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Supplement of

Thwaites Glacier thins and retreats fastest where ice-shelf channels intersect its grounding zone

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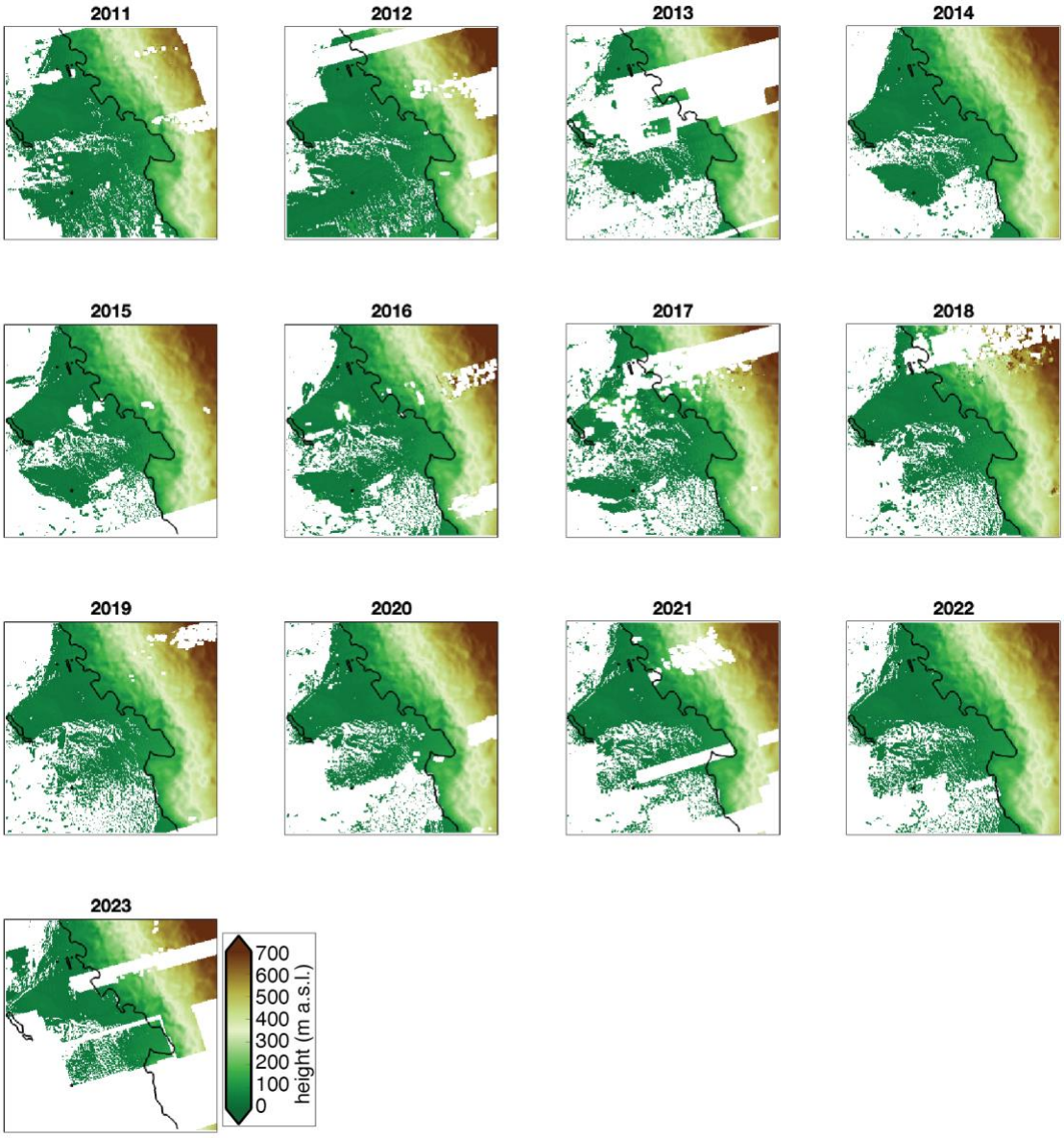

Figure S1: Annual Mosaic Coverage.

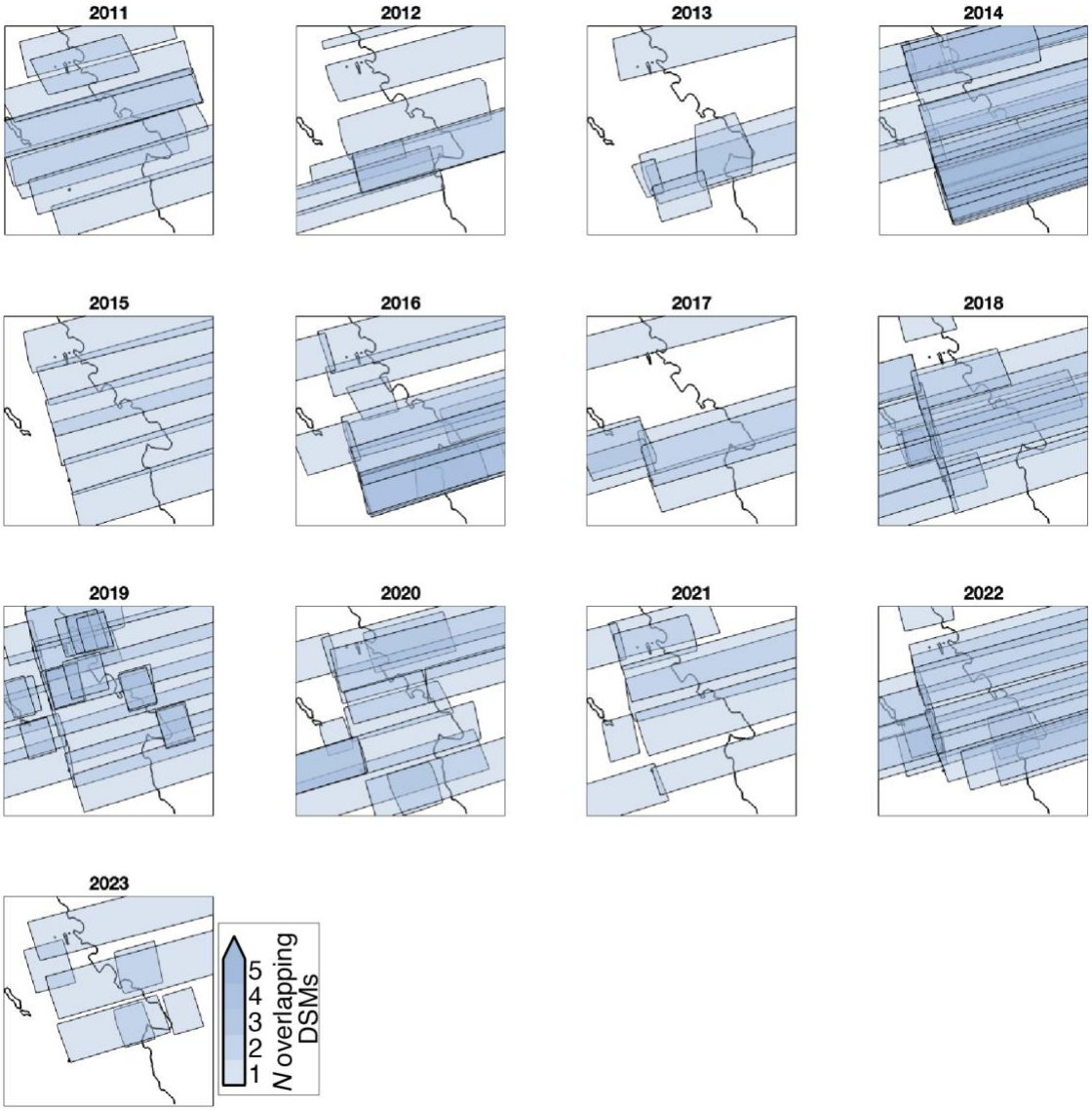

Figure S2: Annual coverage for Thwaites Glacier and the TGIS, showing strips that were registered and used to locate HB and surface depressions/basal channels.

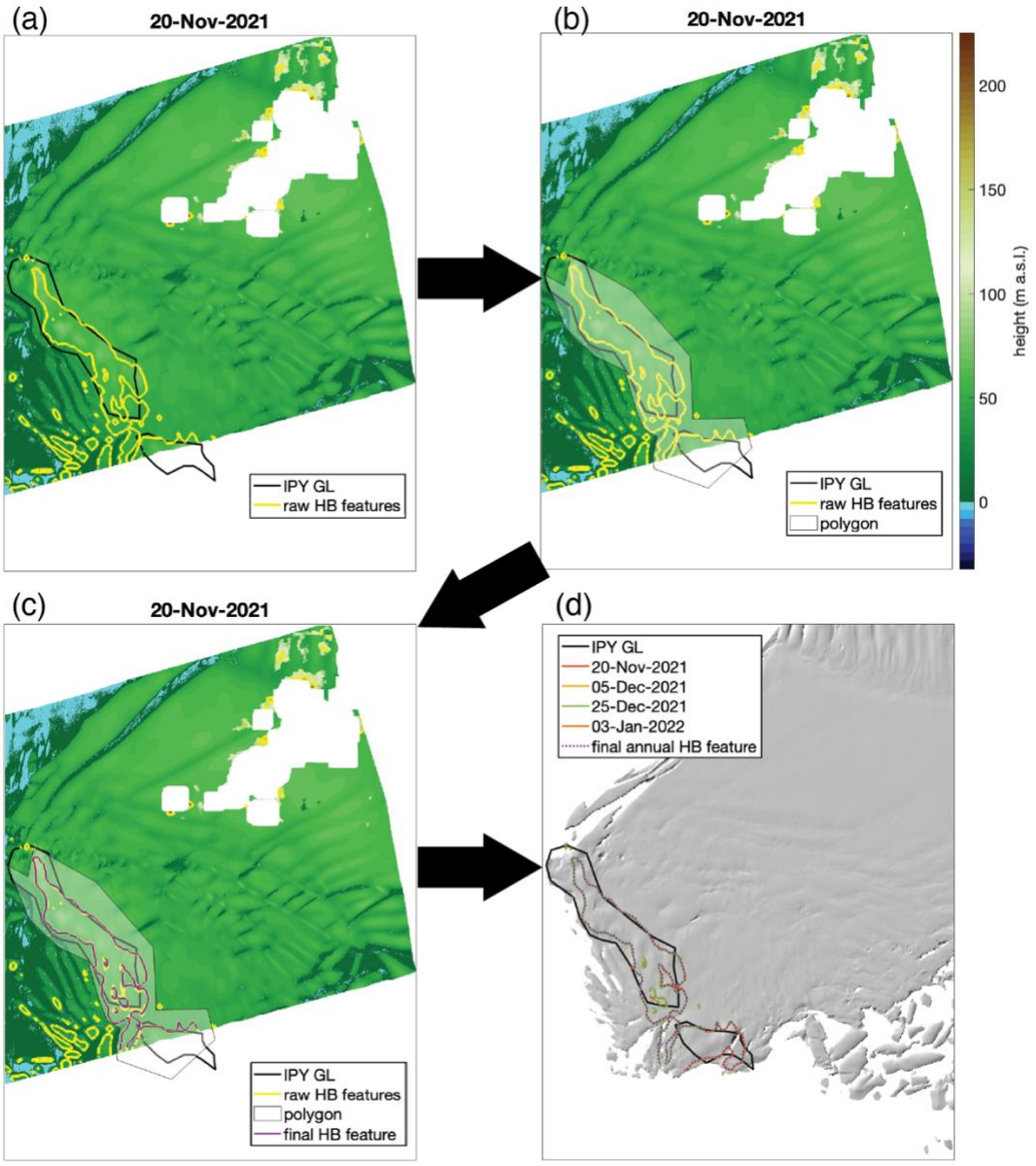

Figure S3: Workflow for manually delineating HB features (Section 3.1). (a) Step 1: plot all HB features automatically detected in the strip (yellow curve). (b) Step 2: manually draw a polygon around the features within the region of interest (here, Pinning Points 4 and 5 as seen in the IPY GL (black curve)). (c) Eliminate features outside the polygon and any with fewer than 25 points to obtain a final HB feature for that strip (purple curve). (d) Step 4: plot all HB features from each year (colored curves) and manually delineate the most consistent, continuous HB (purple dashed curve) from the combination of all HBs from that year.

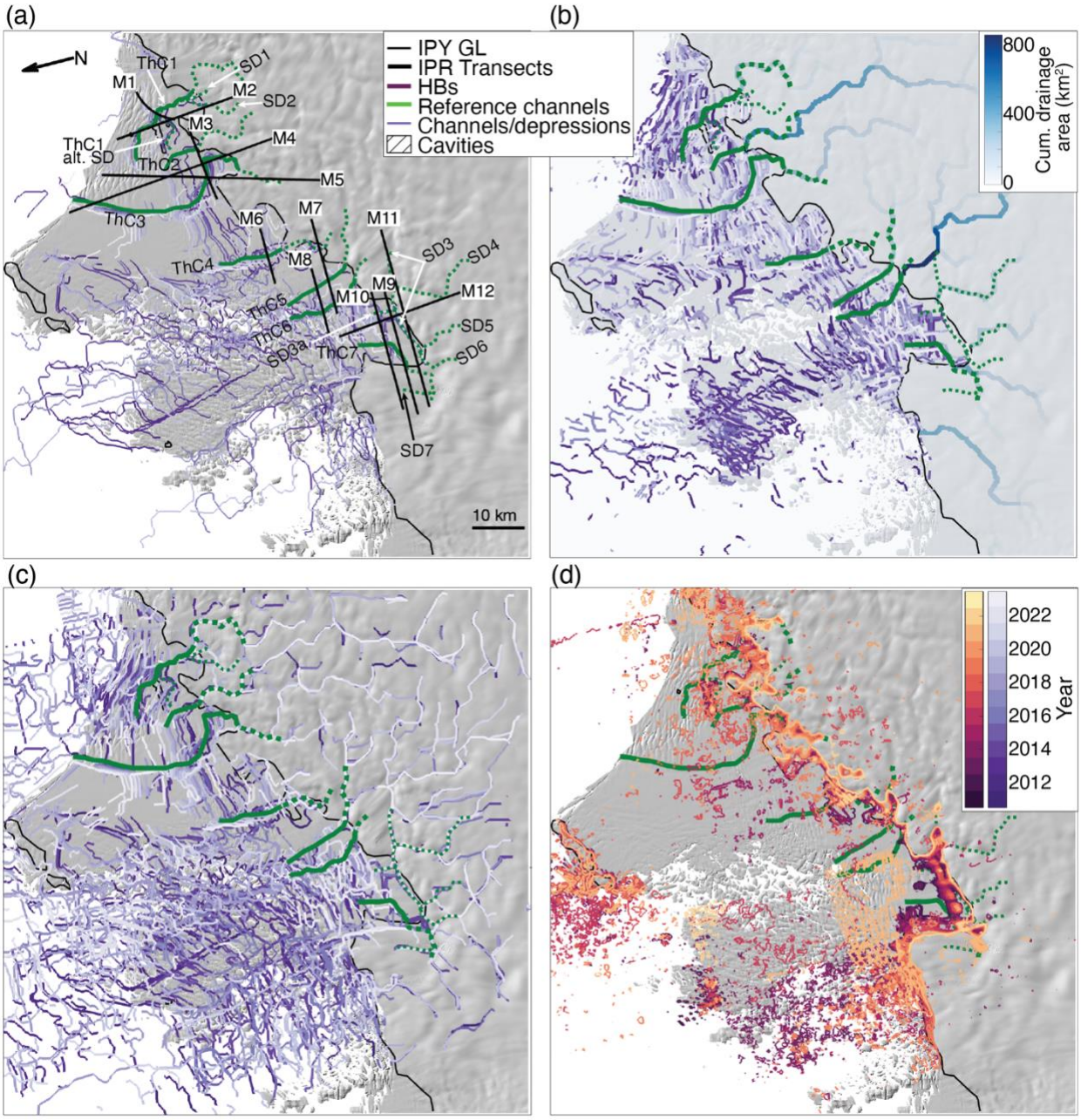

Figure S4: Strip-derived instances of surface depressions (a, b) and basal channels (c). (a) shows filtered surface depressions and the locations of OIB transects M1–M12 along which MCoRDS radar measurements were used to verify the presence of basal channels (Fig. S4). (b) and (c) show unfiltered instances of surface depressions and basal channels, respectively, and (d) shows unfiltered instances of the HBs.

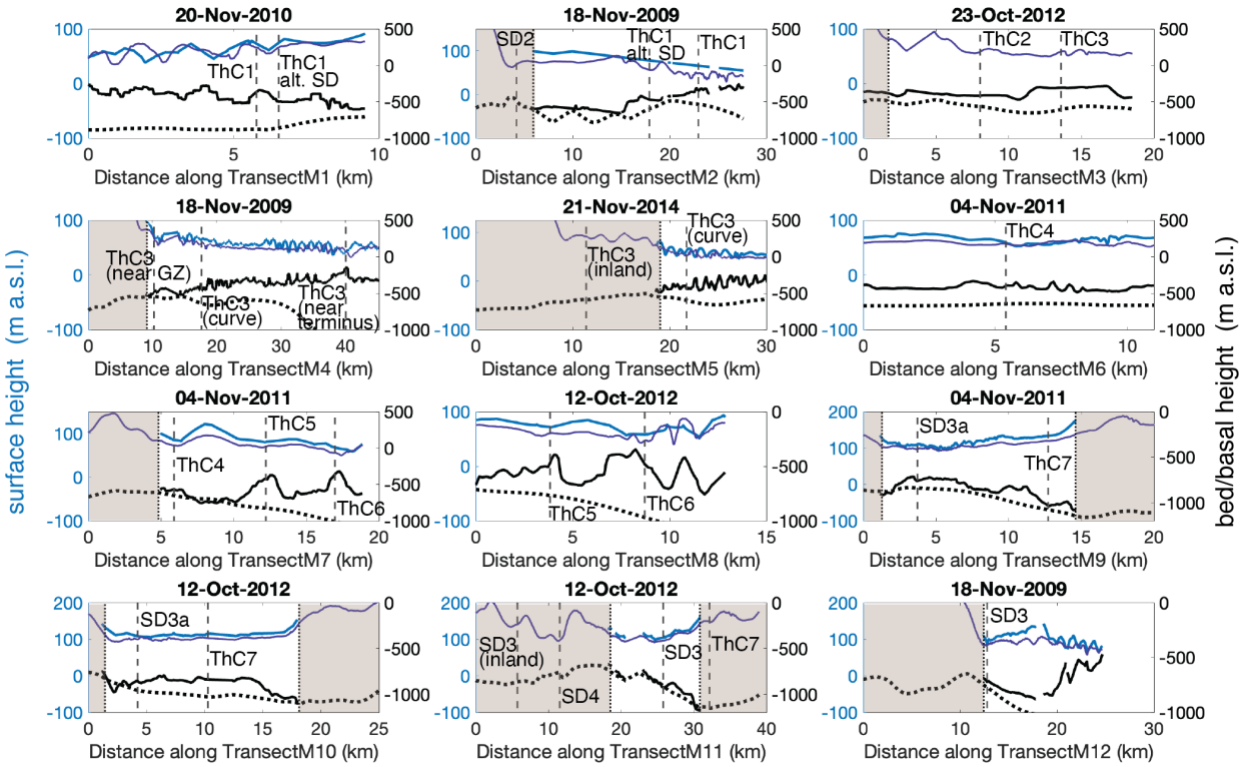

Figure S5: Selected IceBridge transects intersecting basal channels, showing ATM ice surface height (blue), REMA 200m mosaic surface height (purple), ice basal height (solid black; equal to ATM surface height minus MCoRDS thickness), and BedMachine bed height (dashed black). The start of each transect is labeled on Fig. S3a. Tan shaded areas indicate grounded regions inland of the 07-09 IPY GL.

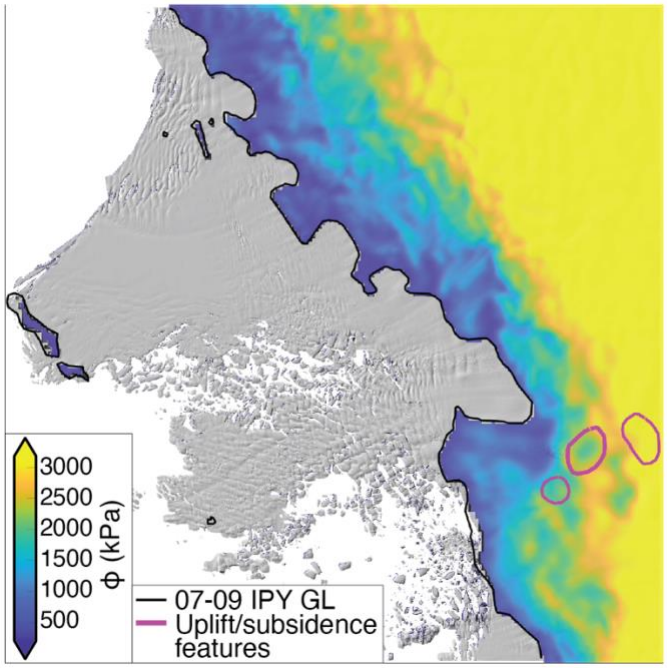

Figure S6: Grounded ice shows subglacial hydraulic potential; floating ice shows hillshade. Thick pink lines show the locations of uplift/subsidence features identified in Rignot et al., 2024.

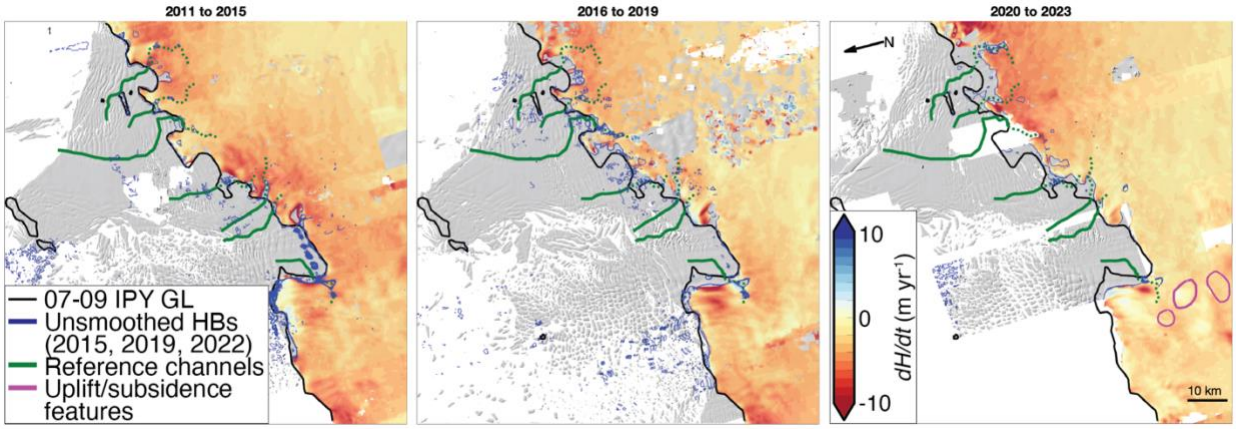

Figure S7: d*H*/d*t* on grounded ice. Thick pink lines in the rightmost panel show the locations of uplift/subsidence features identified in Rignot et al., 2024.

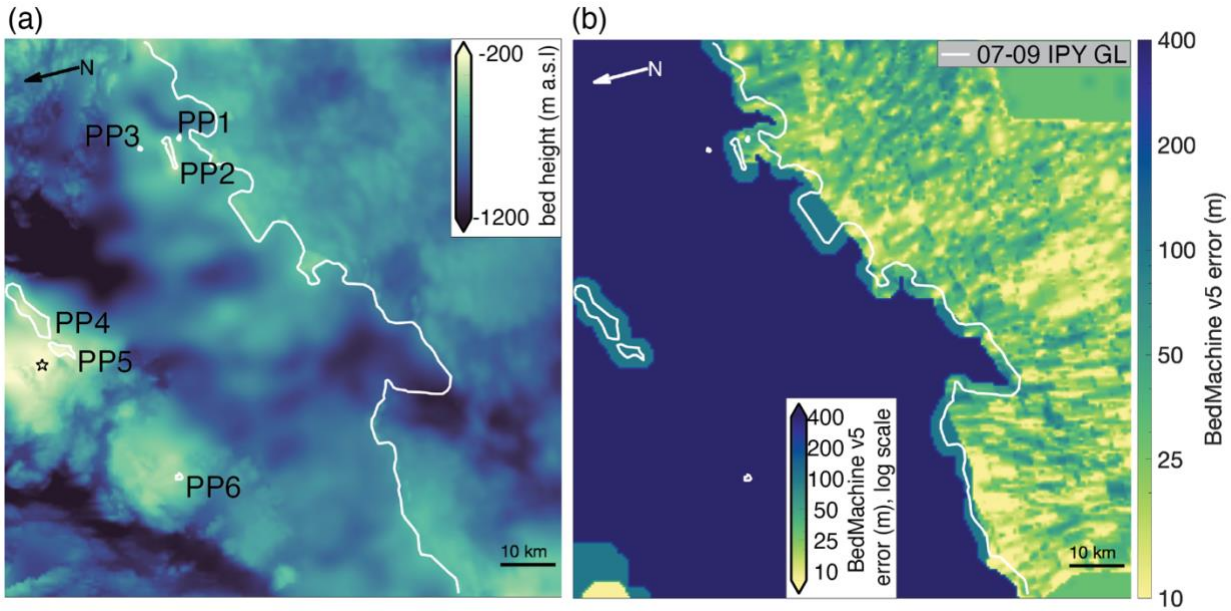

Figure S8: BedMachine v3 bed height (scale increases linearly) and error (scale increases logarithmically).

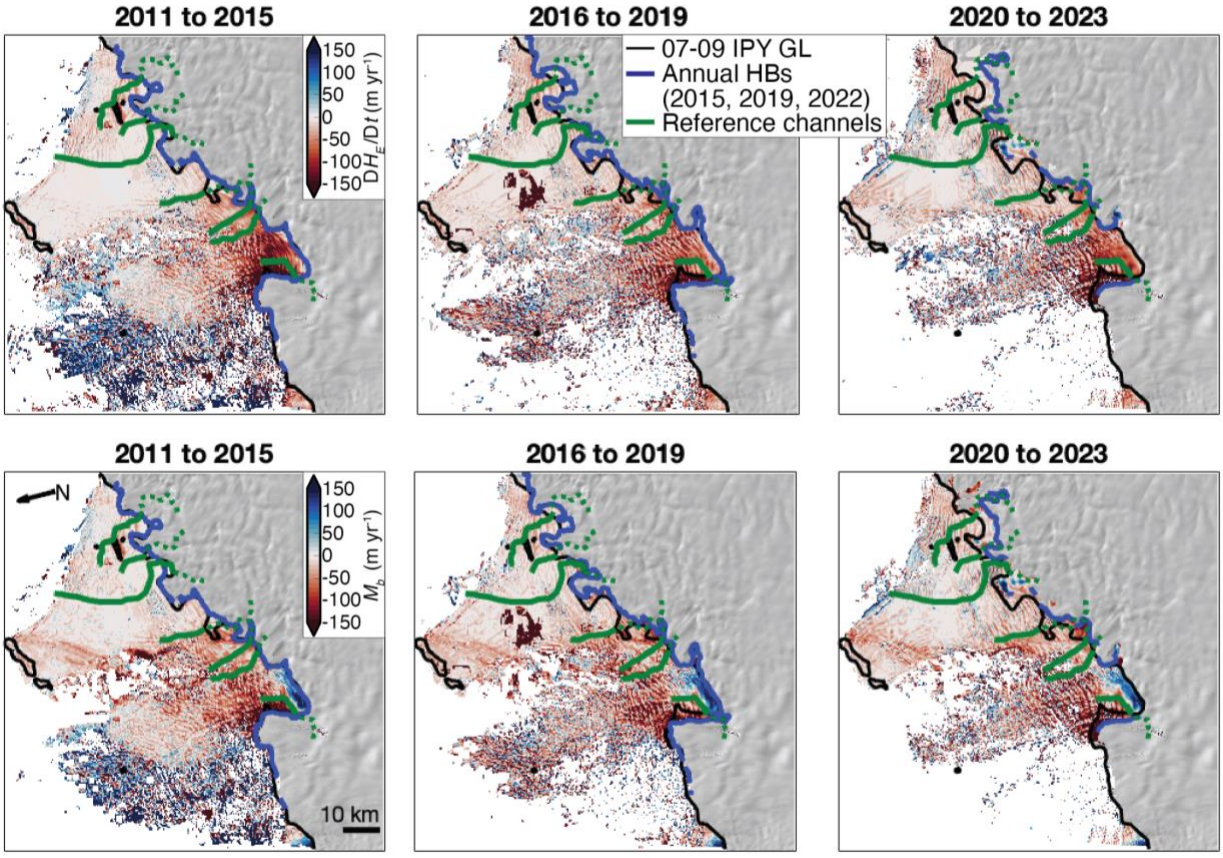

Figure S9: Lagrangian change maps flow-shifted with velocity mosaic instead of annual velocity maps.

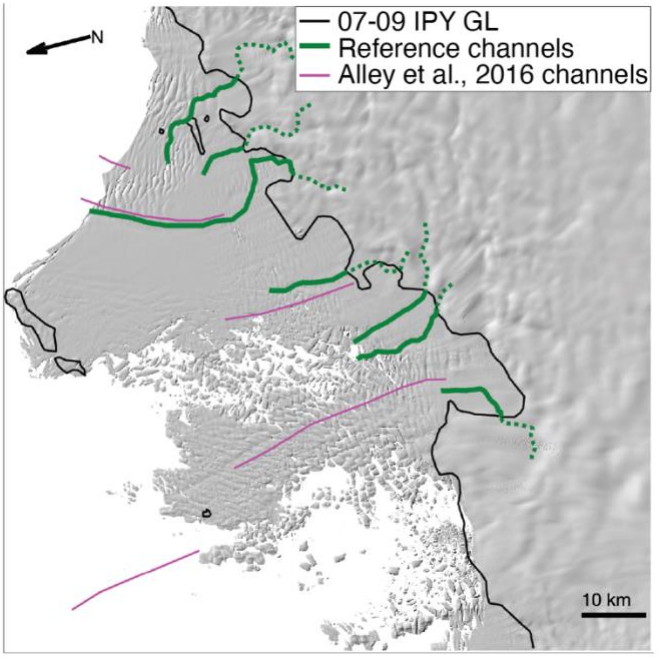

Figure S10: Hillshade showing our study's reference channels (green curves) and channels mapped by Alley et al. (2016) (magenta curves).