Supplement to: Circulation of Baffin Bay and Hudson Bay waters on the Labrador Shelf and into the subpolar North Atlantic

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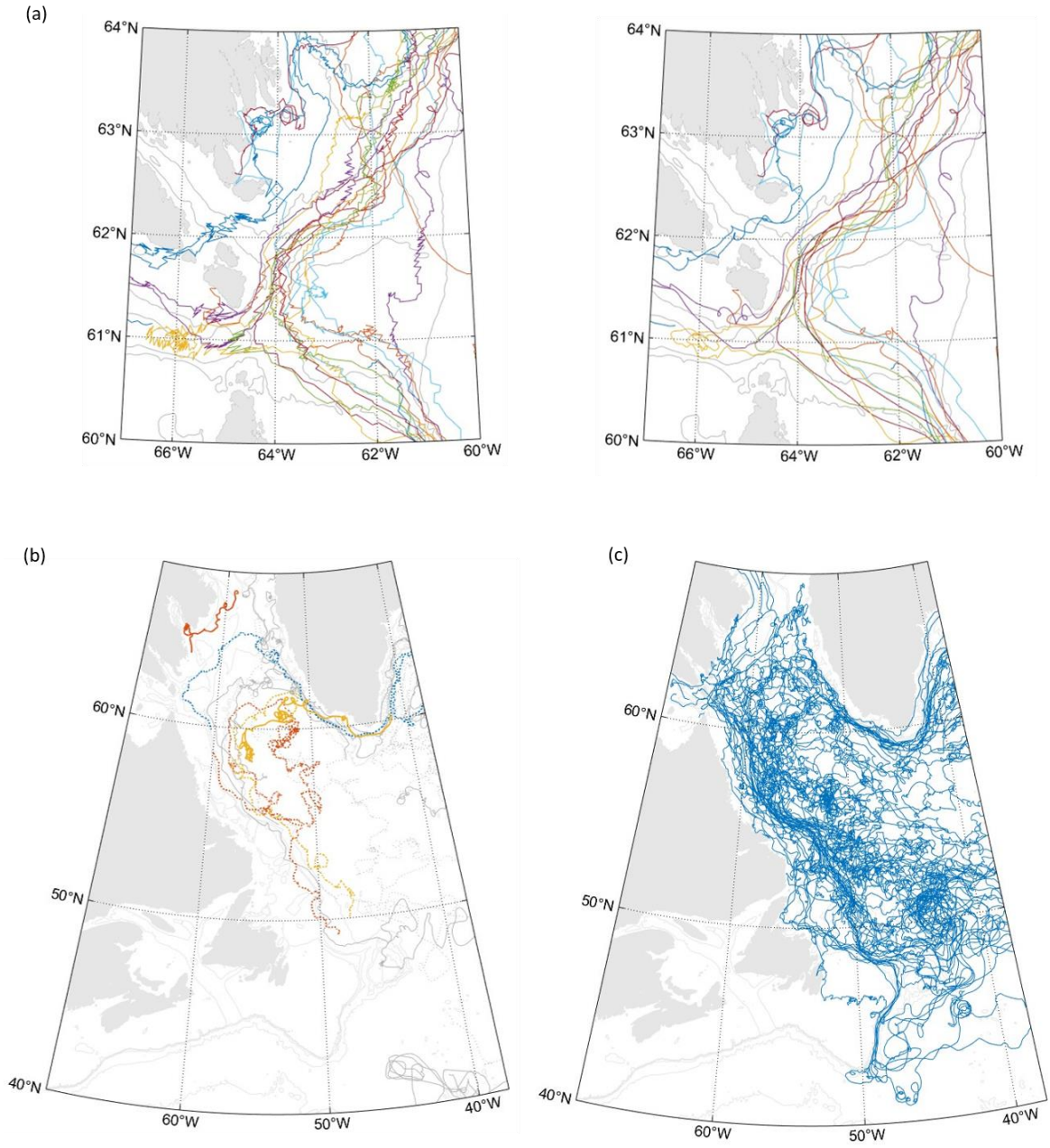

Figure S1: (a) Drifters from the TERIFIC Davis Strait deployment before (left) and after (right) applying the 25h Butterworth filter. (b) Trajectories of drifters that are cut after not transmitting for more than 30 days, and which part of the cut trajectory is over the Labrador Shelf. The trajectories are shown with solid lines before the data gap and with dotted lines after the gap. In red is the drifter used in Clément et al 2023, that appears to have been trapped under sea ice on the Baffin Island shelf and started transmitting again / emerged just a few days before it was exported. We treat trajectories after data gaps greater than 30 days in the same way as we treat data from drifters that lost their drogues. (c) Undrogued drifters over the Labrador Shelf. The figure shows all drifters that flowed over the Labrador Shelf (partly) while undrogued. These parts of the drifter trajectories are not used in the study because they cannot be trusted to properly represent the circulation as they are more directly influenced by winds and waves.

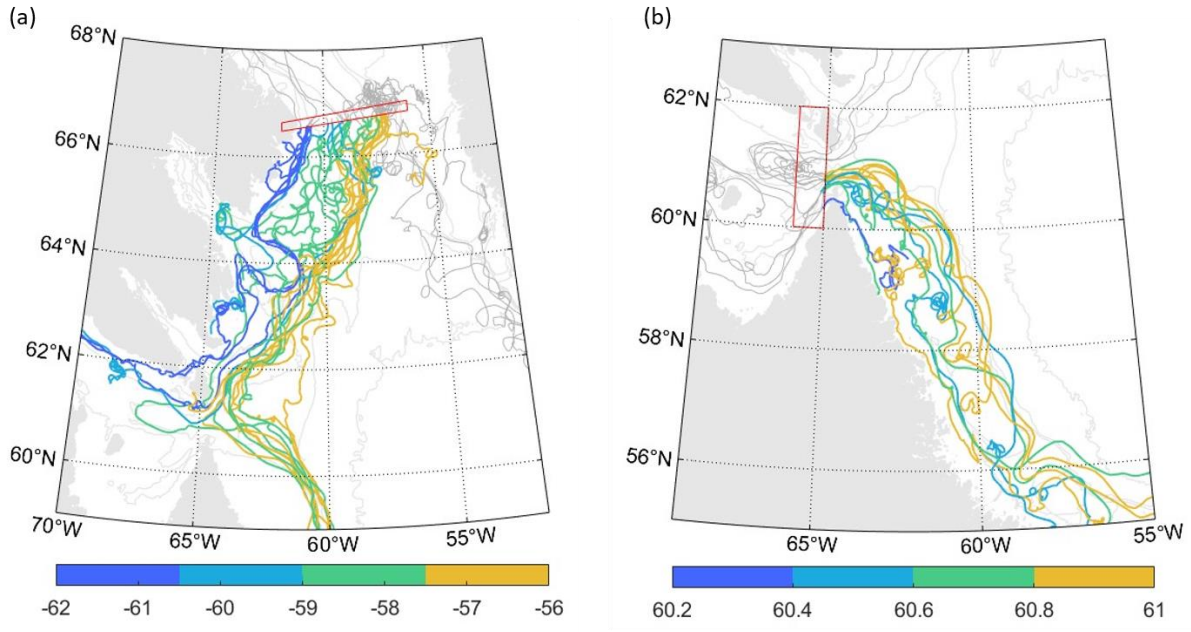

Figure S2: (a) Drifters heading southwards from Davis Strait, coloured by longitude when exiting the strait. The most onshore drifters at Davis Strait remain close to the coast as they flow downstream and make up the majority of drifters entering Hudson Strait. The most offshore drifters are recirculating from the West Greenland Current and part of them are found in the offshore current near Hudson Strait. (b) Drifters heading eastwards from Hudson Strait, coloured by latitude when leaving the strait. Only two of the drifters closely follow the coast past the strait. They both stop transmitting shortly after. The other drifters, even if close to the shelf when exiting the strait, are directed towards the shelfbreak over the Labrador Shelf, and only recirculate over the inner shelf south of 60°N.

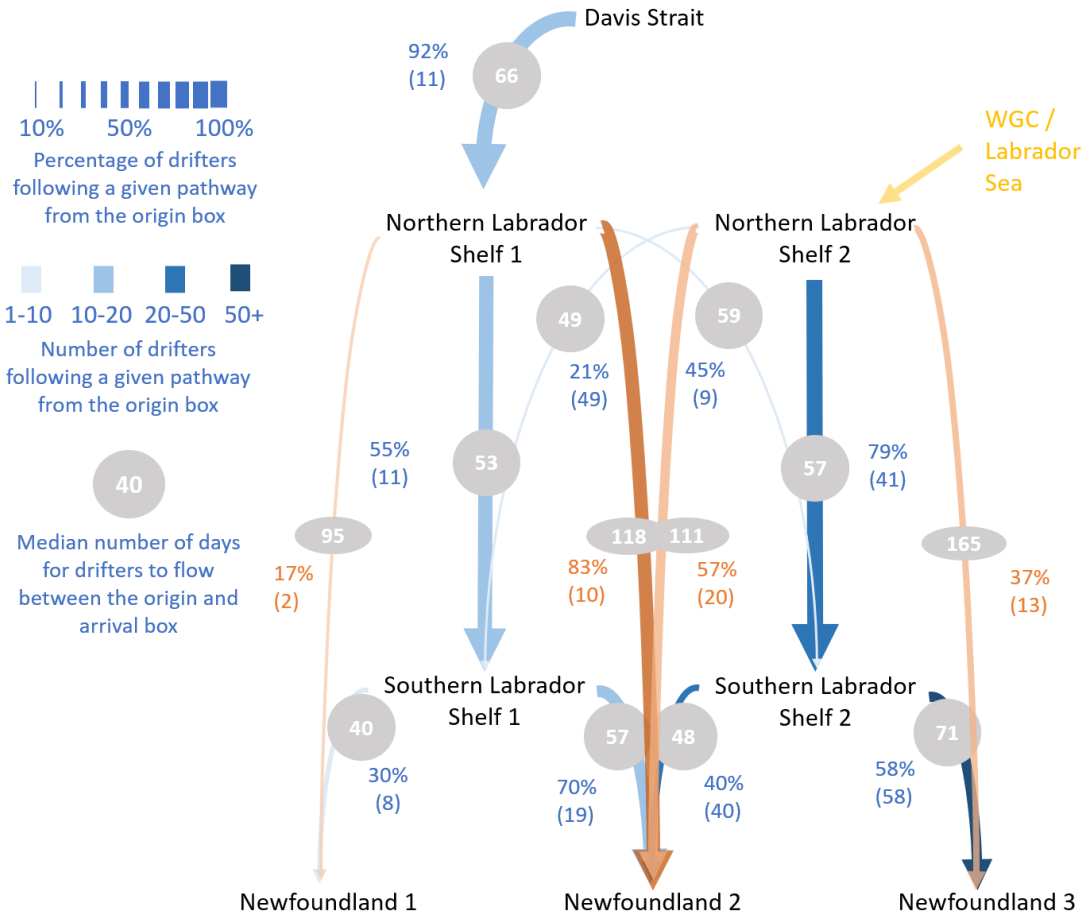

Figure S3: Same as Fig. 7, with direct connections between the Hudson Strait Mouth and Hamilton Bank, and between the Hudson Strait mouth to Newfoundland sections.

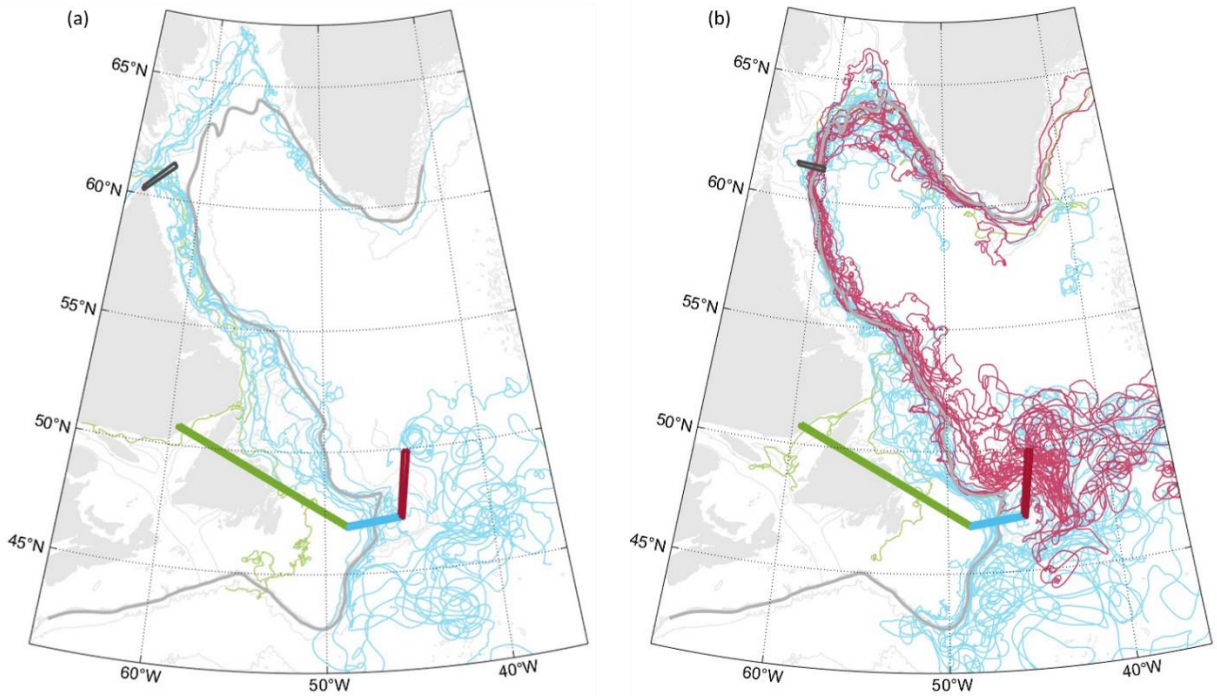

Figure S4: Same as Fig. 8, for drifters flowing between the northern Labrador Shelf and Newfoundland section. The colour of the trajectories corresponds to the box they cross at the Newfoundland section: Newfoundland Shelf (green), Flemish Pass (Blue), Flemish Cap (Red)

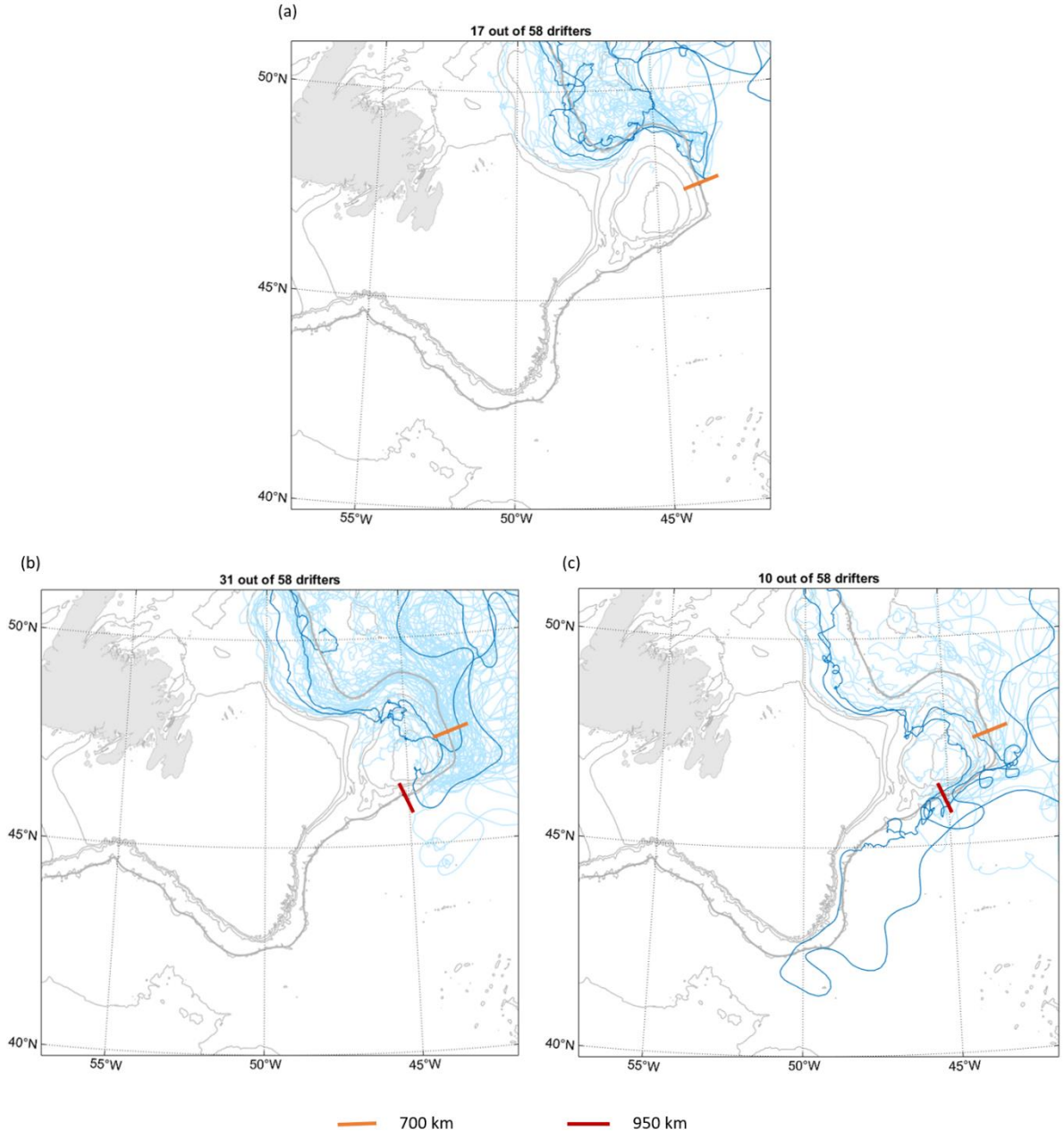

Figure S5: Same as Fig. 9, for drifters that crossed the Newfoundland section at the Flemish Cap segment. We use the 2500m isobath as shelf boundary (shown in bold grey), that we define in a similar manner as for the 1000m isobath as described in Sect. 2.2, but only in the Newfoundland region. As in Fig. 9, we separate different behaviours of drifters that flowed through Flemish Cap by computing where they left the shelf boundary. The three panels show drifters that left the Flemish Cap area: (a) In the northern part of Flemish Cap (before 700km along the shelf, orange section), (b) In the south-eastern part of Flemish Cap (700-950km, orange to red sections), (c) At the southwestern end of Flemish Cap and beyond (past 950km, red section). In all cases, the darker blue trajectories represent examples of trajectories for the group of drifters. Bathymetry in light grey, 5000, 2500, 1000, 500, 250m isobaths.