Large-scale forcing of the European Slope Current and associated inflows to the North Sea - Supplementary Material

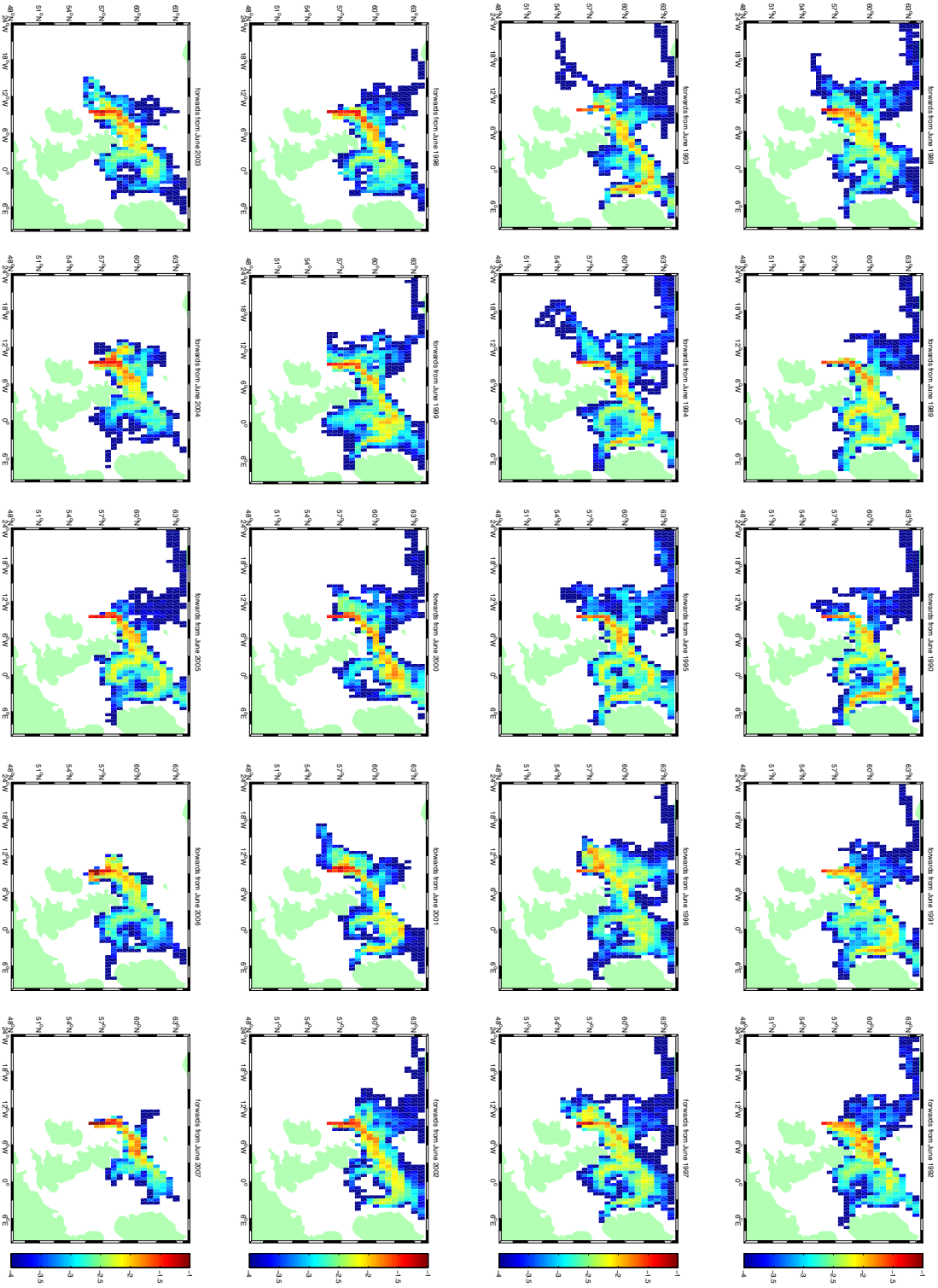


Figure S1. Particle density maps (0.5° x 0.5° resolution) for all ensembles of forward trajectories starting on 1 July, 1988-2007 (note log scale).

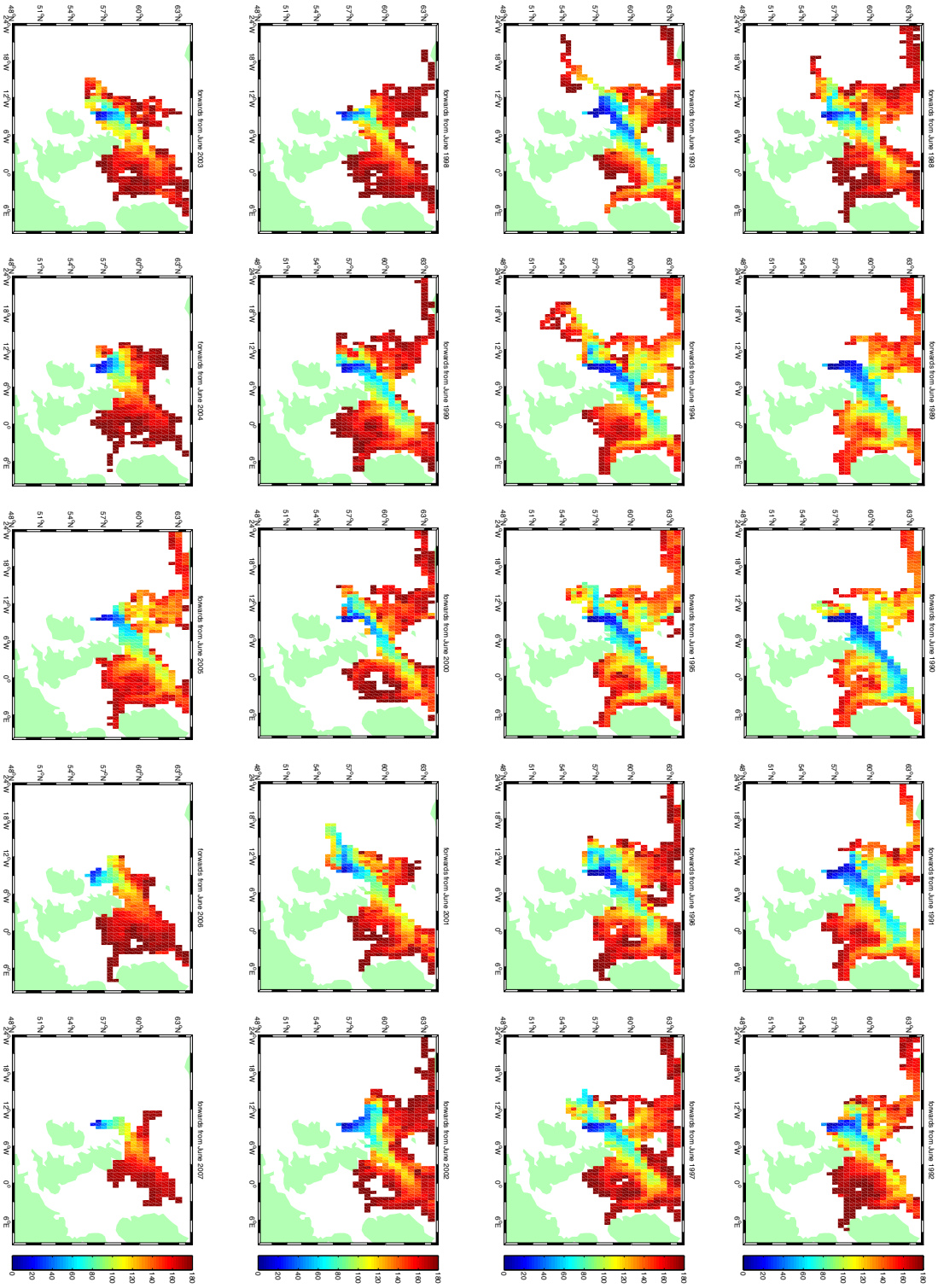


Figure S2. Particle age maps (binned at 0.5° x 0.5° resolution) for all ensembles of forward trajectories starting on 1 July, 1988-2007 (days since 1 July).

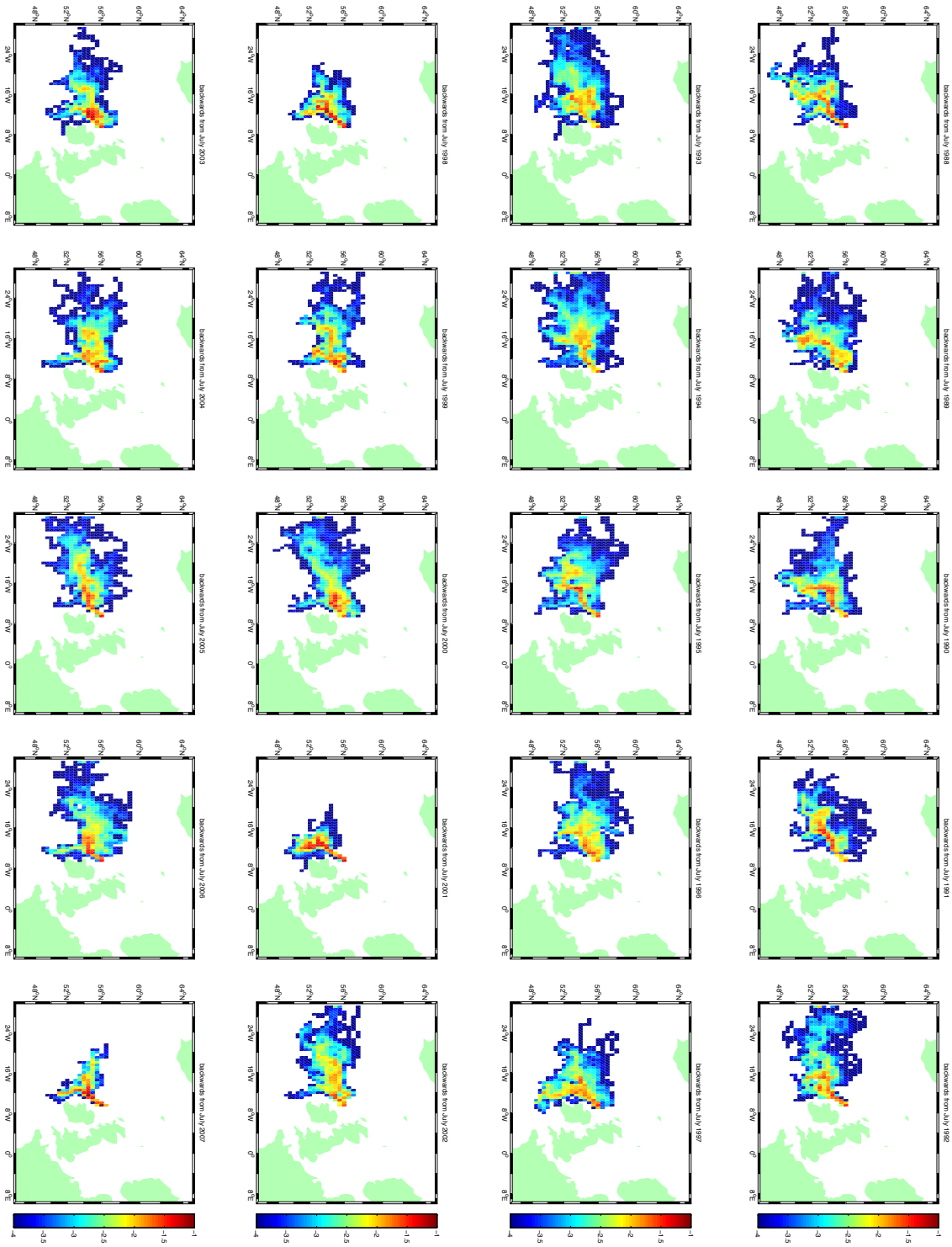


Figure S3. As Fig. S1, for backward trajectories.

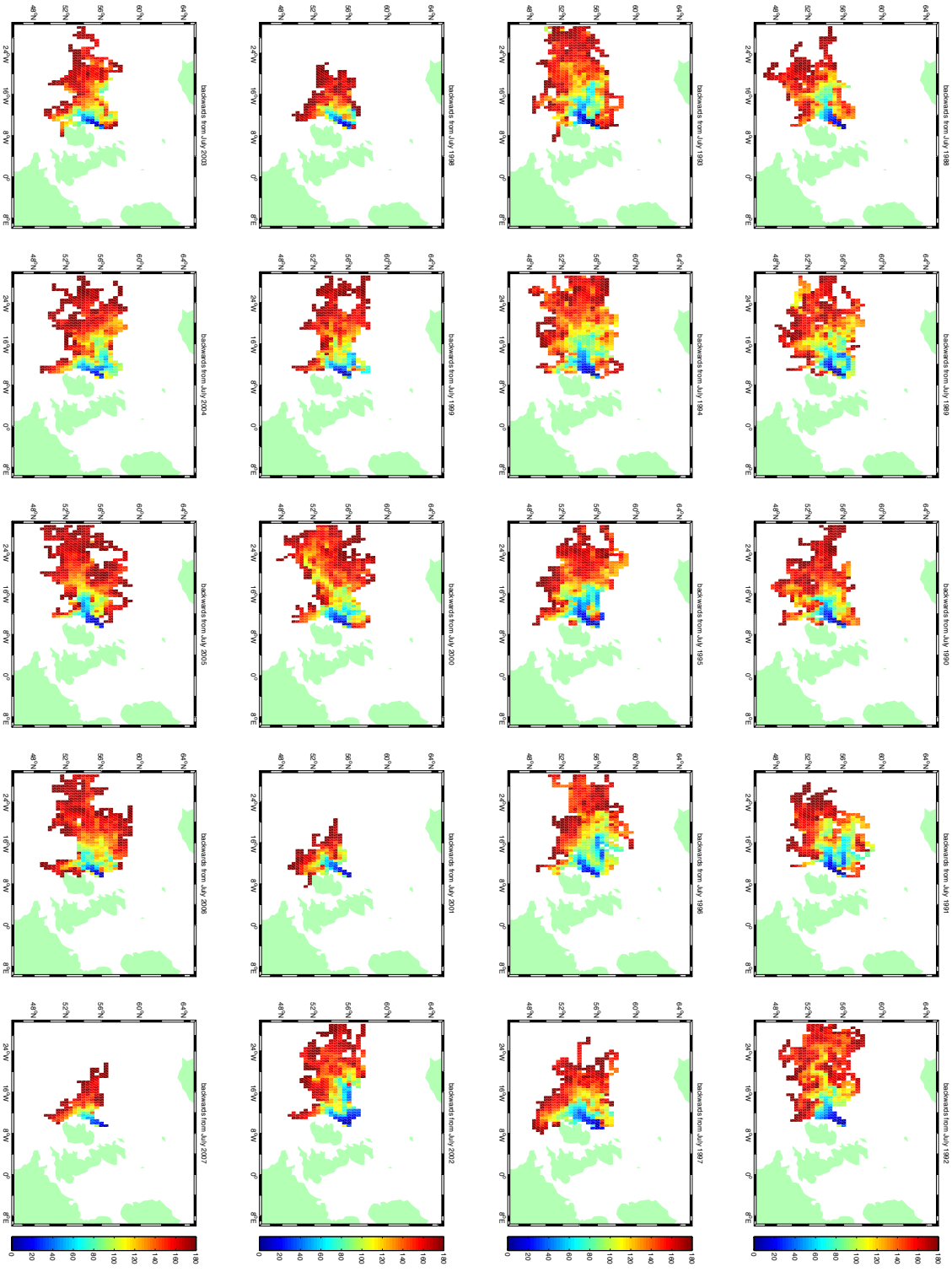


Figure S4. As Fig. S2, for backward trajectories.

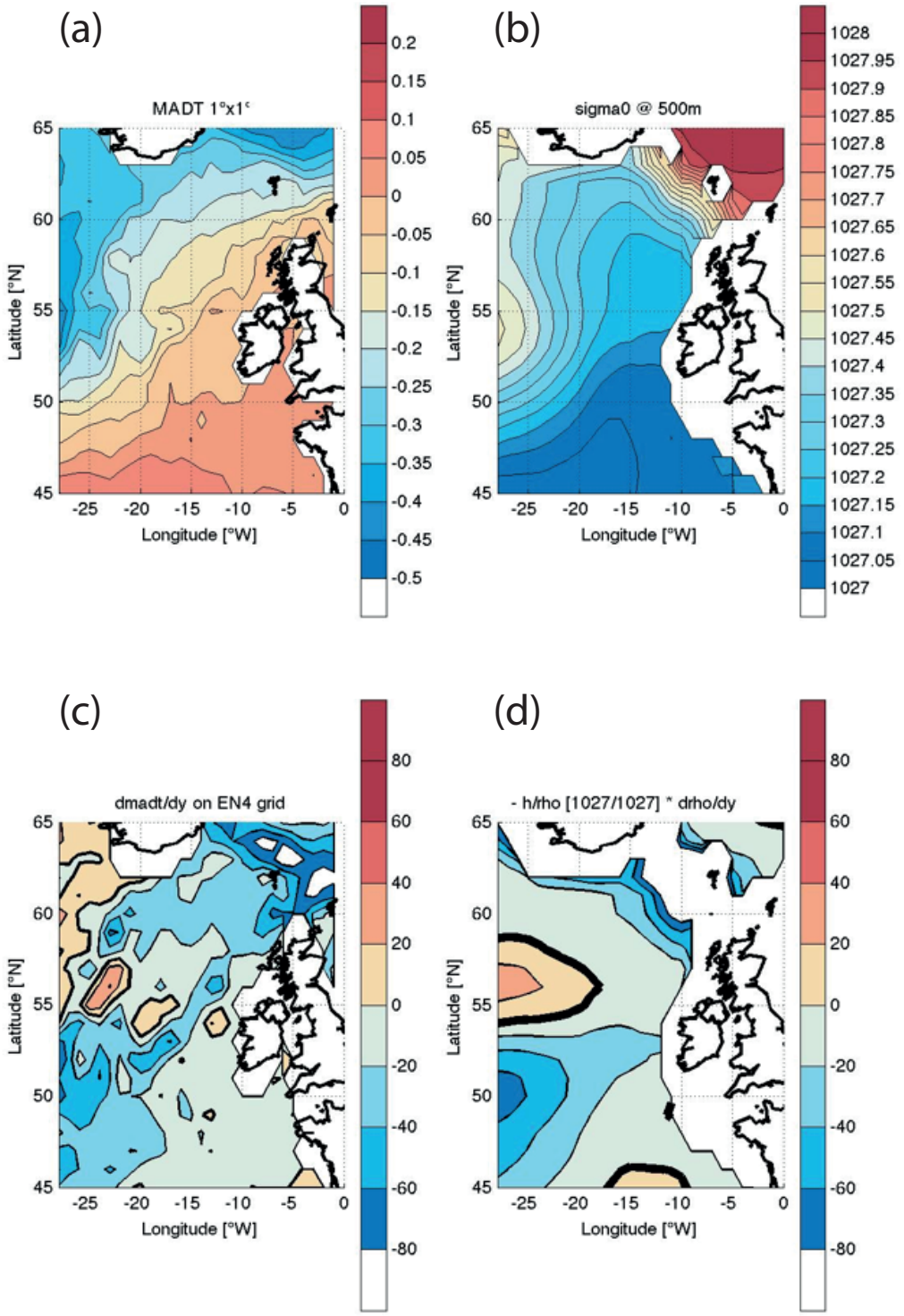


Figure S5. (a) mean absolute dynamic topography (MADT); (b) mean σ_0 at 500m; (c) meridional gradient of MADT, i.e., the left hand side of Eq. (7); (d) meridional gradient of σ_0, scaled by $-H/\rho$ (nominally 1027 m/1027 kg m^{-3}) i.e., the right hand side of Eq. (7).

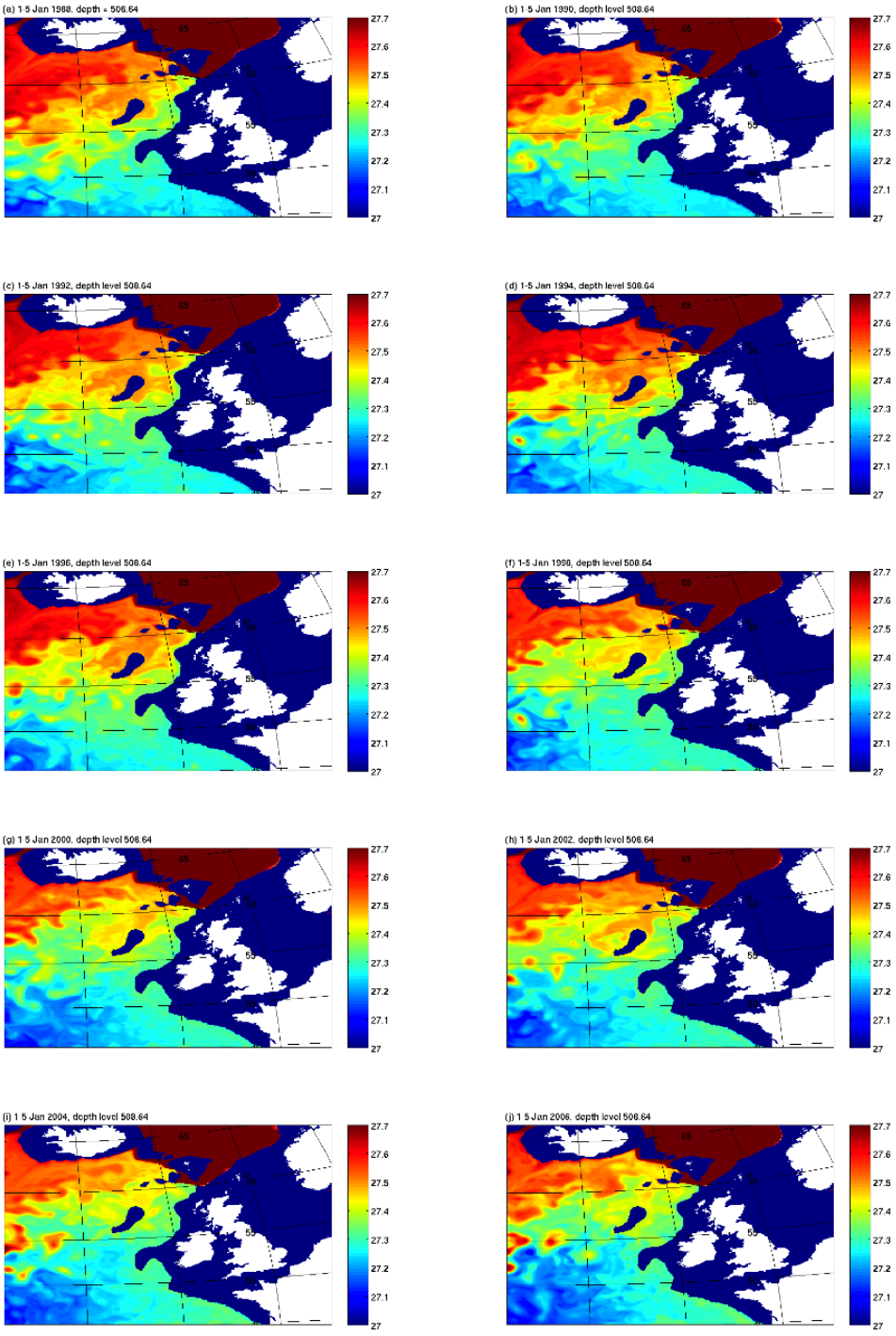


Figure S6. Potential density (σ_0) at 500 m, 1-5 January biennially, 1988-2006, ORCA12-N01.

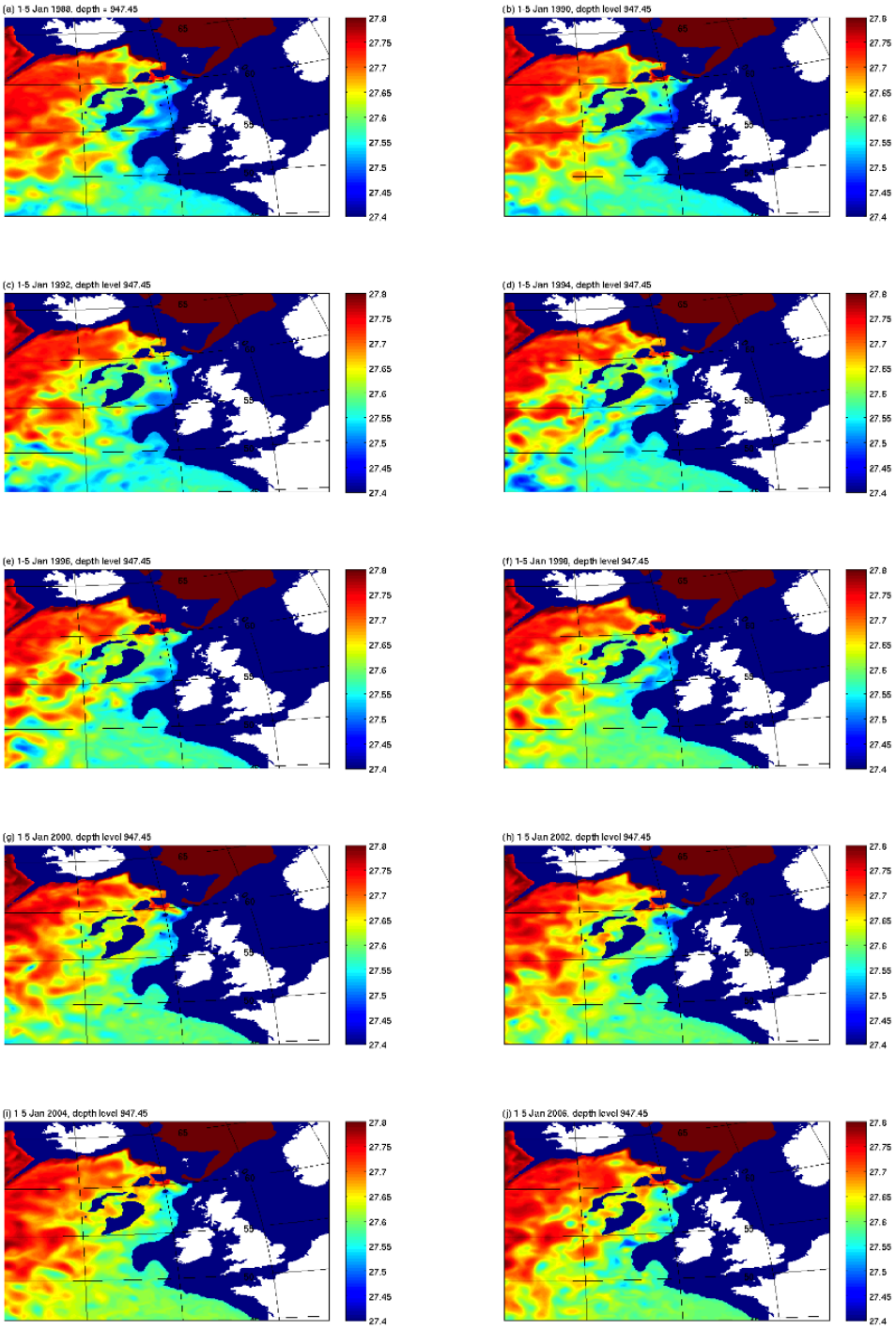
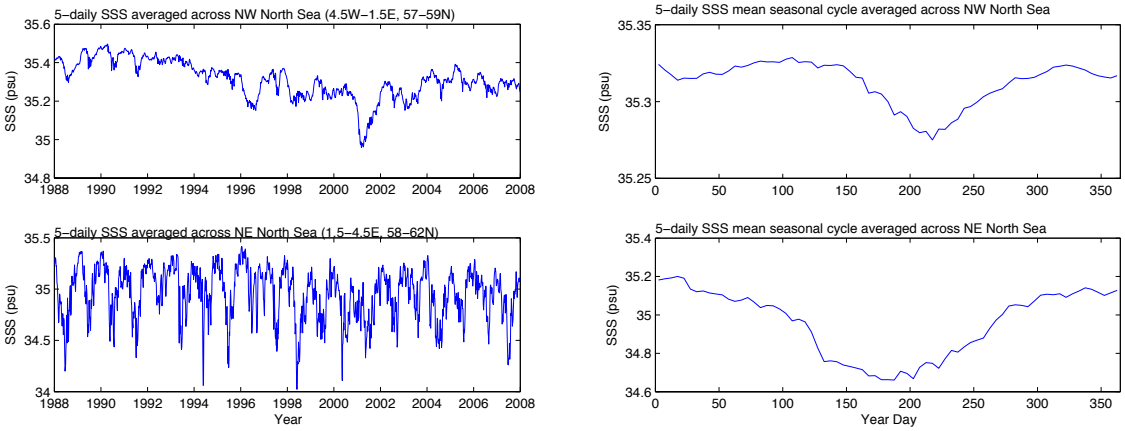


Figure S7. Potential density (σ_0) at 947 m, 1-5 January biennially, 1988-2006, ORCA12-N01.



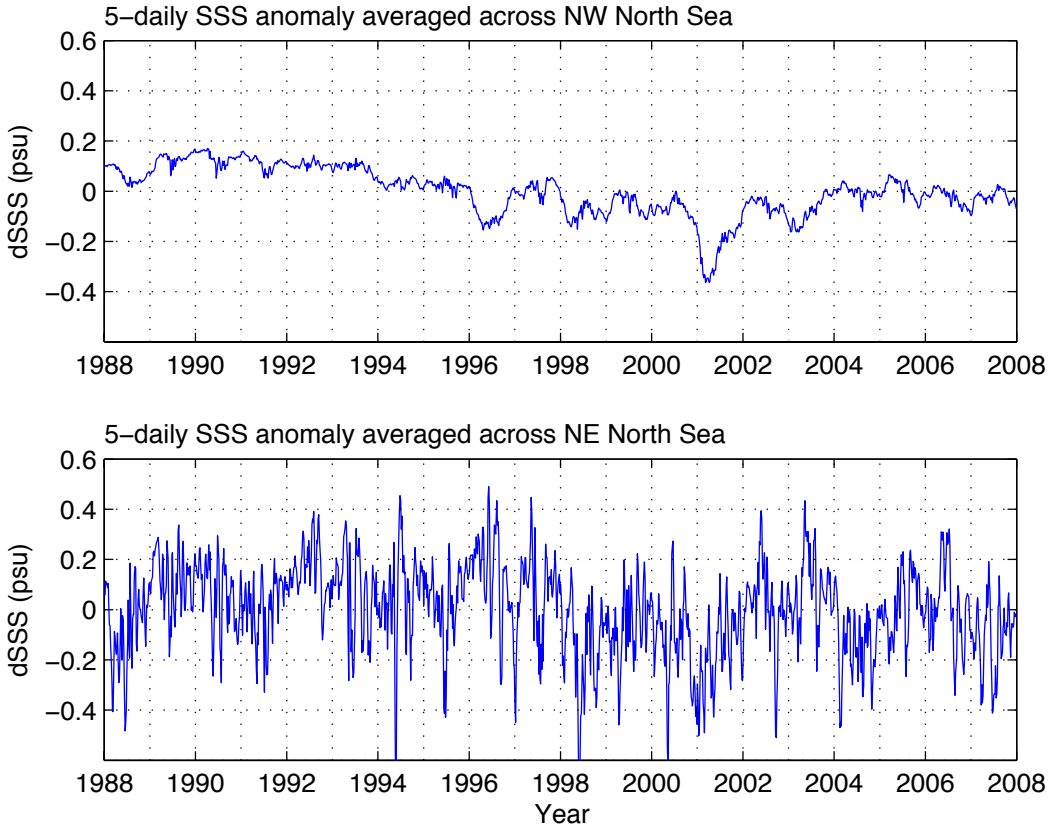
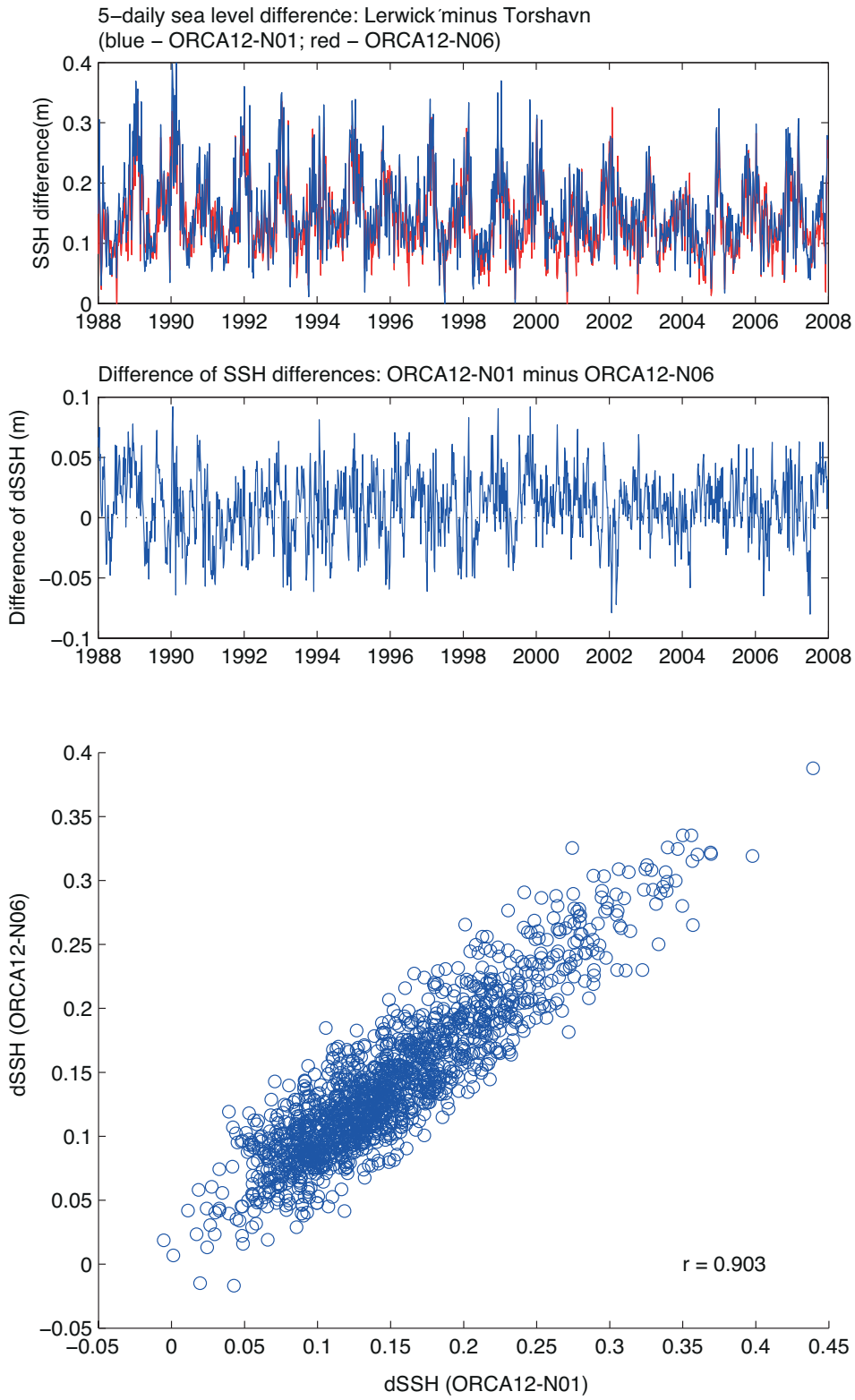


Figure S8. Area-averaged surface salinity (top left panels), mean seasonal cycles (top right panels) and anomalies (bottom panels) in the northwest and northeast North Sea, 5-daily in ORCA12N01.



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3 **Figure S9. Comparison of ORCA12-N01 and ORCA12-N06 hindcasts over 1988-2007: 5-**
4 **day averages of sea level difference, Lerwick minus Torshavn (top panel); ORCA12-N01**
5 **minus ORCA12-N06 differences (middle panel); scatterplot of individual sea level**
6 **differences.**