


Article

# Supplementary Material: First order estimates of coastal bathymetry in Ilulissat and Naajarsuit Fjords, Greenland, from remotely-sensed iceberg observations

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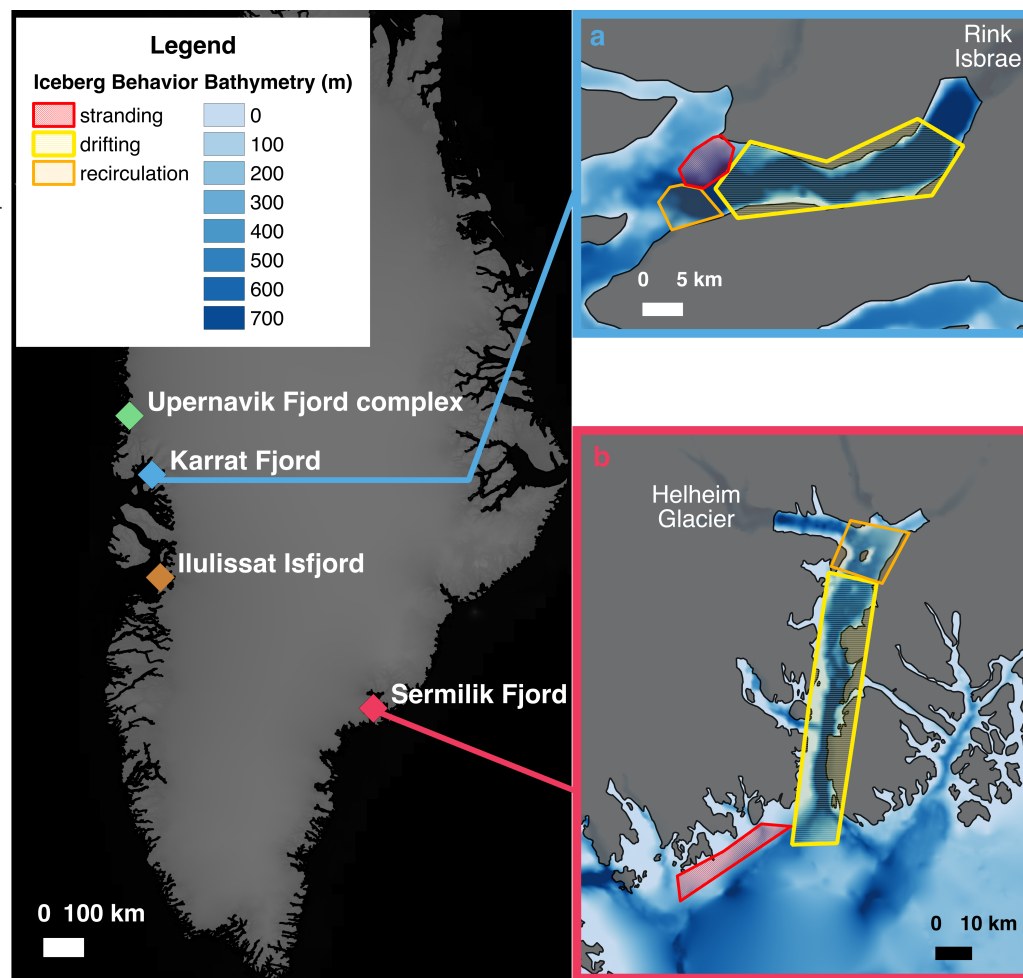
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## 1. Methods: Qualitative Bathymetry and Study Sites

Quantifying water depth in shallow regions requires the presence of deep-drafted icebergs in shallow water and sufficient stereo image pairs to construct DEMs of icebergs. Two regions analyzed for qualitative bathymetry were not well suited for quantifying bathymetry. However, the areas of iceberg drifting, stranding, and recirculation identified indicate that the manual method provides a robust means of inferring relative bathymetry and predicting the presence or absence of a large blocking feature (i.e. sill) (Figure S1). Two systems for which qualitative bathymetry was compiled were not candidates for quantitative analysis. These systems, and the reasons preventing quantification of bathymetry, are presented here. In the Karrat Fjord system of West Greenland we focused on the fjord into which Rink Isbræ terminates. Similar to the Upernavik/Naajarsuit system, Karrat contains several shallow areas/partial sills but no distinct blocking feature that spans the fjord [1]. Here, our analysis was limited by the lack of sufficient WorldView stereo image pairs to estimate water depths in shallow regions. In Sermilik Fjord, the only site in East Greenland, icebergs are calved primarily from Helheim Glacier and the fjord showed no regions of stranding (Figure S1), as corroborated by ship-based seafloor mapping [2].



**Figure 1.** Qualitative bathymetry overlaid on BedMachine v3 bathymetry [3] for two locations around Greenland. Areas of stranding (red) and drifting (yellow) identified by iceberg movement correspond to bathymetric highs (light blue) and lows (dark blue), respectively. Areas with no outlines were not searched. Land is shown in grey. Glaciers supplying the majority of the icebergs in each fjord are labeled, with the location of each system identified in the panel on the left.

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