Supplementary material

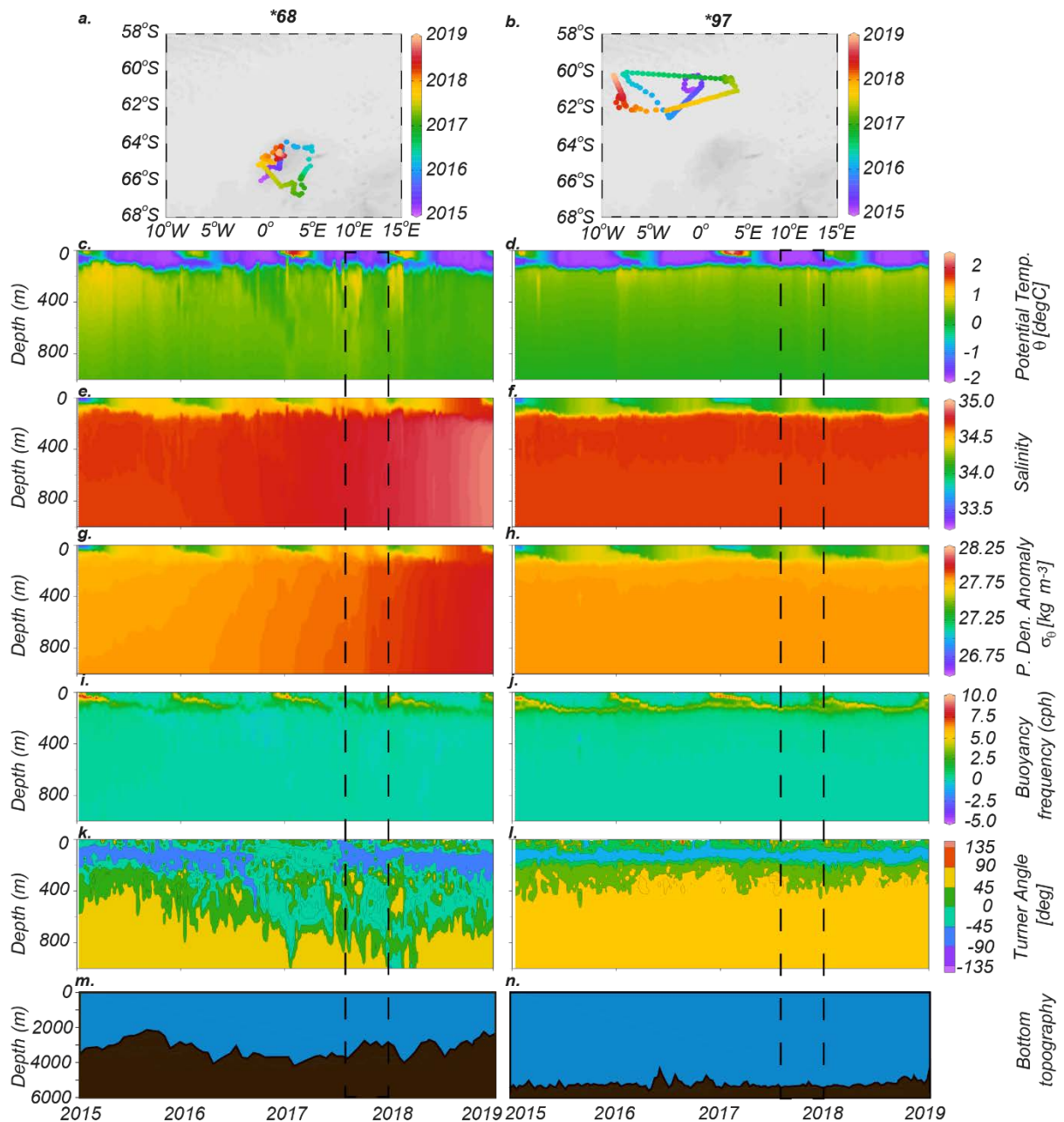**Figure S1**. From top to bottom: Float location (a, b). Potential temperature (T in °C) (c, d). Salinity (S) (e,f). Potential density anomaly ($\sigma_\theta = \rho_\theta - 1000$ kg m^{-3}) (g, h). Buoyancy frequency (N in cycles per hour) (i, j). Turner angle (T_U in rotation degrees) (k, l). And bathymetry sections (meters) (m, n) for the data time series of the SOCCOM *68, and *97, for the MRR and NMR, respectively. The data cover from January 2015 – January 2019 and profiles depth from 0 to 1000 m. (Dashed line) Marks the period of the 2017 Polynya event.
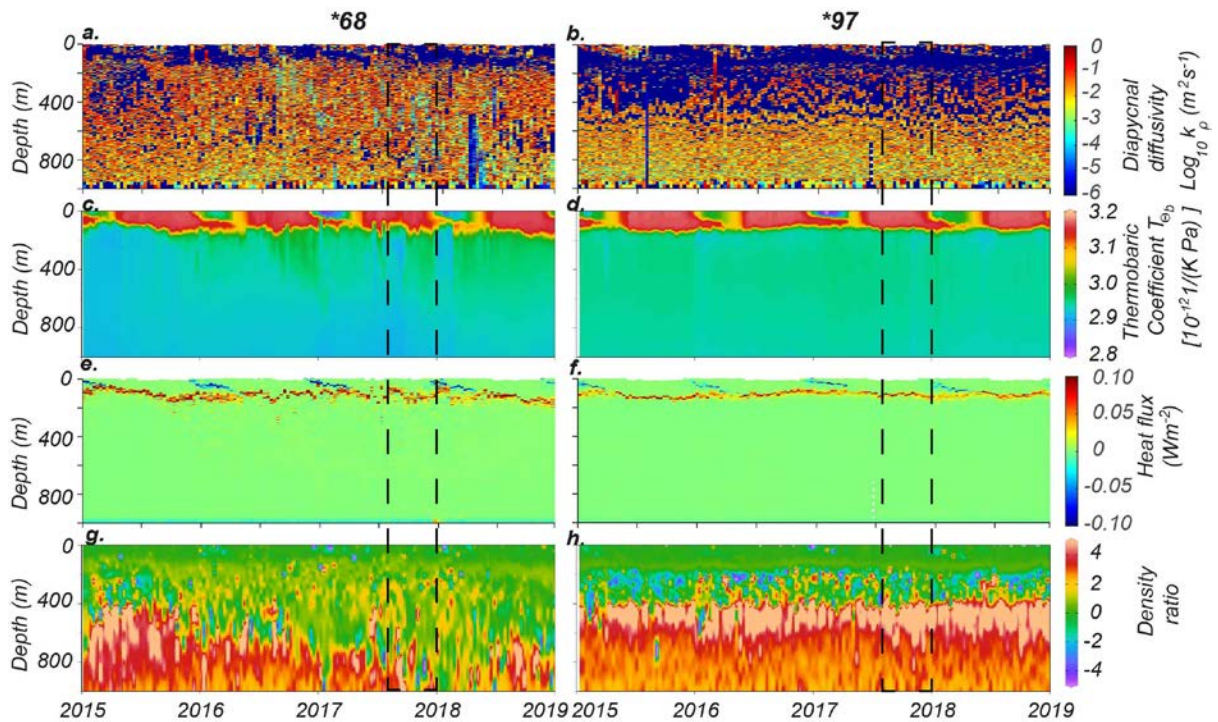
Figure S2. From top to bottom: Diapycnal diffusivity (k_ρ), thermobaric coefficients, heat flux (F_H in W m^{-2}), and density ratio (R_ρ in m), of the SOCCOM *68 (a, c, e, g), and *97 (b, d, f, h), representative for the NMR and MRR, respectively. The data span January 2015 – January 2019 and the profile depths are shown from 0 to 300 m. (Dashed line) Marks the period of the 2017 Polynya event.