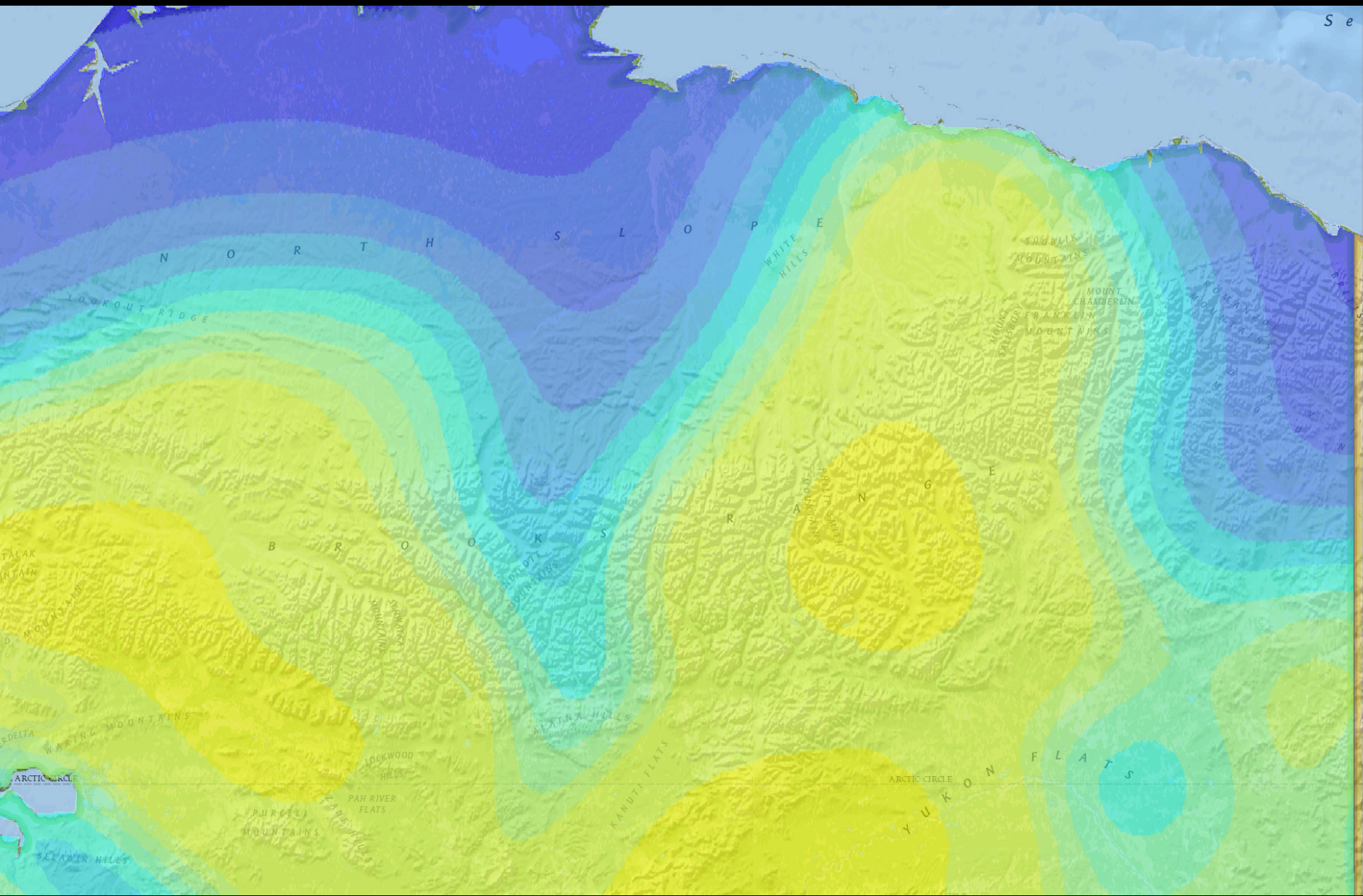


UAF ALASKA
UNIVERSITY OF
ALASKA
FAIRBANKS EARTHQUAKE
CENTER

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Yukon Flats Wildlife Refuge
Arctic National Wildlife Refuge





PHASE 1



PHASE 2

