Supporting Information for "Tracing glacial meltwater from the Greenland Ice Sheet to the ocean using gliders"

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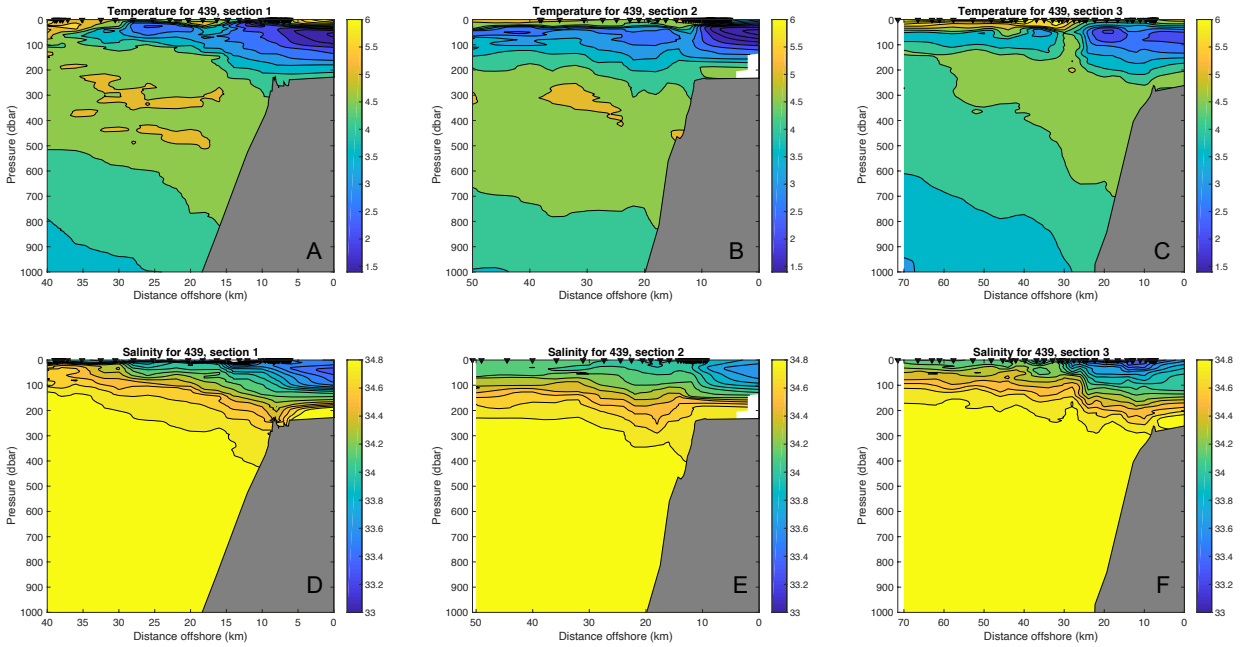

Figure S1. Temperature (A-C) and salinity (D-F) profiles from glider 439 along each section 1-3 from Figure 1. Triangles show where the glider surfaced.

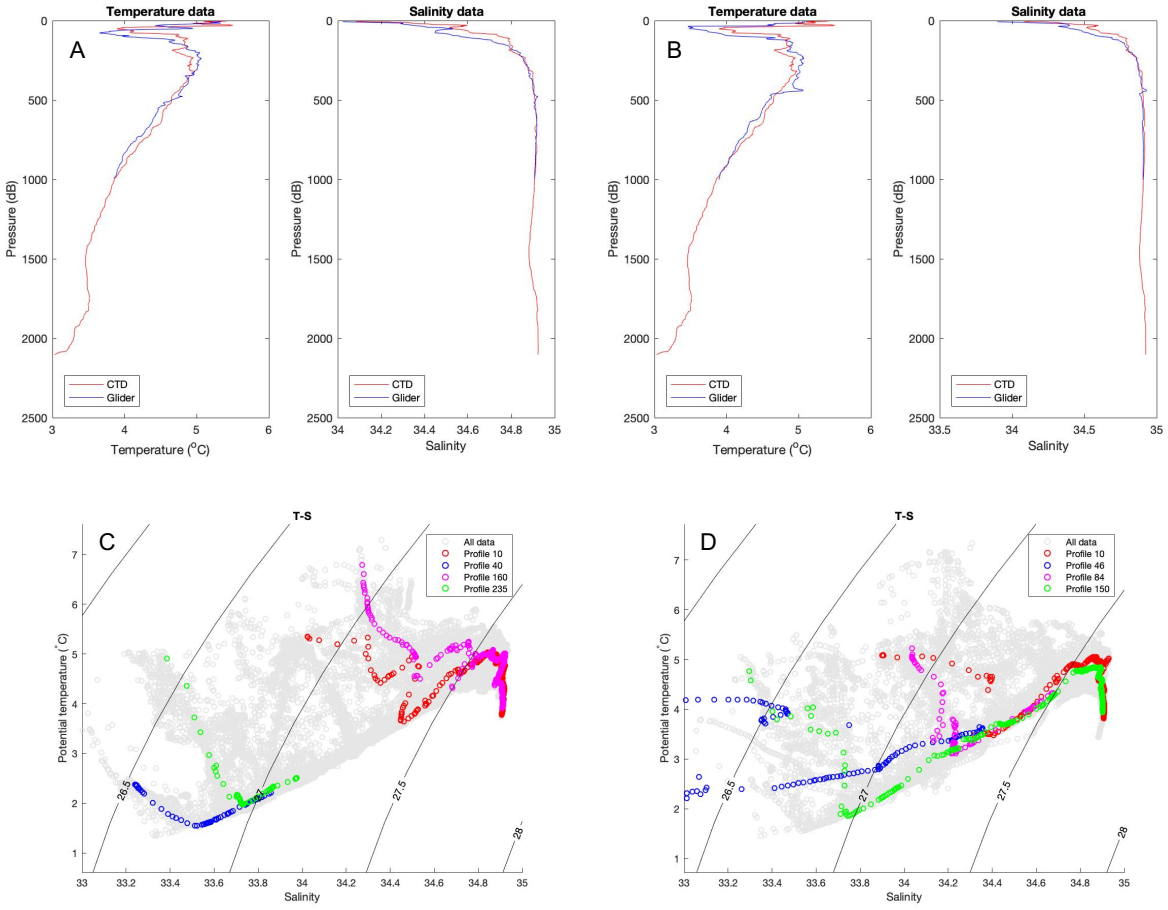

Figure S2. Temperature and salinity profiles (corrected for thermal lag) from the first dives of glider units 331 (A) and 439 (B) compared to shipboard CTD003 profile. Note that the gliders were deployed at approximately 62.9°N, 52.6°W at 6am (331) and 8am (439), and the CTD cast was carried out on at the same location at 10am, on July 17th 2017. (C) Potential temperature plotted against salinity for all data (grey) and for four example profiles from on-shelf waters (Profiles 40 and 235) and off-shelf (Profiles 10 and 160), for glider unit 331. Contours show density calculated at the surface in kg/m^3. (D) Potential temperature plotted against salinity for all data (grey) and for four example profiles from on-shelf waters (Profiles 40 and 235) and off-shelf (Profiles 10 and 160), for glider unit 439. Contours show density calculated at the surface in kg m^{-3}.

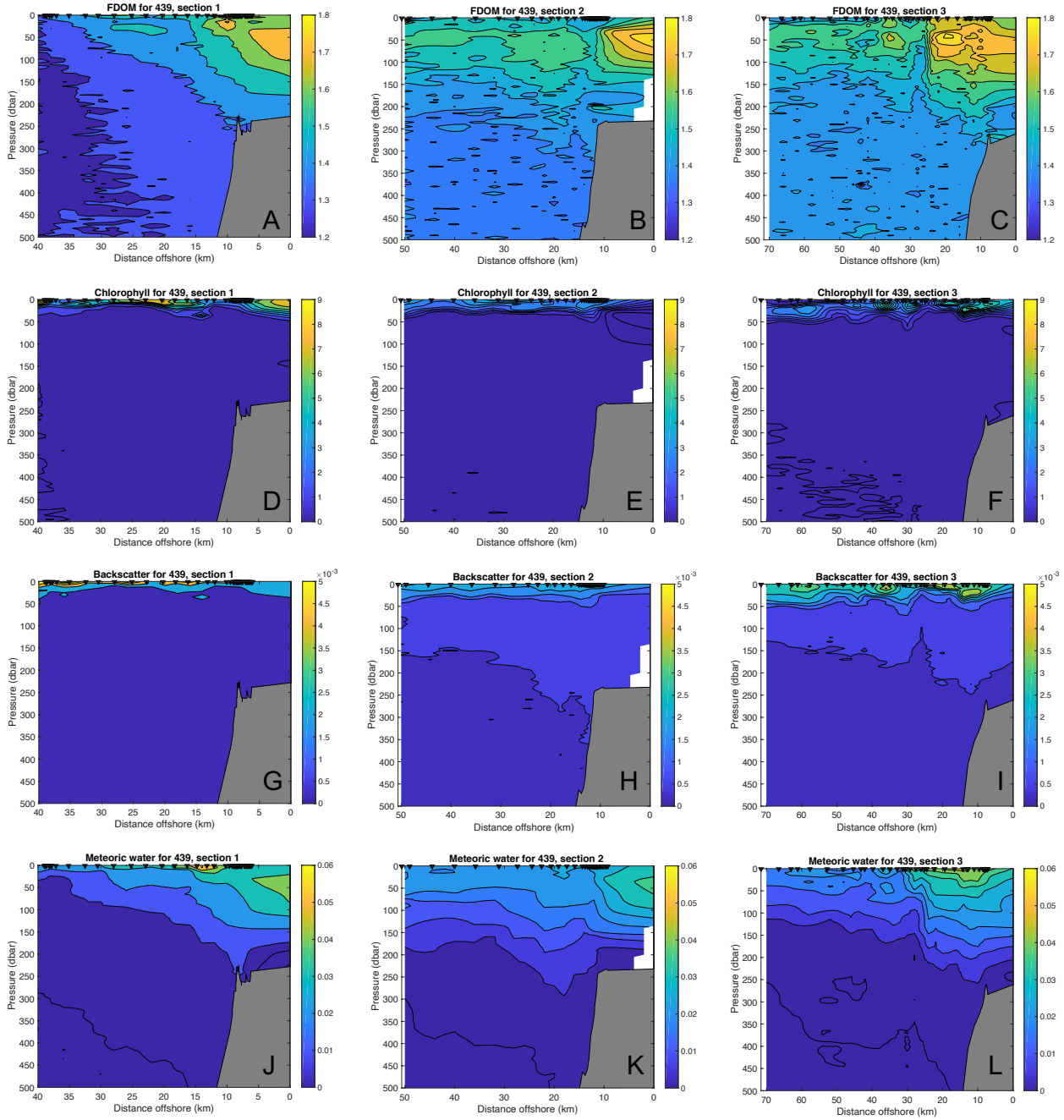

Figure S3. (A-C) FDOM, (D-F) quenching corrected chlorophyll fluorescence, (G-I) Particulate backscattering coefficient (b_{bp}), and (J-L) calculated meltwater proportion for glider unit 439, along each section 1-3 from Figure 1. See main text for calculations. Triangles show where the glider surfaced.

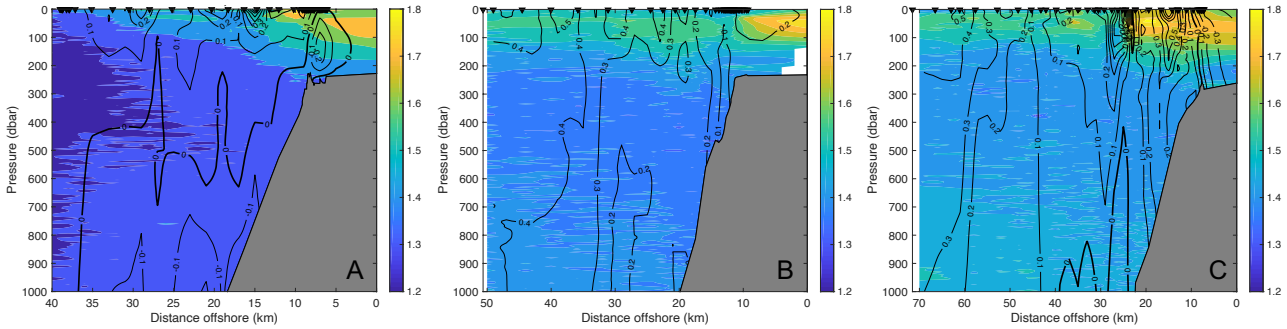

Figure S4. Gridded FDOM in colour (ppb) and velocities (contours in m s^{-1}) perpendicular to each glider section for the three sections shown in Figure 1 for glider 439 (positive northwards). Triangles show where the glider surfaced.

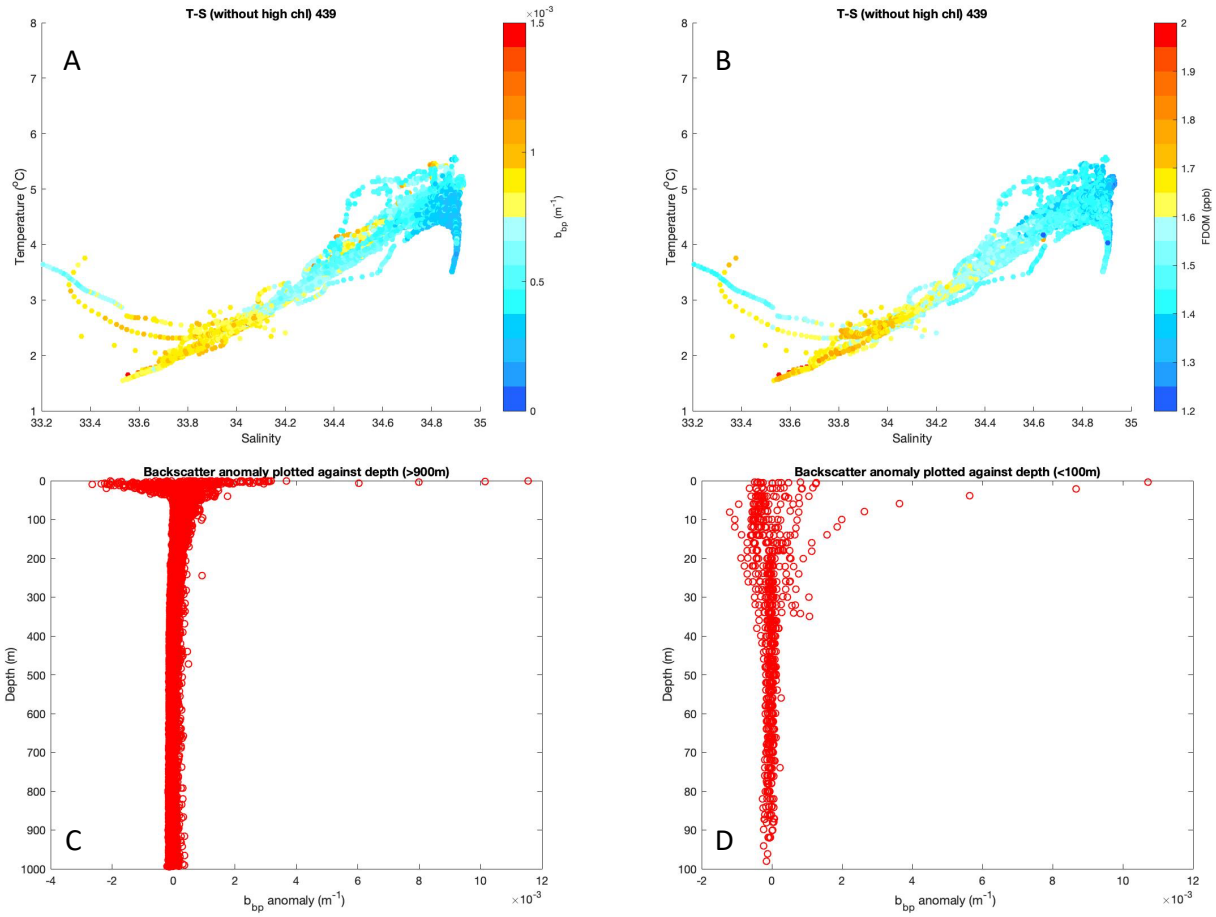

Figure S5. Cross plots for glider unit 439 of temperature and salinity, colour-scaled for b_{bp} (A) and FDOM (B), with data only from depth with uncorrected chlorophyll fluorescence <0.2 mg m^{-3}. Backscatter bbp anomaly (difference between measured and predicted backscatter from correlation with chlorophyll, plotted for profiles in waters with bottom depth >900 m (C) and <100 m (D). See main text for full calculations.

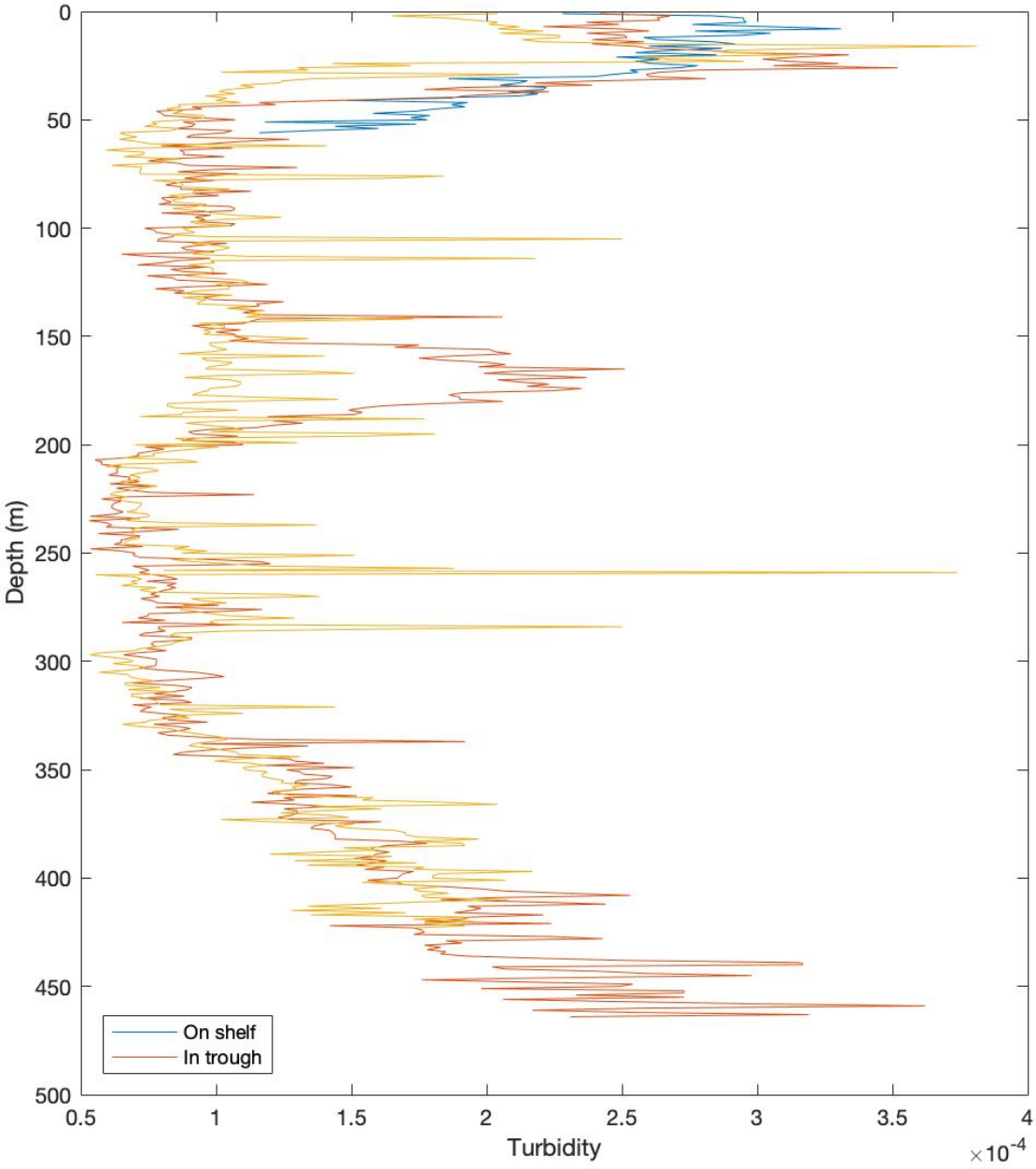

Figure S6. Turbidity data from shipboard CTD depth-profiles during expedition DY081. The blue line shows the turbidity profile on the shelf, and the red and yellow lines show two profiles within a prominent glacial trough. Note the increase in turbidity mid-depth and within 100 m of the profiles in the glacial trough, indicative of resuspension.

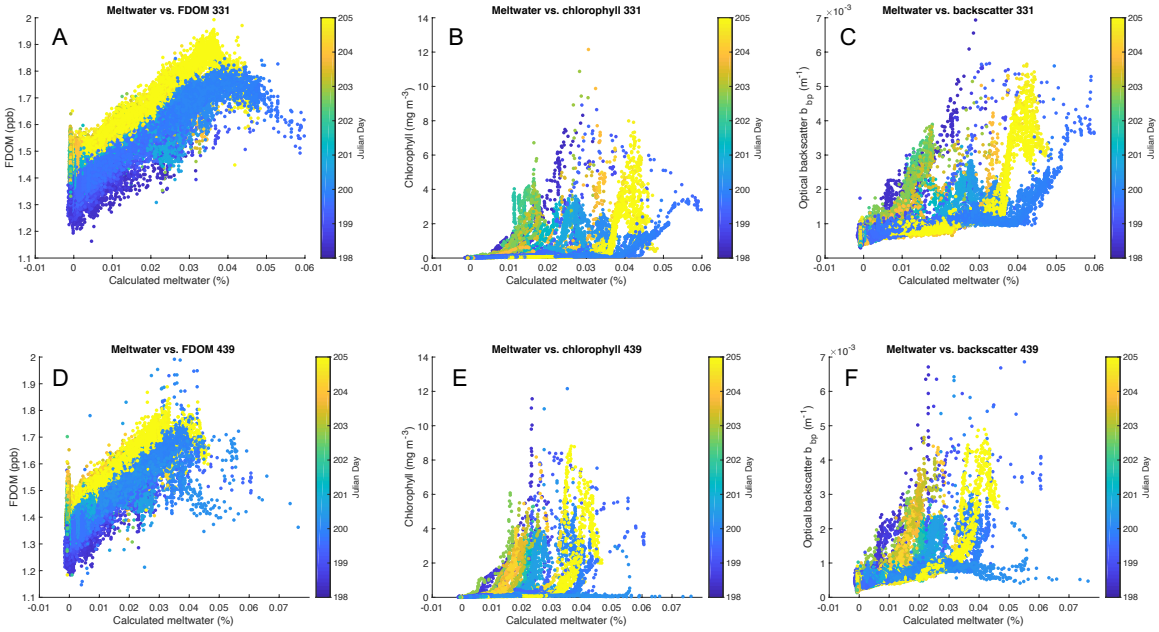

Figure S7. Correlations between calculated meltwater proportion and FDOM, quenching-corrected chlorophyll and optical backscatter for unit 331 (A-C) and unit 439 (D-F). See main text for calculations. Colour scale indicates Julian Day.

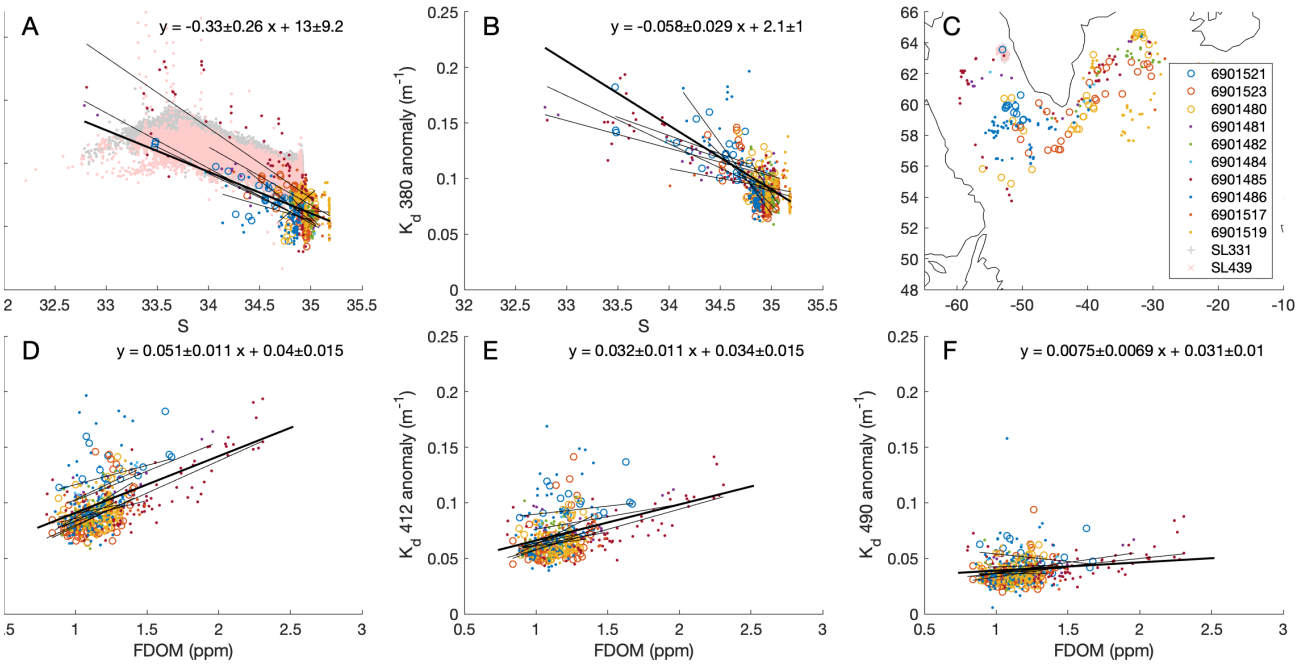

Figure S8. Regional relationships between FDOM, Salinity, and K_d from BGC Argo floats. Individual panels show relationships between salinity and FDOM (A), salinity and K_d380 (B), FDOM and K_d380 (D), FDOM and K_d412 (E), FDOM and K_d490 (F). Panel C shows a map with the locations of the float and glider data. Pale symbols (pink and grey) represent glider data from this study. Other colours represent data from 10 BGC Argo floats. Float data all come from the top 100 m (where natural light is strong enough to measure K_d). Thin black lines show individual type-I linear regressions for each float and thick black lines show linear relationships derived from the mean coefficients of the individual regressions. Equations in panels show mean ± 2 standard errors for the coefficients of the regression equations.

Table S1. Configuration of Slocum gliders during DY081. Prior to loading, the units underwent in-house refurbishment at the National Oceanography Centre Southampton and were configured and ballasted for 1027.0 at 3°C in preparation for deployment.

Component	**Unit 331 ('Coprolite')**	**Unit 439 ('HSB')**
Slocum TWR FWD	SN:1400153 (INV260002528)	SN:1300108 (INV260002521)
Slocum TWR AFT	SN:1400115 (INV260002513)	SN:1300100 (INV260002505)
Slocum deep pump	SN: 120 (INV260001982)	SN:210 (INV260000276)
G2 DigiFin	SN:1467 (INV. 260000277)	
Slocum science bay (pumped)	SN:1115 (INV250008907)	SN:1103 (INV260001980)
Aanderaa Optode	SN:143 (INV250008327)	SN:243 (INV250002409)
Firmware	GliderDos 7.18/SciDos 3.21	GliderDos 7.18/SciDos 3.21
WETLabs puck	SN:3354 (INV260002075)	SN:3347 (INV260002070)