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A six-year circum-Antarctic icebergs dataset (2018–2023)

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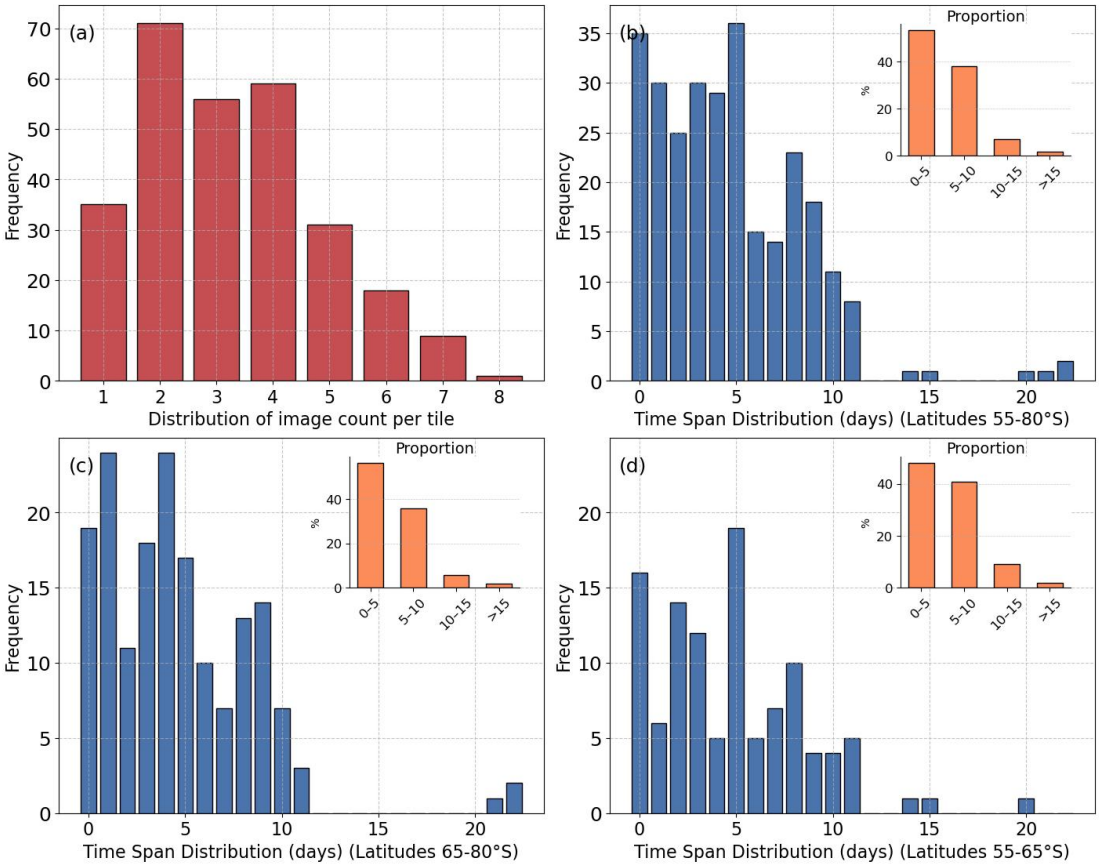

Figure S1. Panel (a) distribution of the number of Sentinel-1 images per tile. Panels (b-d) histograms of the time span between acquisition dates for tiles in different latitude bands (55°S-80°S, 55°S-65°S and 65°S-80°S).

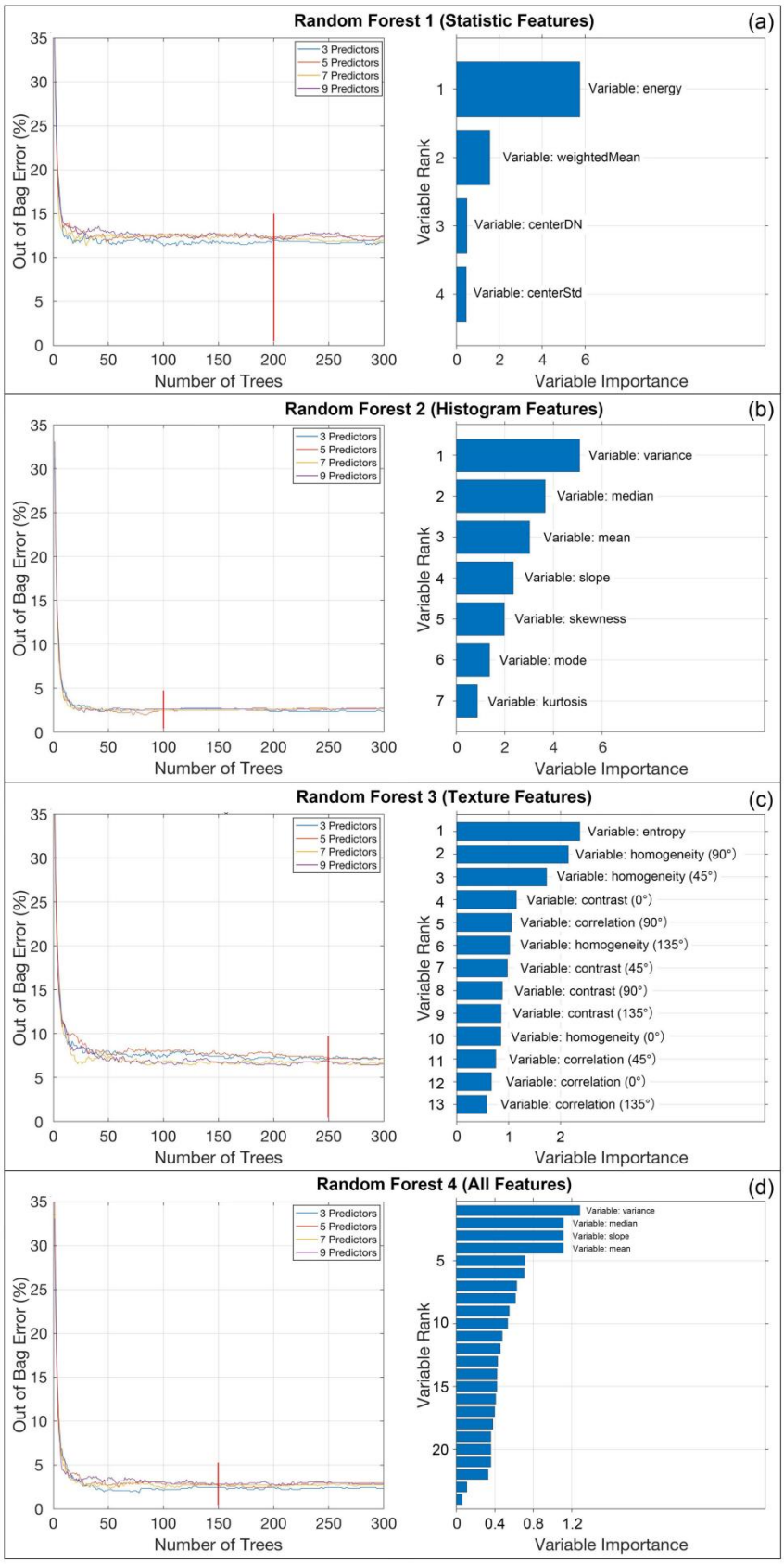

Figure S2. Out-of-bag error and parameter importance of random forest classifiers based on different feature sets.

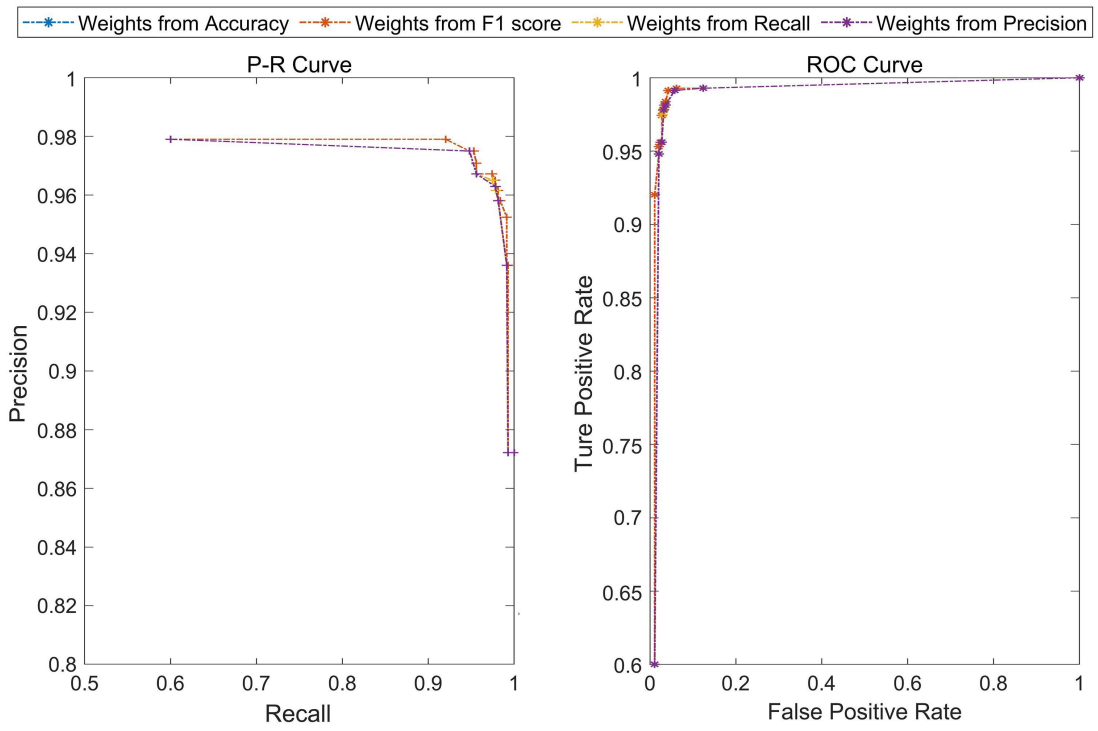

Figure S3. P-R and ROC curves of the incremental random forest classifiers.

Table S1. Optimal model parameters optimized independently for each year (2018-2023) for dataset production.

Year	Number of trees (RF1-RF4)	Weight (RF1-RF4)	Threshold
2018	200, 100, 250, 150	0.218, 0.271, 0.246, 0.265	0.783
2019	100, 100, 200, 100	0.230, 0.263, 0.244, 0.263	0.756
2020	300, 200, 200, 100	0.232, 0.259, 0.247, 0.262	0.739
2021	250, 200, 200, 200	0.210, 0.276, 0.238, 0.276	0.724
2022	250, 150, 100, 200	0.213, 0.274, 0.236, 0.277	0.726
2023	150, 150, 100, 200	0.214, 0.269, 0.247, 0.270	0.731

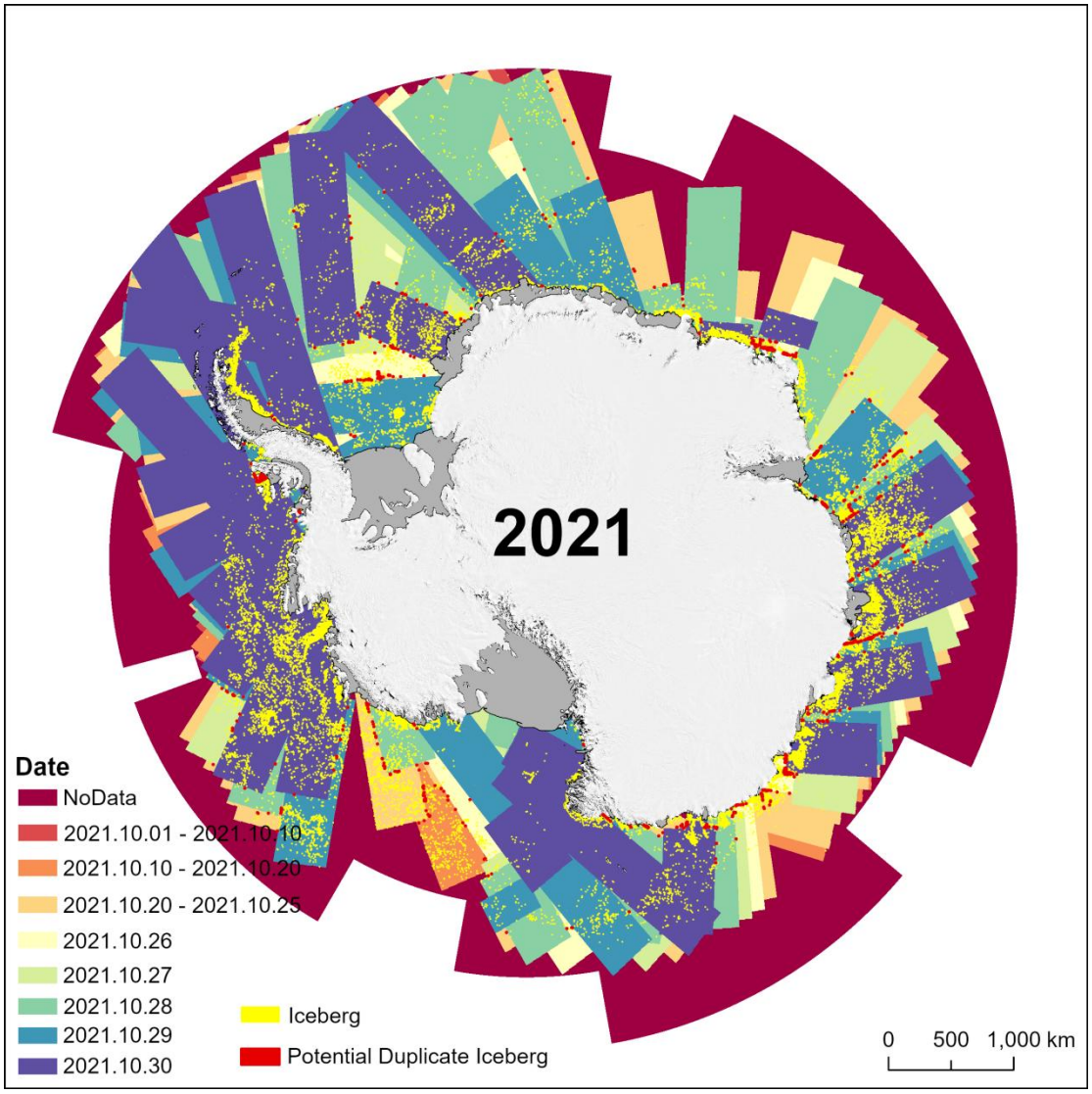

Figure S4. Spatial distribution of detected icebergs and potential duplicates around Antarctica in October 2021. Colors indicate the acquisition dates of Sentinel-1 EW scenes used to construct the monthly mosaic, while yellow and red points mark iceberg detections and potential duplicate icebergs, respectively.

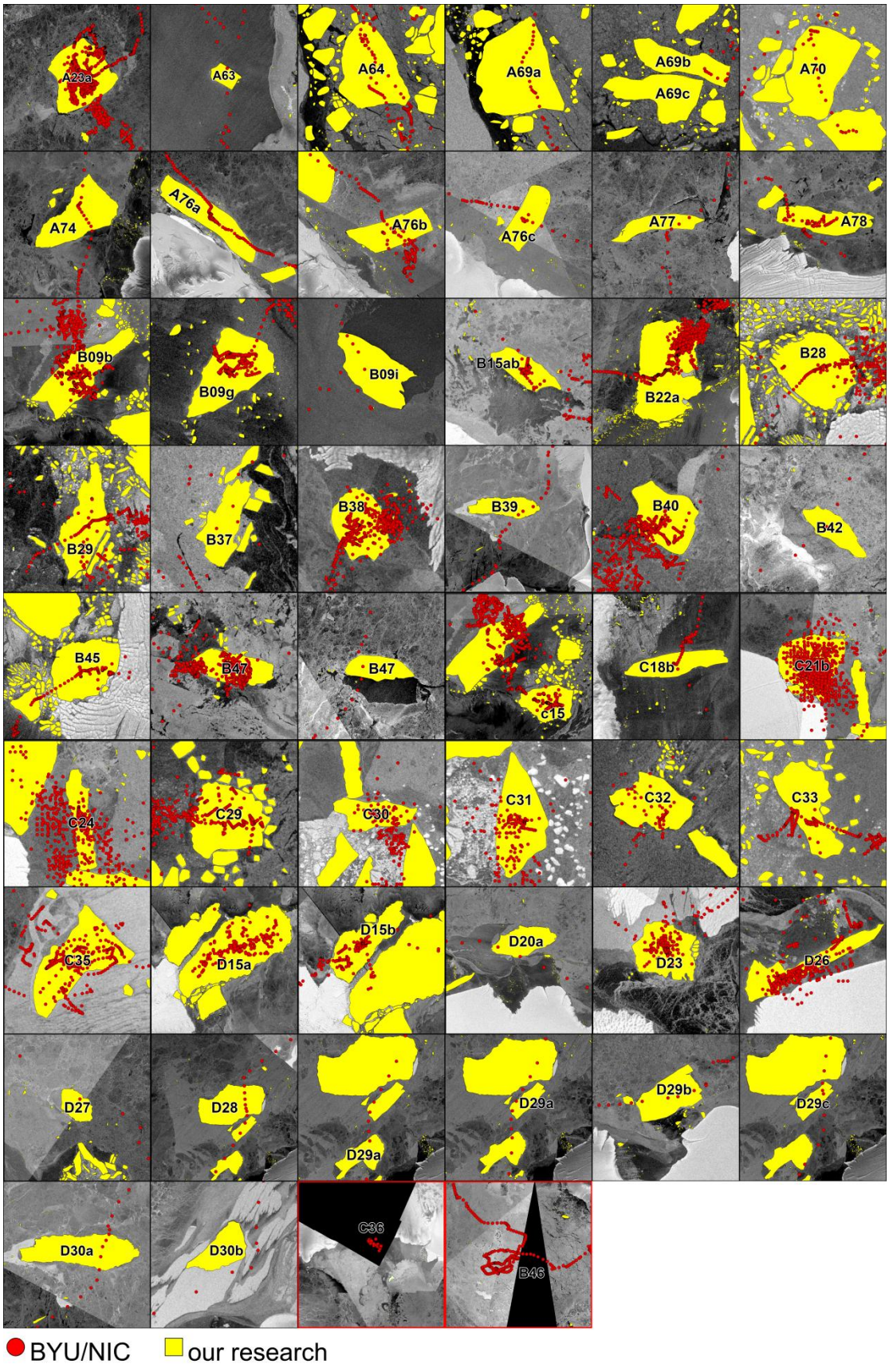

Figure S5. Comparison between iceberg trajectories recorded by

BYU/NIC in October 2021 and the spatial distribution from our database. Yellow polygons represent iceberg outlines identified in this study, while red dots mark iceberg positions reported by BYU/NIC, with labels corresponding to the official naming by the U.S. National Ice Center (NIC). Icebergs missed by our detection are highlighted with red frames.

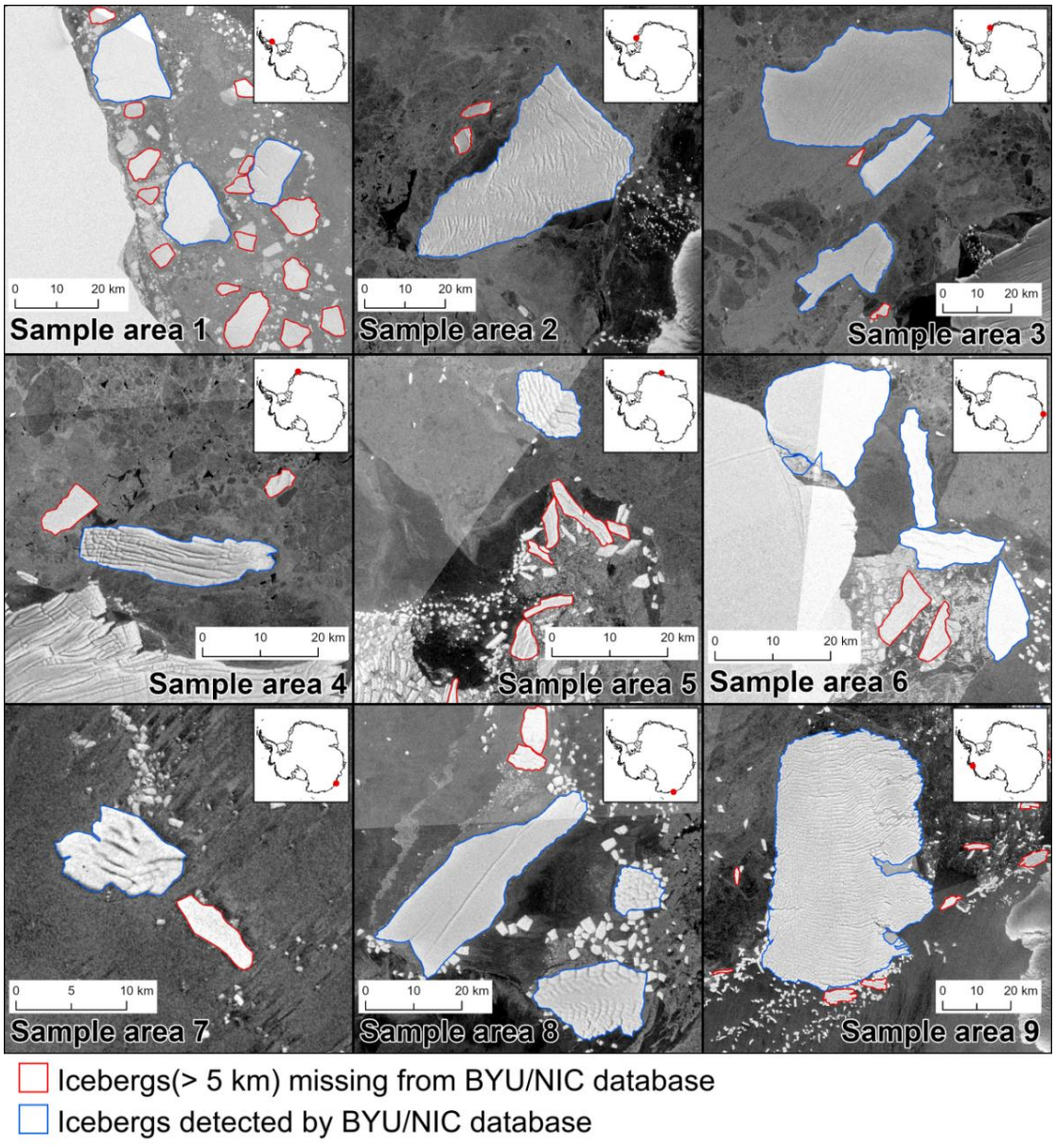

Figure S6. Examples of iceberg detections in nine representative sample areas. Blue outlines mark icebergs detected by the BYU/NIC database, while red outlines highlight icebergs with a major axis greater

than 5 km that are missing from the BYU/NIC database but identified in this study. Insets show the geographic location of each sample area around Antarctica.

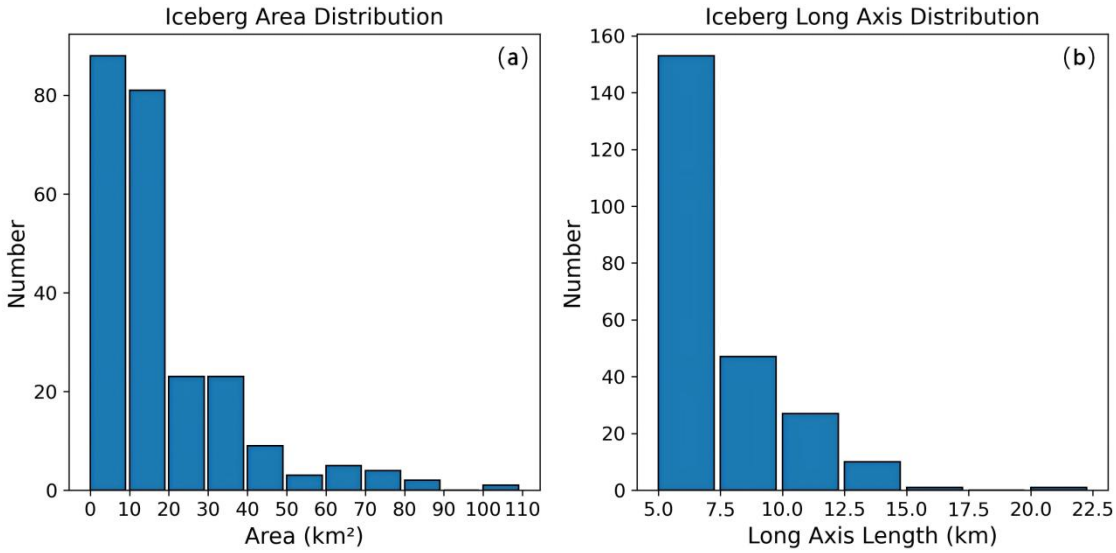

Figure S7. Histograms of geometric properties of icebergs missed by the BYU/NIC database: (a) iceberg area and (b) iceberg long-axis length.