



IGPP Virtual Seminar Series

Ryan Hardy
NOAA

In Pursuit of Geoid Change in Alaska

Date: Tuesday, Jan 19, 2021

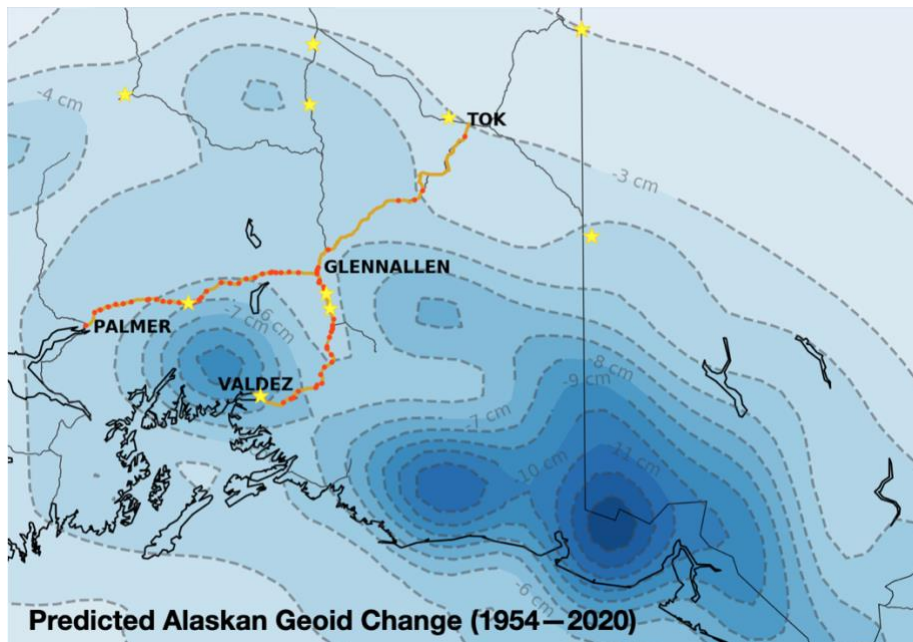
Time: 12:00 pm, Pacific Time

Host: El Knappe (eknappe@ucsd.edu – if you have questions)

Zoom link (password = alaska): [click here to join meeting](#)

Meeting ID: 996 3598 4458

Because this meeting will be recorded, please make sure that you are comfortable with it before registering



NOAA's National Geodetic Survey (NGS) is developing a new geopotential datum to serve as the basis for heights in the United States. The geoid model defining this system requires a temporal component to maintain 1-centimeter accuracy over its lifetime. While temporal gravity models derived from GRACE measurements accurately capture regional geoid change in most areas, concentrated ice mass loss in Alaska introduces errors of omission of more than 1 centimeter per decade. We demonstrate this by augmenting GRACE models with airborne altimetry of glaciers. The enhanced model gives us predictions for changes in gravity, height, and astronomical deflections of the vertical that could be validated in the field by revisiting historical measurements.

NGS is well equipped to measure height and gravity but did not possess operational hardware for geodetic astronomy in 2019. To close this gap, we developed the Total Station Astrogeodetic Control System (TSACS), which automates the collection of astronomical data with an NGS-owned robotic total station. This system has been tested extensively throughout the DC area. It will allow us to revisit historical astronomical sites in Alaska. Its ability to profile the present-day geoid permits us to compare present-day GNSS heights to historical heights from leveling.

By surveying gravity, heights, and deflections of the vertical in Alaska, NGS may soon be able to measure geopotential change in Alaska at a scale inaccessible to satellites.