

Science, Service, Stewardship



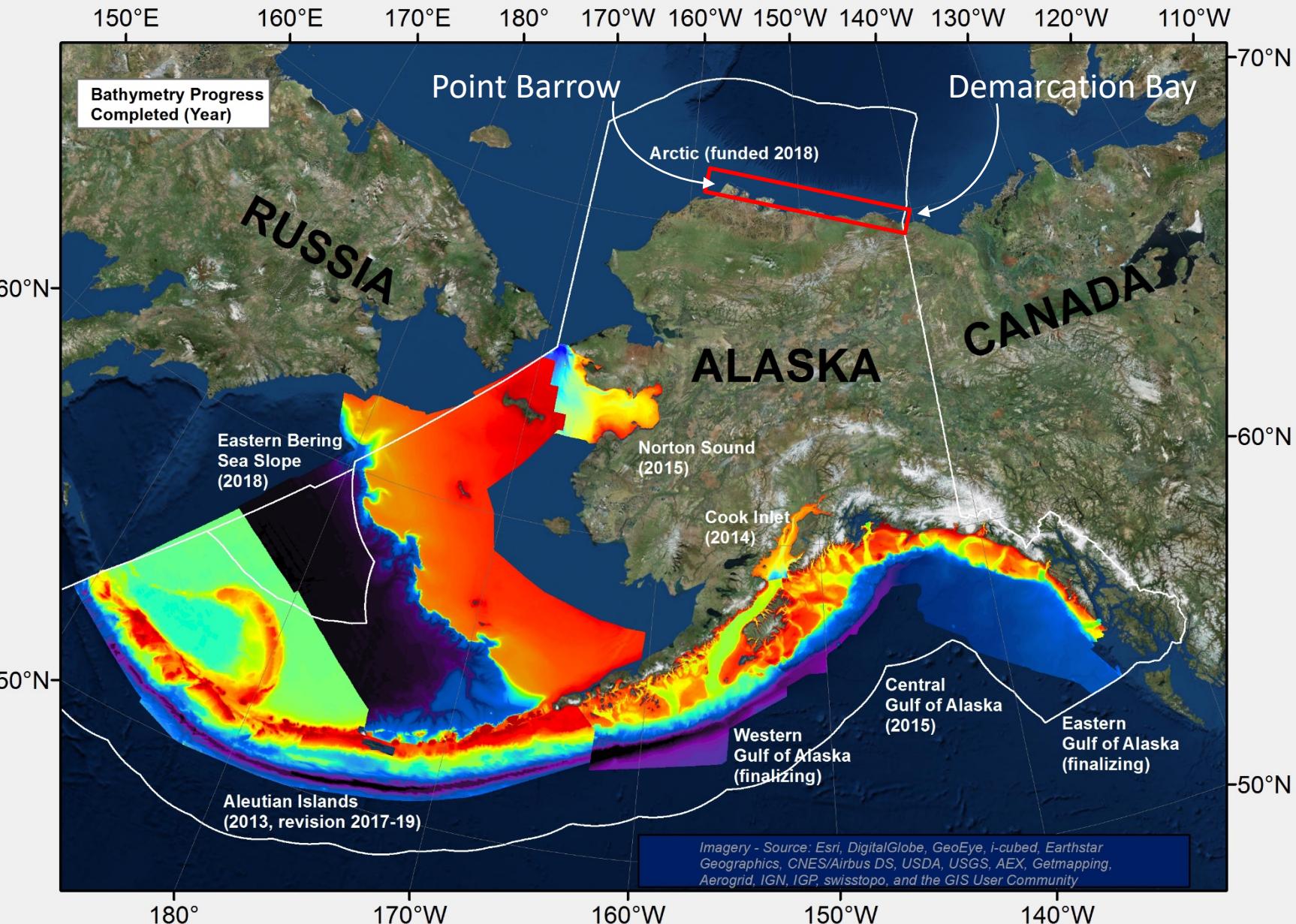
Nearshore Alaska Arctic bathymetry

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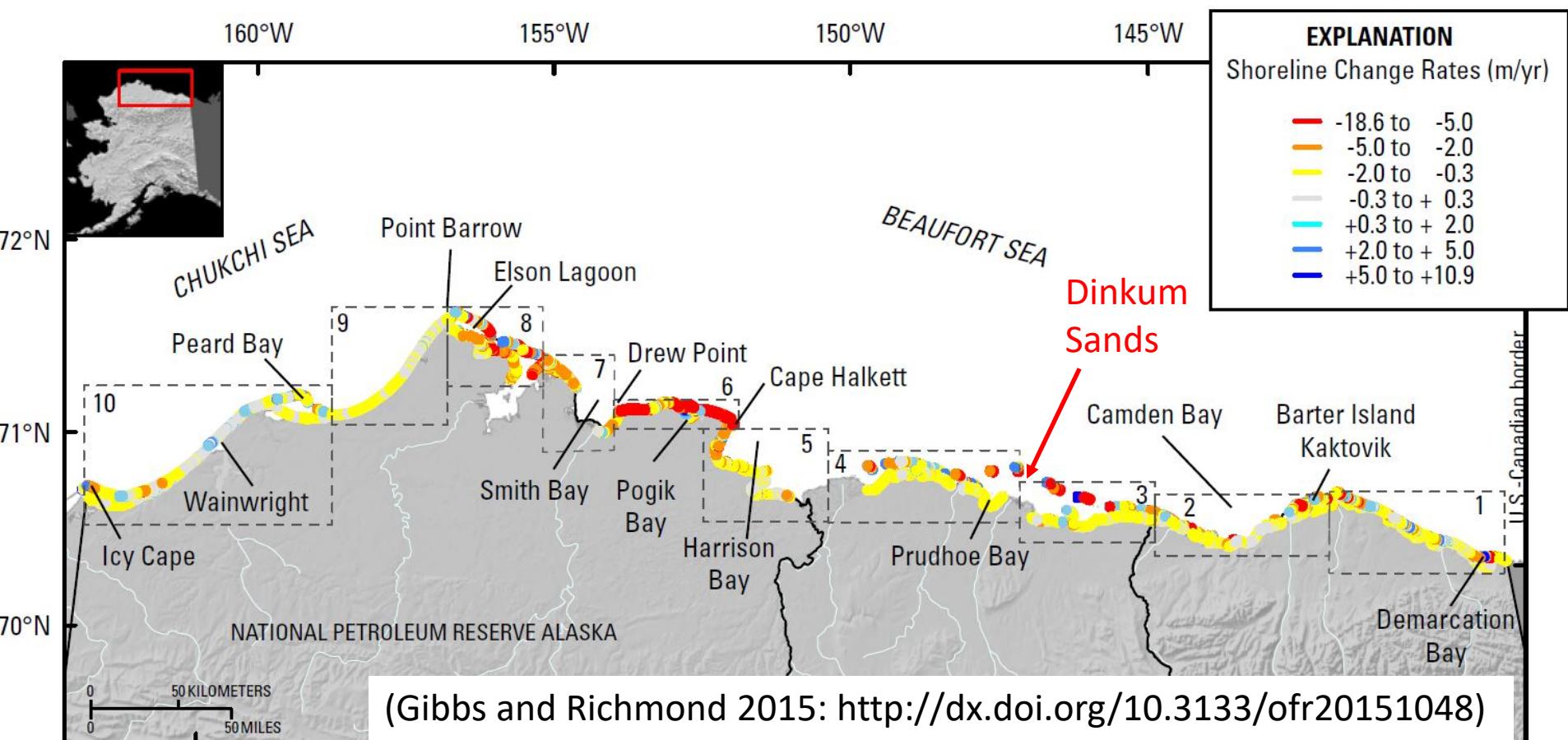


**NATIONAL
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<http://www.afsc.noaa.gov/RACE/groundfish/bathymetry/>

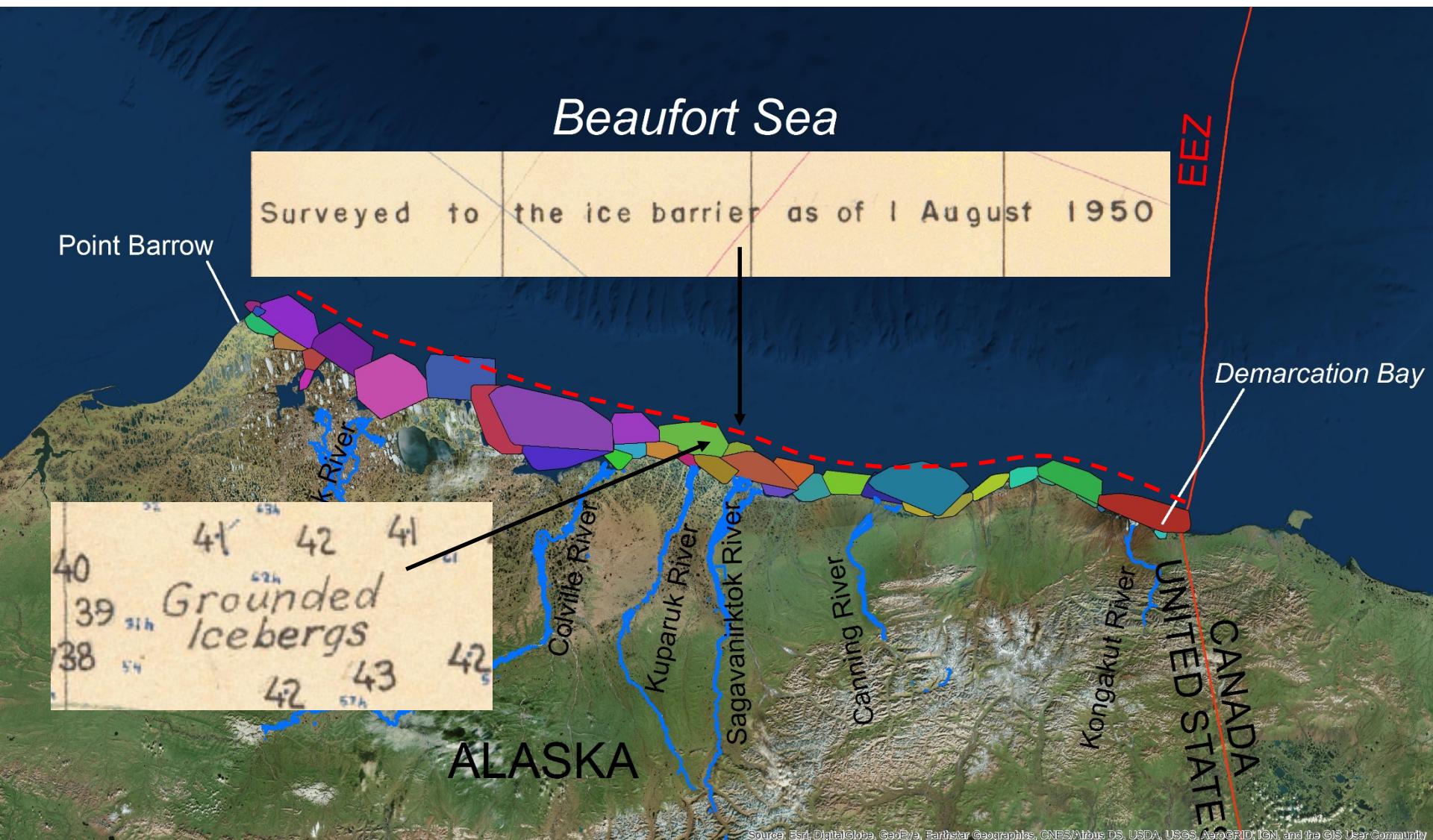


Significant Beaufort shore erosion (~1950 – 2000s)



Is the bathymetry changing too?

Areal extent of smooth sheet surveys



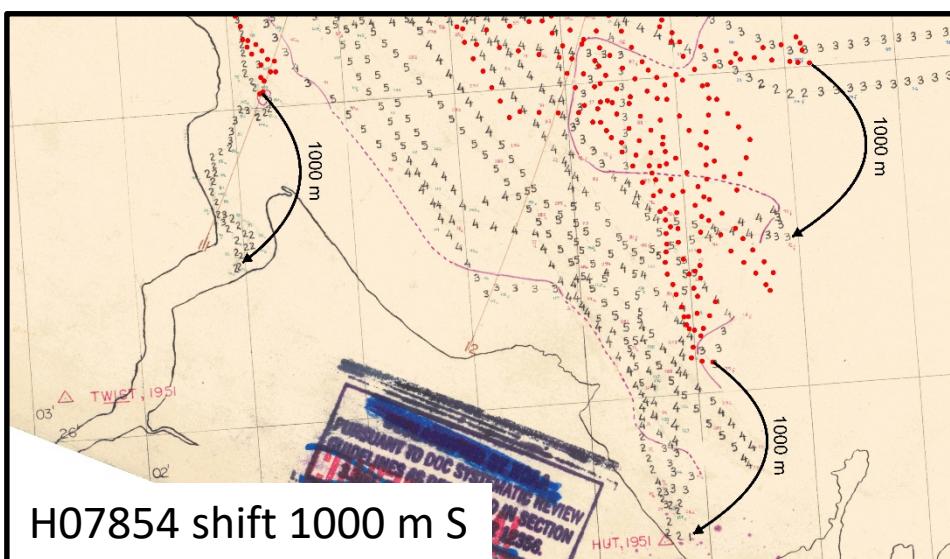
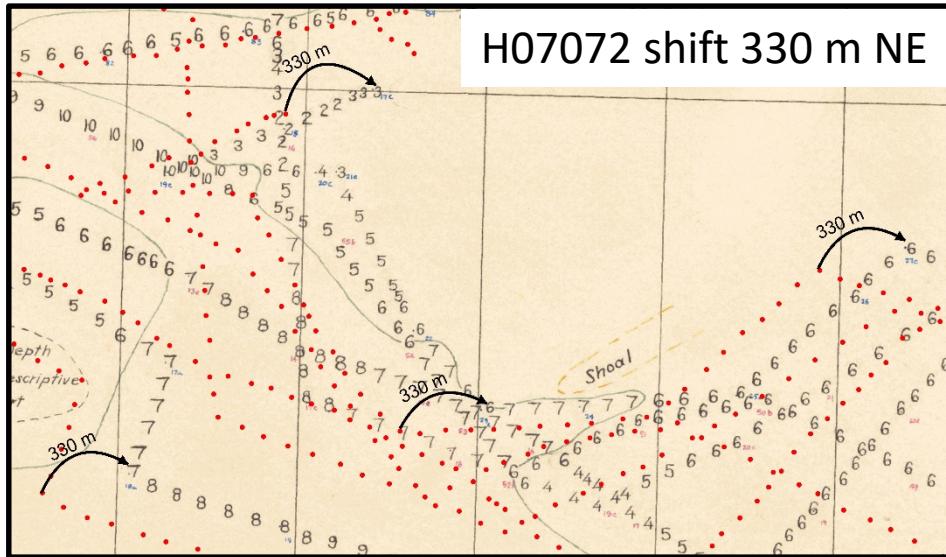
Bathymetry editing

2 needed digitizing

- F00109 (n=334 soundings)
- H07761 (n=8384 soundings)

38 needed editing

- Duplicate soundings
- Missing soundings
- Horizontal shifting

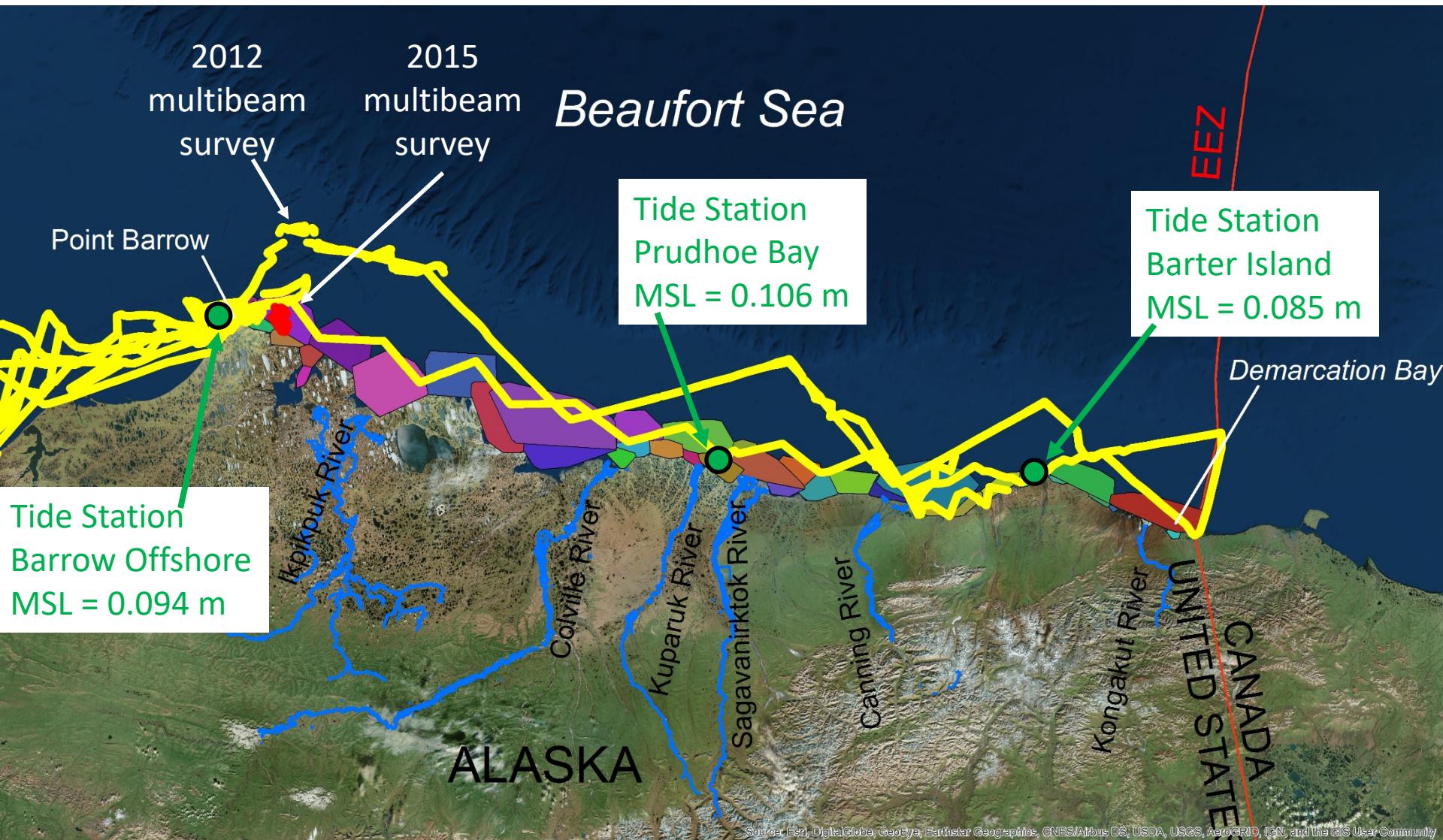


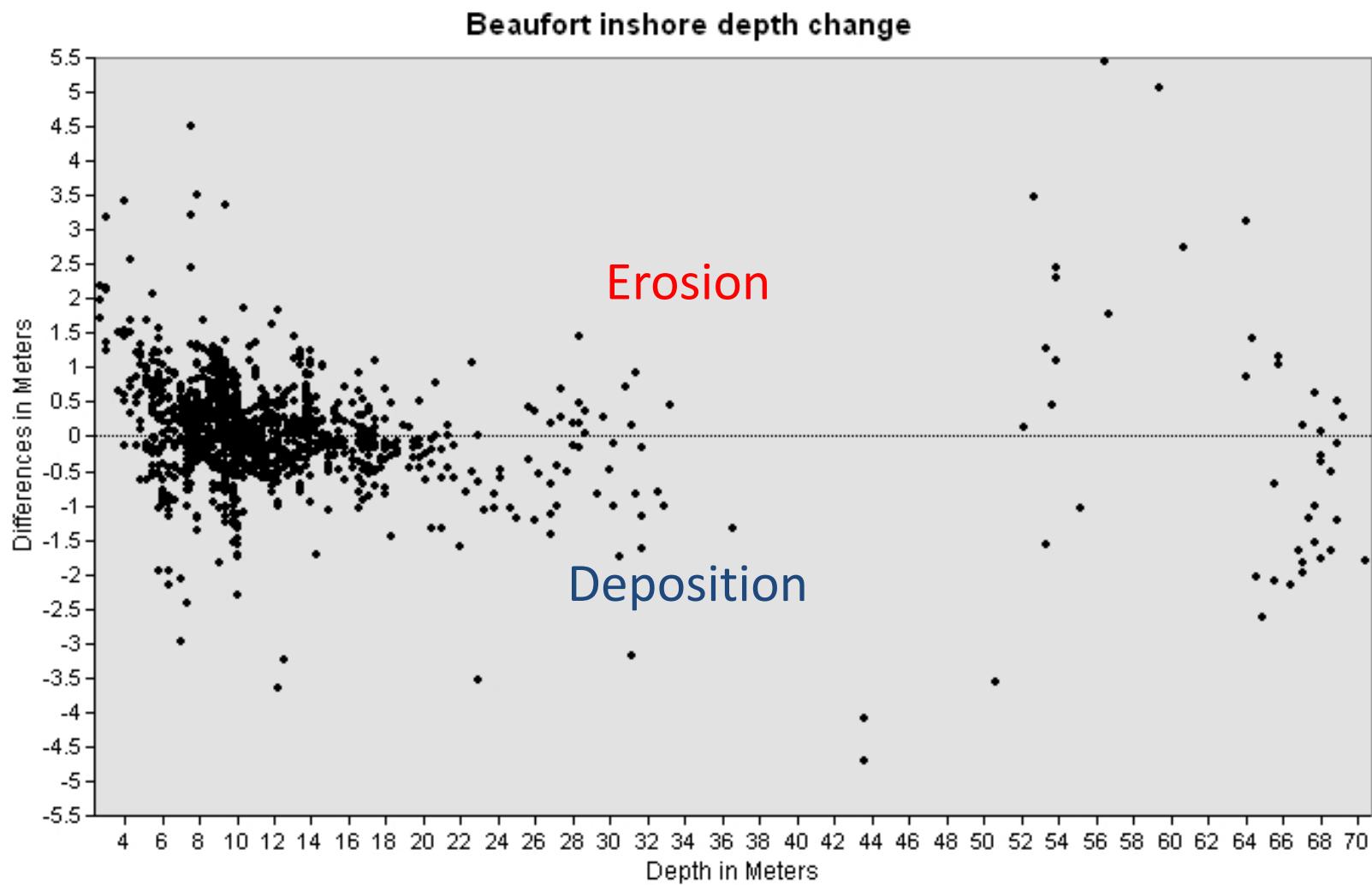
H07854 shift 1000 m S

Original Beaufort surveys

- Number: 40 smooth sheets, 0.25M soundings
- Years: 1945-1953
- Very shallow: <20 m
- Depth units: feet (0.305 m)
- Vertical datum: MLLW → **MSL**
- MHW = ~ 1 foot (0.305 m)
- Horizontal datums: → **NAD83** → **WGS84**
 - Barrow (1945),
 - Barter Island (1948), and
 - Flaxman Island or Leffingwell (1912).

Multibeam survey overlaps with smooth sheets



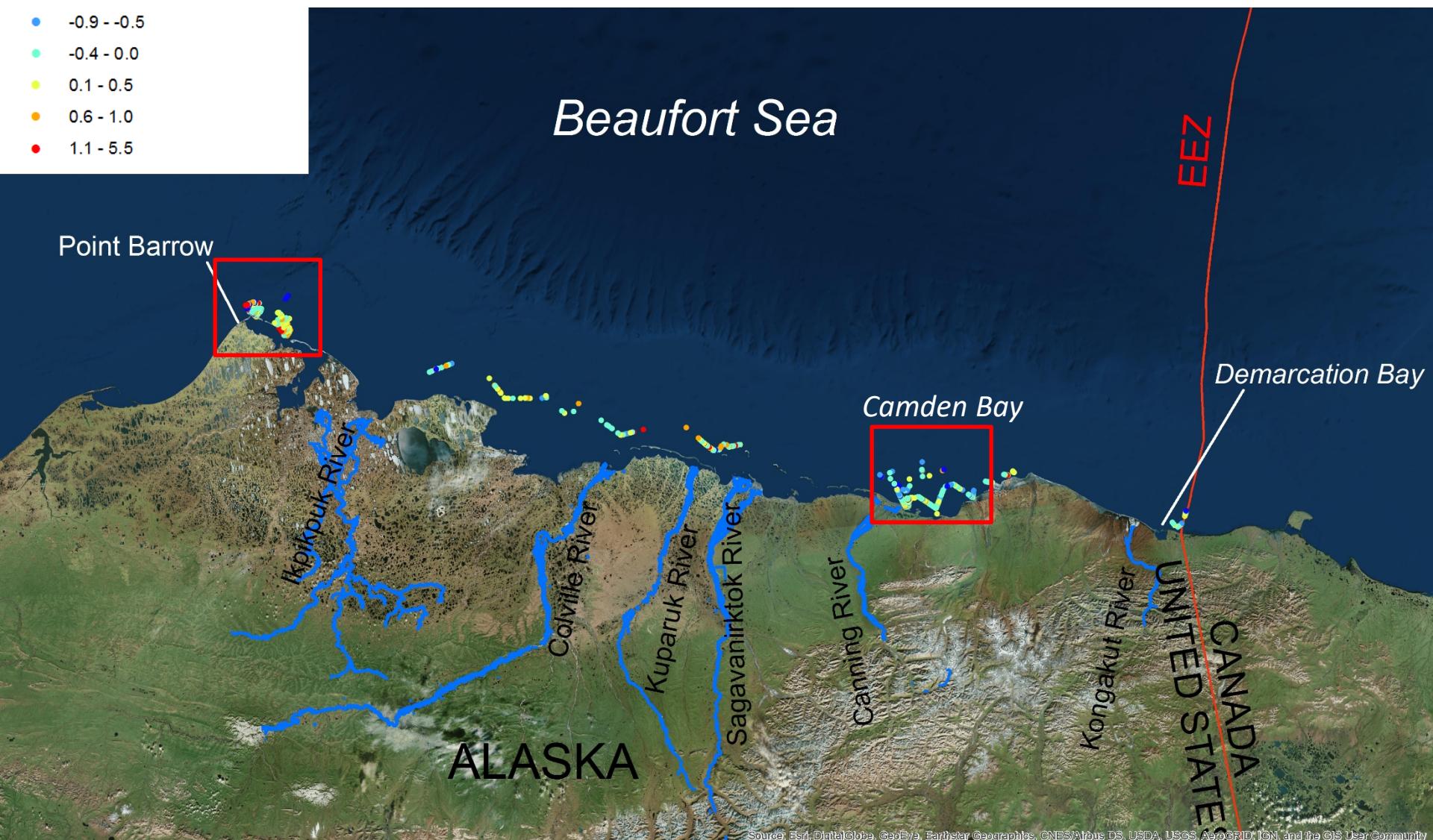


Legend

Depth differences (meters)

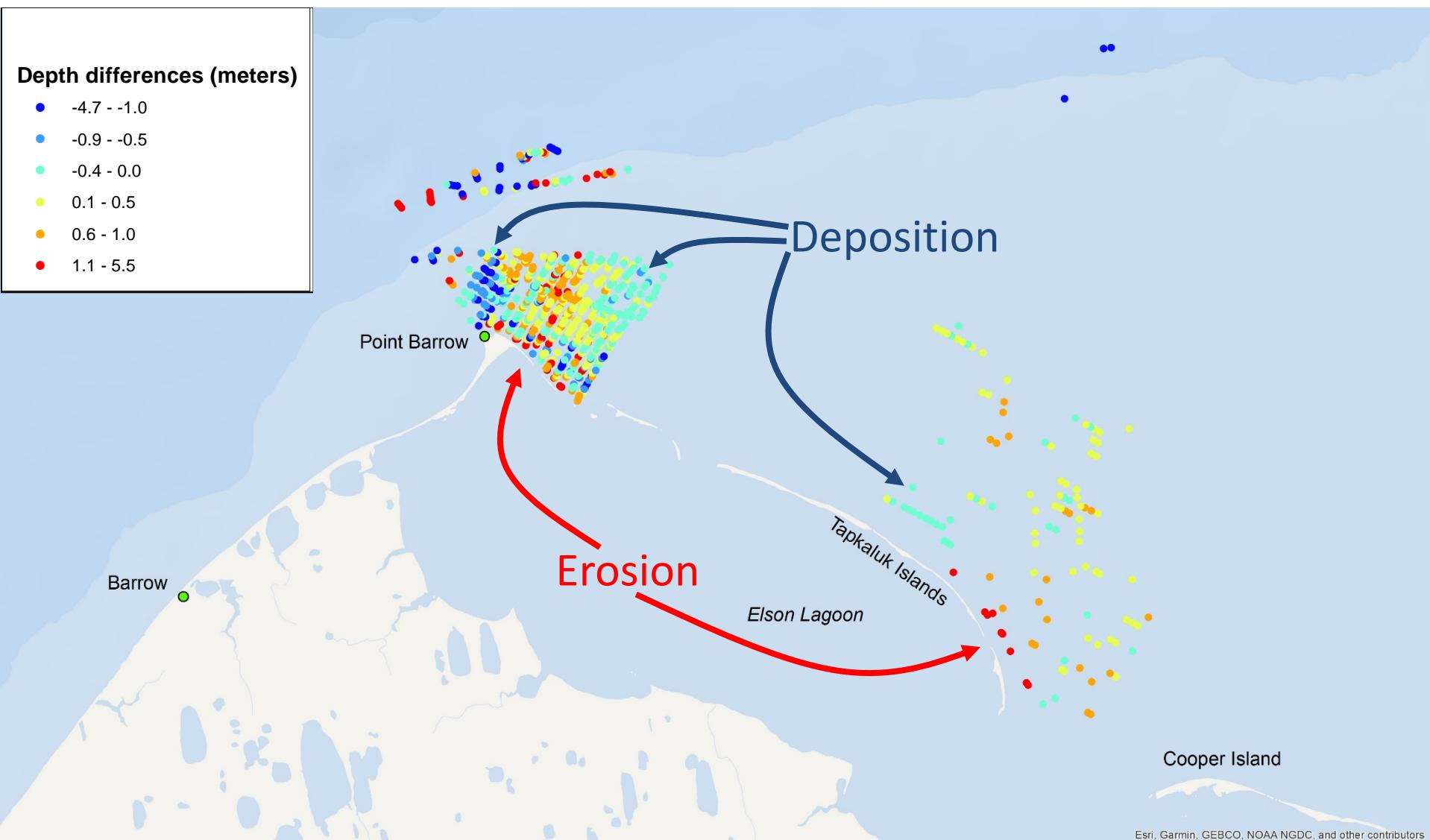
- 4.7 - -1.0
- 0.9 - -0.5
- 0.4 - 0.0
- 0.1 - 0.5
- 0.6 - 1.0
- 1.1 - 5.5

Spatial variation in depth differences

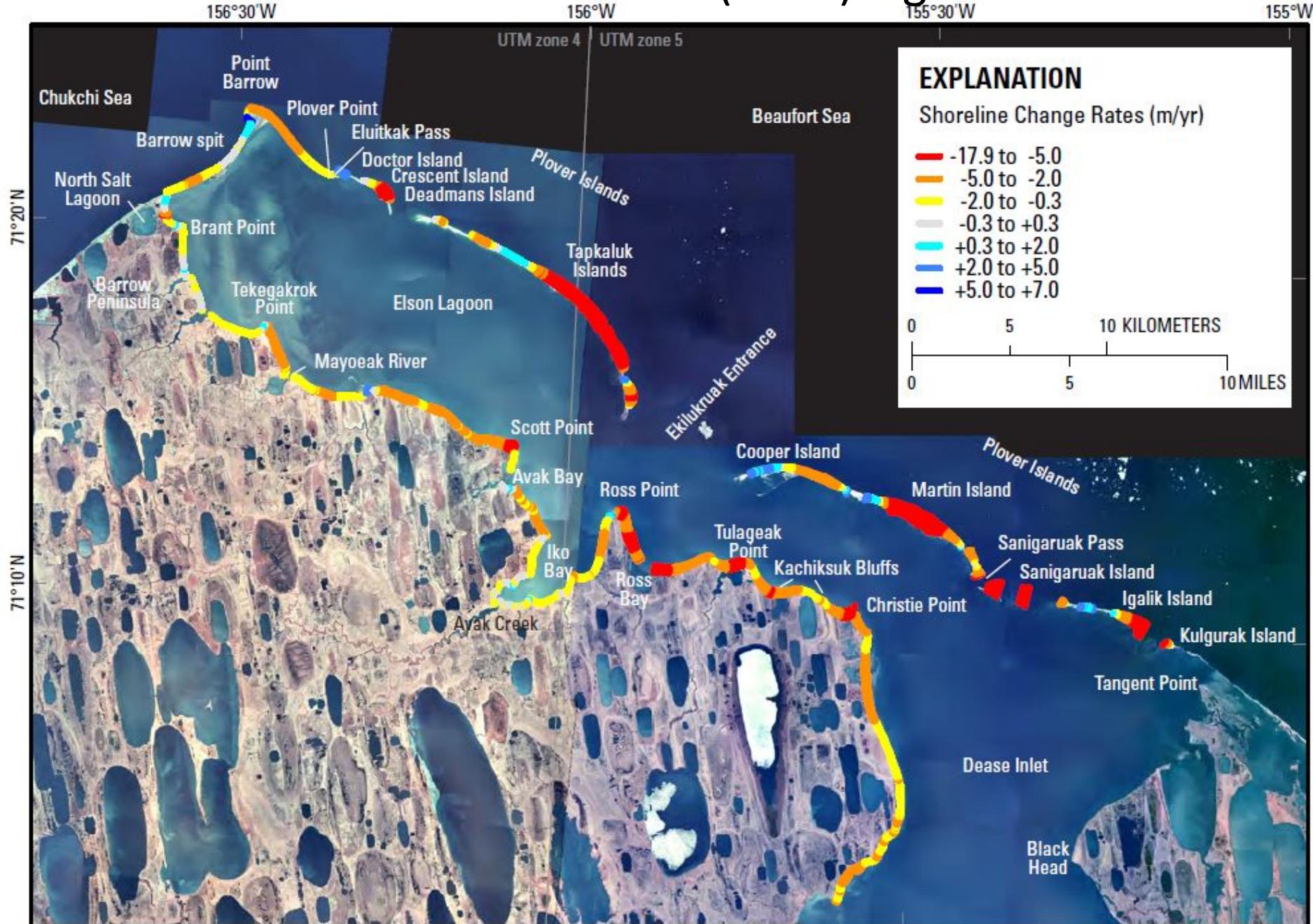


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

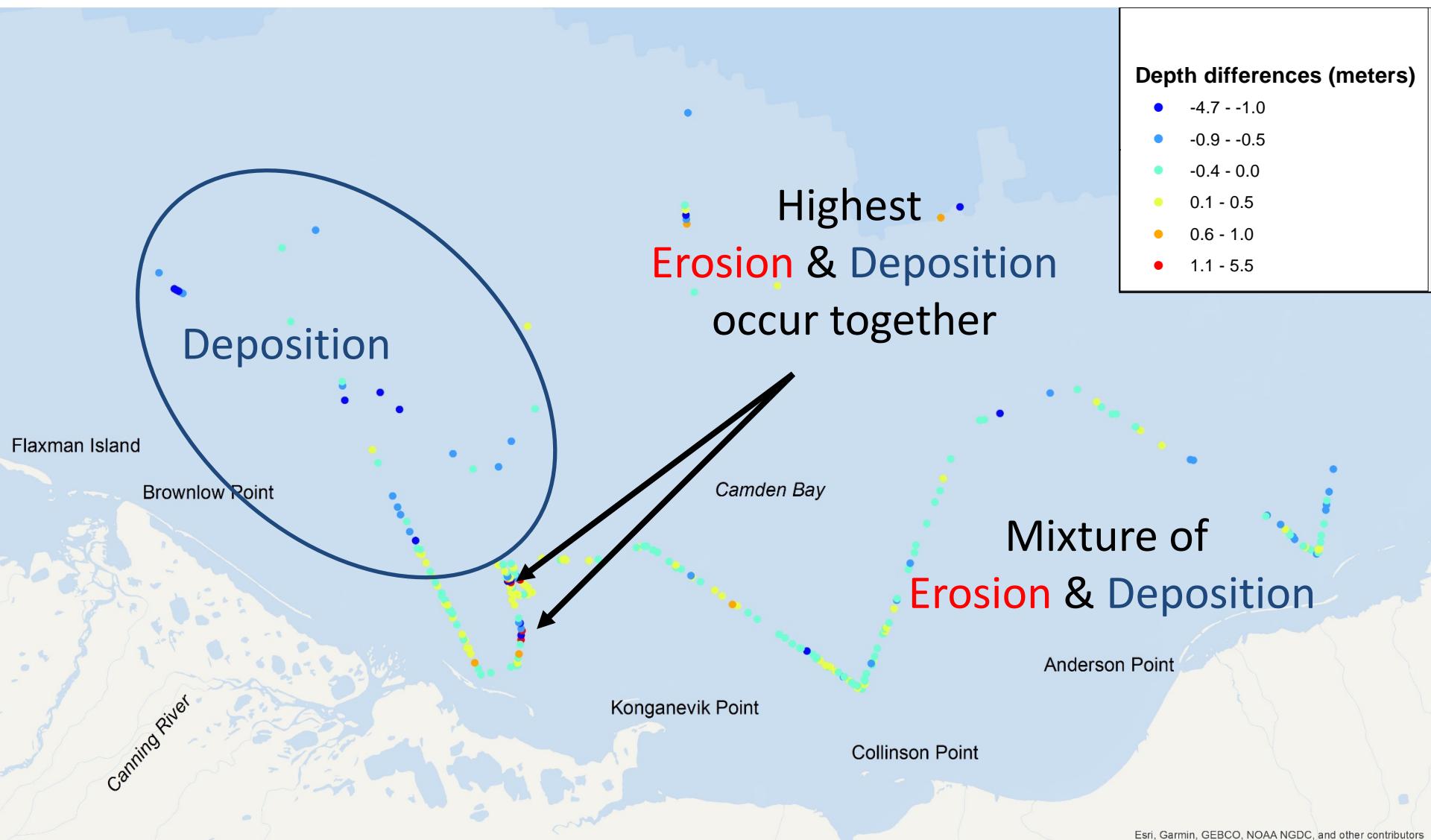
Point Barrow region depth differences



Gibbs and Richmond (2015) Figure 56



Camden Bay region depth differences



Gibbs and Richmond (2015) Figure 18

146°W

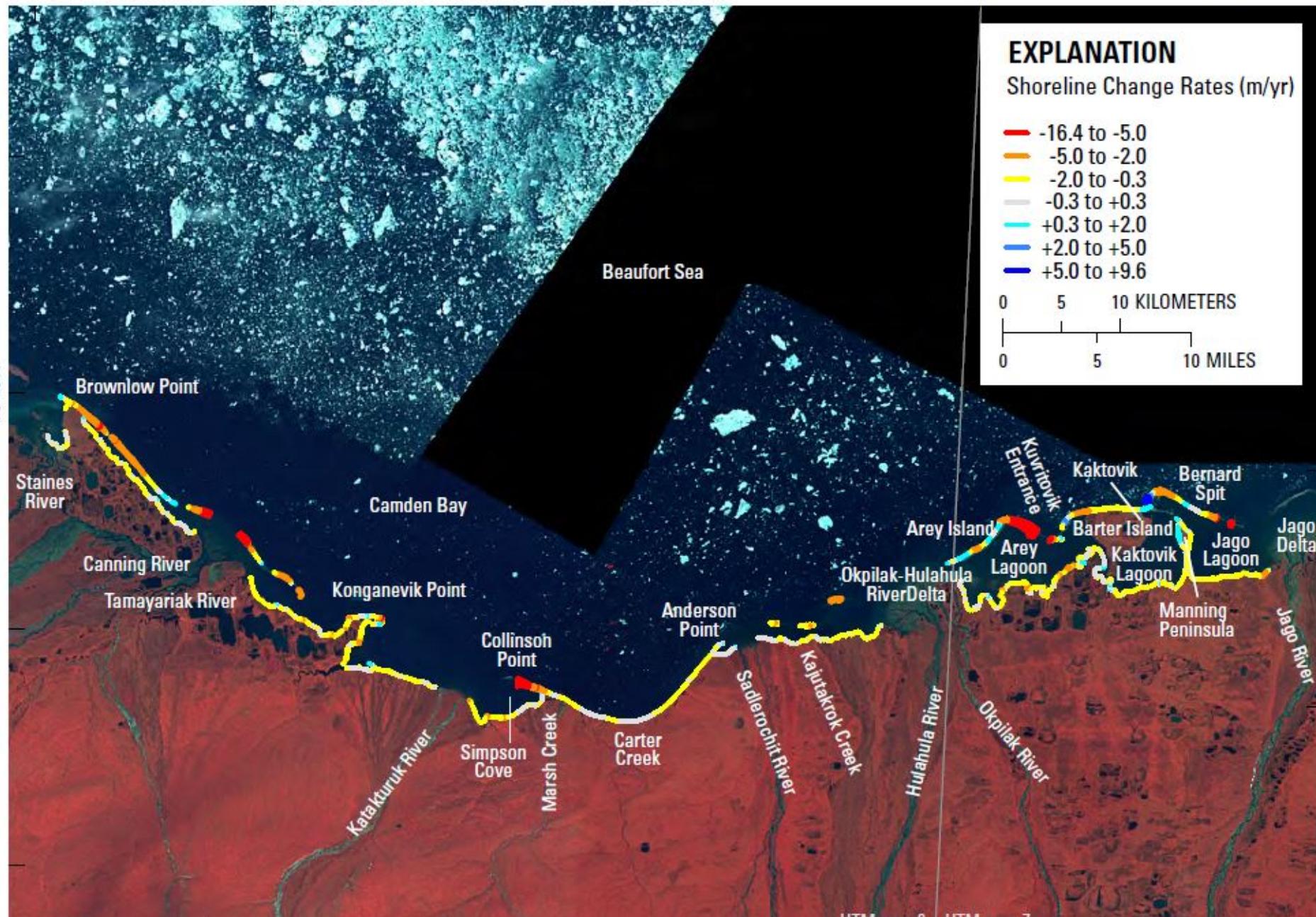
145°30'W

145°W

144°30'W

144°W

143°30'W



Conclusions

- Beaufort nearshore bathymetry has changed
- Some inshore erosion matches shore erosion
- Mostly a mix of erosion and deposition
- Strong spatial autocorrelation

