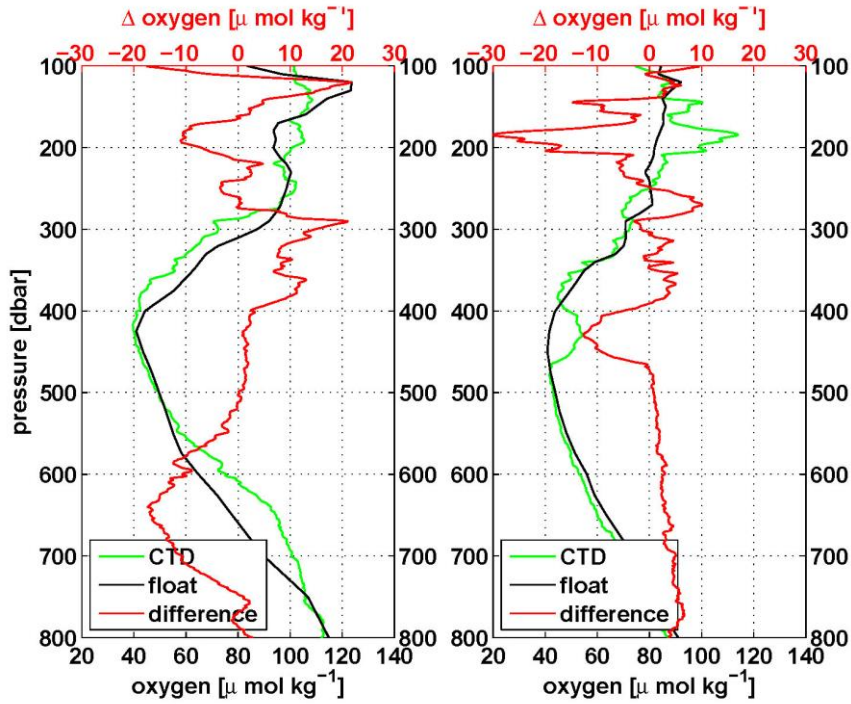


1 Supplementary figures

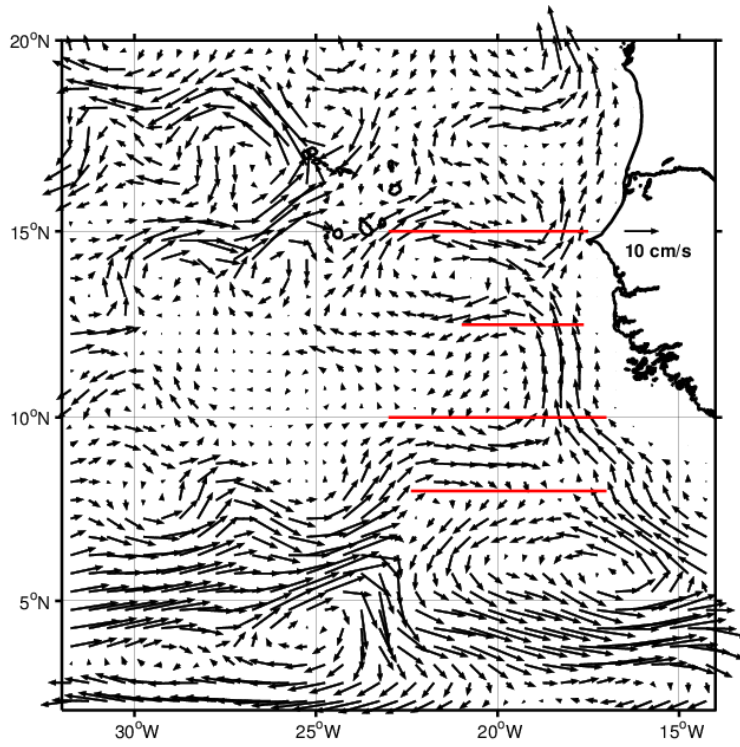
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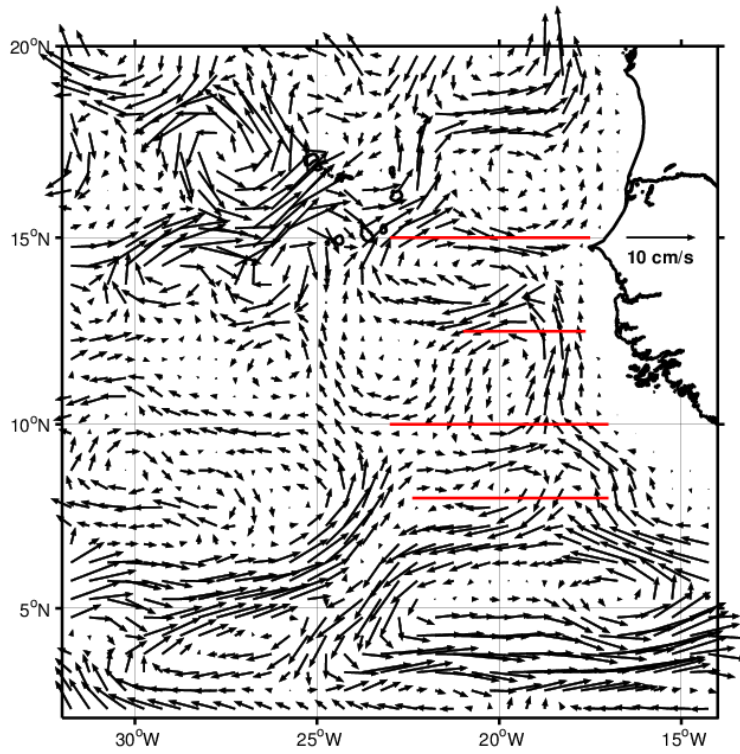
3

4 Fig. S1. Vertical profiles of CTD derived dissolved oxygen (green), float derived dissolved
5 oxygen (black curve) and difference (float minus CTD) after 18 respectively 19 months
6 operating time for float f330 with a CTD-oxygen profile 3 days and 68 km apart (left) and
7 float f350 with a CTD-oxygen profile 0 days and 36 km apart (right).

8



1



2

3 Fig. S2. SODA model mean October/November 2010 circulation for the layer 50 to 200 m
 4 (top) and 200 to 400 m (bottom). The geographical locations of the zonal sections measured
 5 in October 2010 (presented in Fig. 5) are shown as red lines.

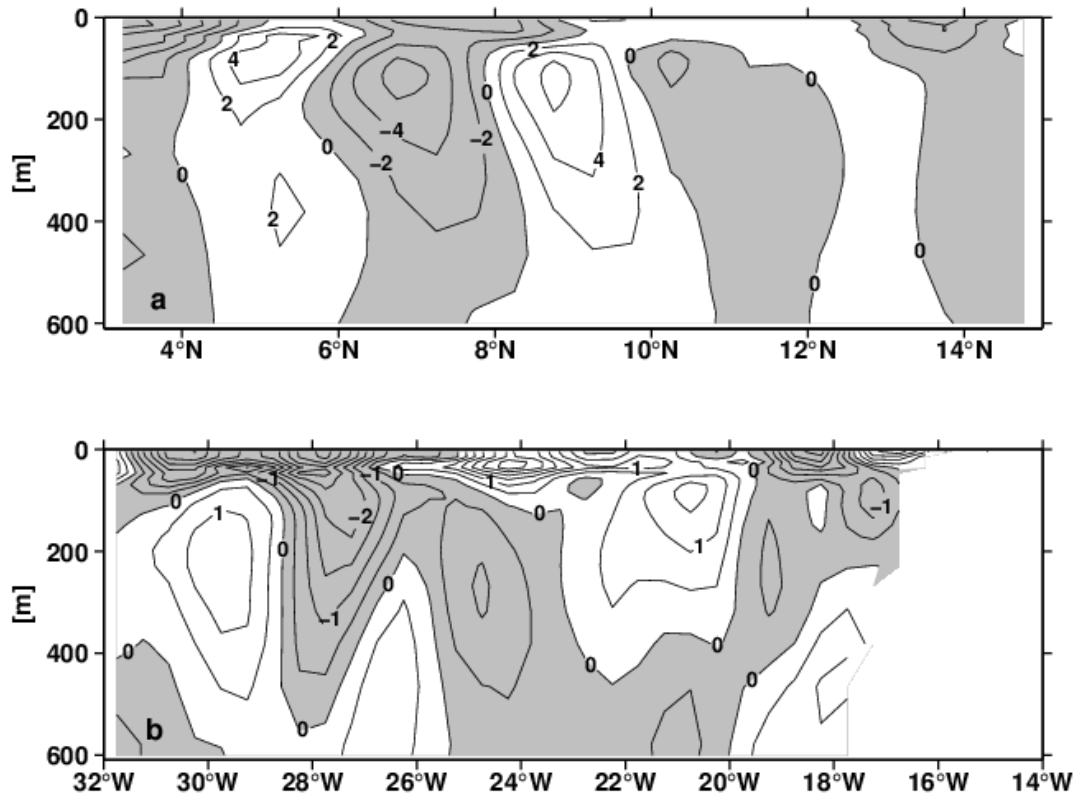


Fig. S3. SODA model velocity anomaly sections in cm s^{-1} between the year 2009 and the 2001 to 2010 mean for a) 23°W (positive eastward) and b) 10°N (positive northward).

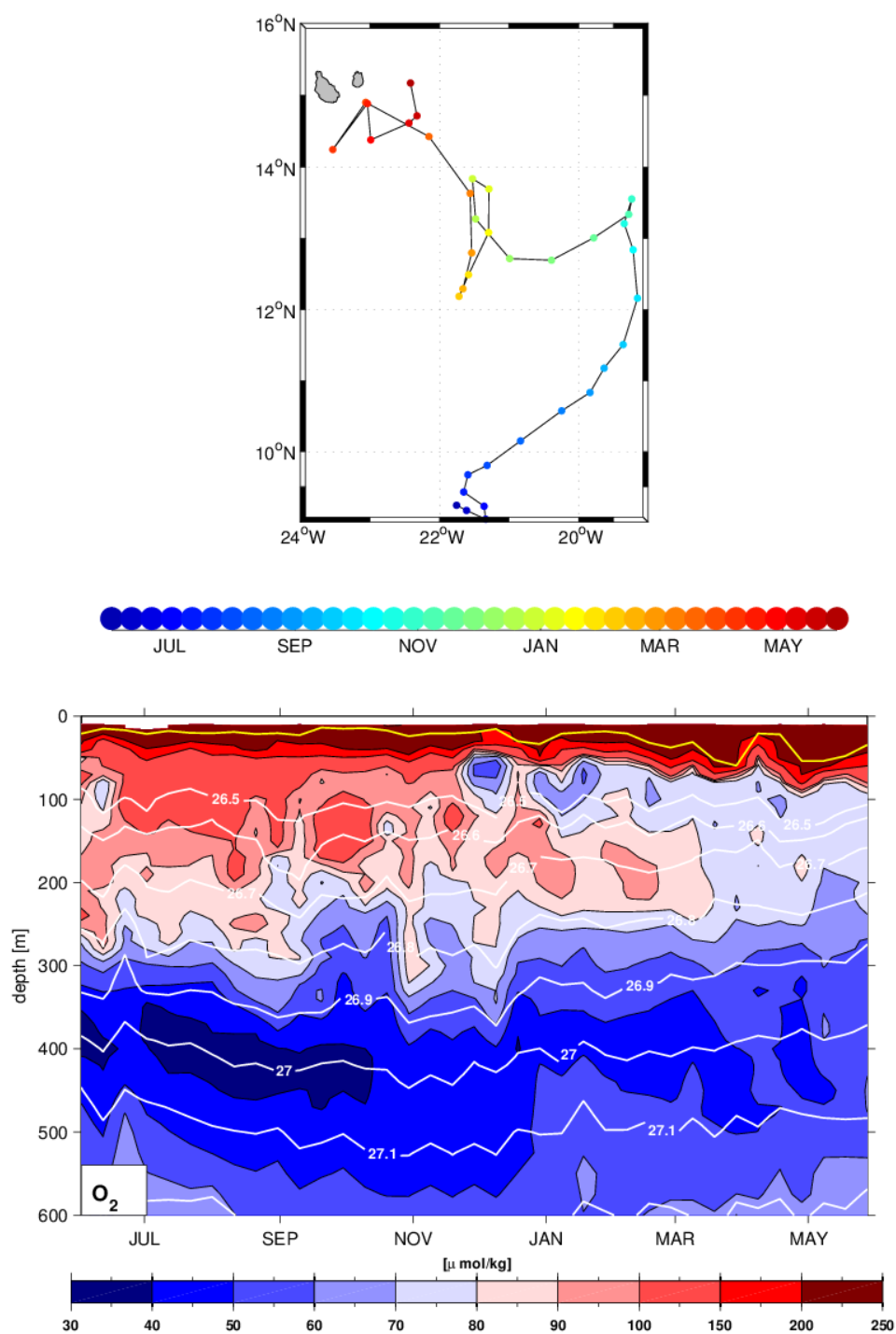


Fig. S4. Measurements of float f350 in the tropical eastern North Atlantic between June 2009 and May 2010 with float path (color coded) in time (top) and oxygen distribution in $\mu\text{mol kg}^{-1}$

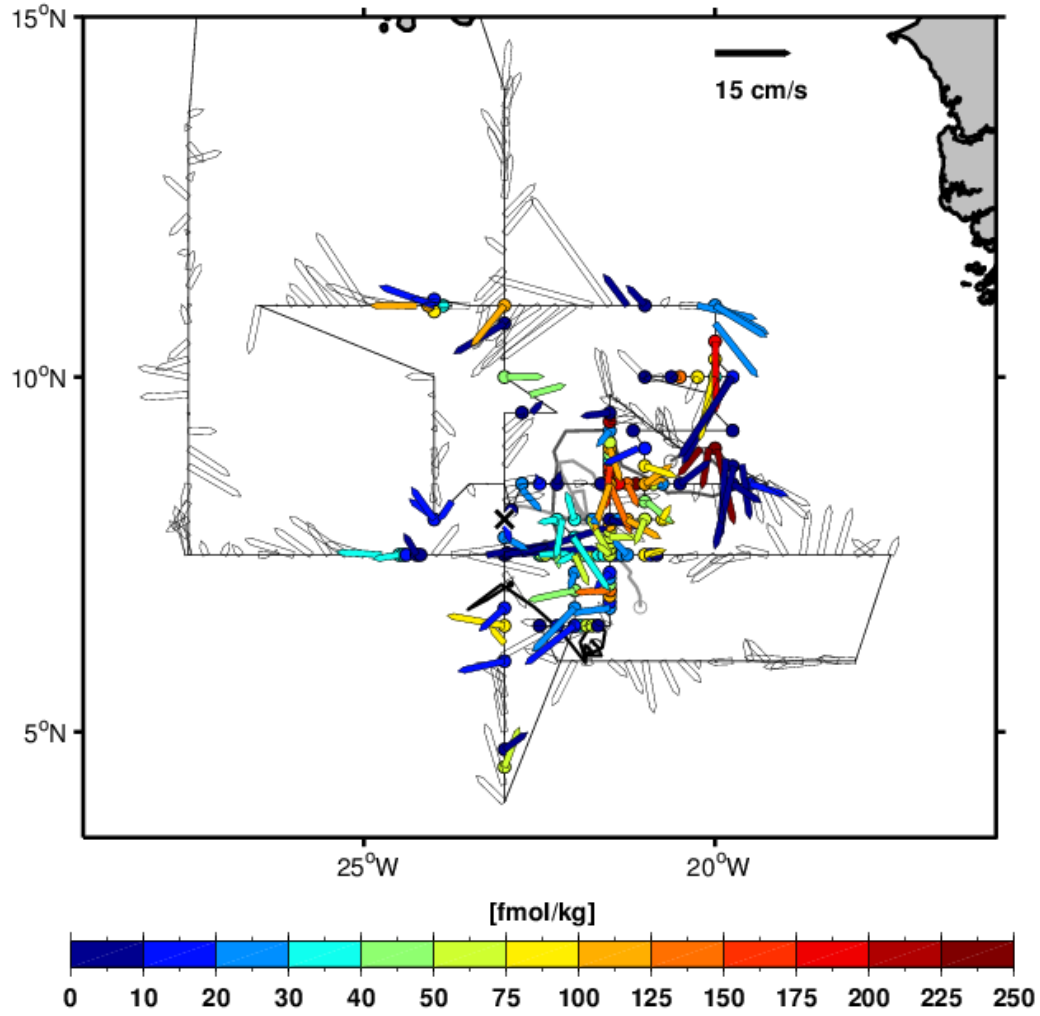


Fig. S5. Horizontal distribution of ADCP velocity vectors converted to the isopycnal $\sigma_\theta = 26.88 \text{ kg m}^{-3}$ recorded in November/December 2008 with current vectors interpolated on 0.25° intervals colored with the maximum tracer (CF_3SF_5) concentration (in fmol kg^{-1}) of the nearest CTD bottle measurements near this isopycnal. Open arrows only show velocity information because no tracer was sampled. The black x at $\sim 8^\circ\text{N}$, 23°W shows the deployment location where the tracer and the three floats were deployed in April 2008. The three float tracks for the period April 2008 to 4 December 2008 are included as black and grey curves with a circle for the December 2008 location. Please note that the tracer color scale and the area shown are different to the figures 10 and 11.

1 **Supplementary movie M1 ([ssh_float_atl.mp4](#))**

2 Sea surface height anomaly (SSHA) in cm between 28 April 2008 and 17 April 2012 (color)
3 interpolated on the days of each float surfacing and related location of the 3 floats when active
4 and surfacing (large dots; black float 6900524, green float 6900525, blue float 6900629; see
5 Table 1) with the last 2 surfacing locations shown as small dots connected by a line. The
6 Meteor cruise M80/1 and M80/2 CTD stations in November and December 2009 in relation to
7 the SSHA are shown as white circles summed up during the entire cruise period with thick
8 white circles for the CTD stations of the period of the SSHA figure and with small white
9 circles for the past periods.

10