Aoki, S., and S. Shige, 2021: Large precipitation gradients along the south coast of Alaska revealed by spaceborne radars. *J. Meteor. Soc. Japan*, **99**, 5-25. https://doi.org/10.2151/jmsj.2021-001.

Plain Language Summary: At high latitudes, discriminating the phase of precipitation, as well as amount, is crucial in grasping the hydrological cycle. This study investigates the horizontal and vertical distribution of precipitation along the south coast of Alaska, using two spaceborne radars: the Dual-frequency Precipitation Radar (DPR) KuPR onboard the Global Precipitation Measurement (GPM) Core Observatory and the Cloud Profiling Radar (CPR) onboard CloudSat. It reveals that the precipitation phase and amount considerably change with the distance from the coastline.

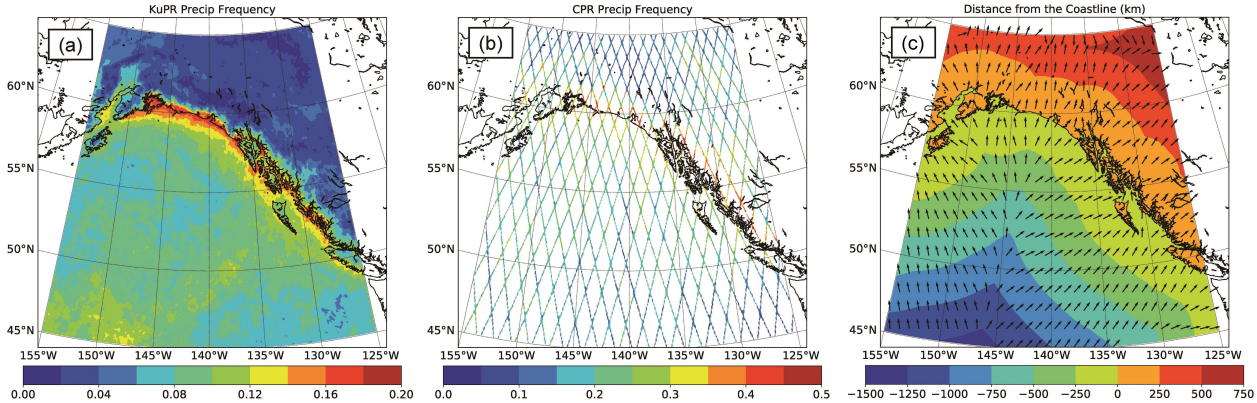

Figure 1. (a) Five-year-mean KuPR precipitation frequency from April 2014 to March 2019, (b) 4-year-mean CPR precipitation frequency from January 2007 to December 2010, (c) (shading) distance from the nearest coastline and (vector) cross-barrier direction around the Gulf of Alaska.

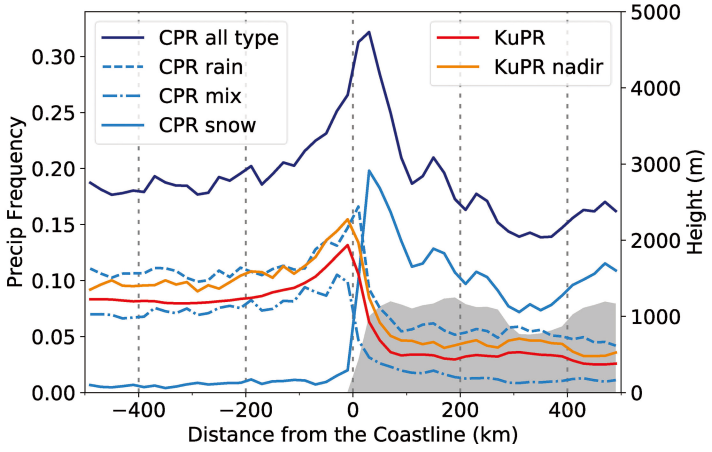

Figure 2. Relationship between the distance from the coastline and CPR precipitation frequency for three types of precipitation particle phase (rain, mixed-phase, and snow), and KuPR precipitation frequency for all angle and only-nadir observations. Gray shading represents the average terrain elevation.

- Precipitation frequencies evaluated by the two spaceborne radars have their maximum values in different region: the KuPR-detected frequency has over the coastal waters (−20–0 km), and the CPR-detected frequency has over the coastal mountains (20–40 km).
- The difference arises because light-to-moderate snowfall frequently occur over the mountains, whereas rainfall and mixed-phase precipitation are dominant over the ocean.
- Moisture flows associated with extratropical cyclones from the Gulf of Alaska are blocked by terrain and delayed around the coast, leading to long-lasting precipitation along the coastline.