

## 1. Observations

This study follows a finite amplitude meander of the Kuroshio Extension before it separates to form a cyclonic cold core ring.

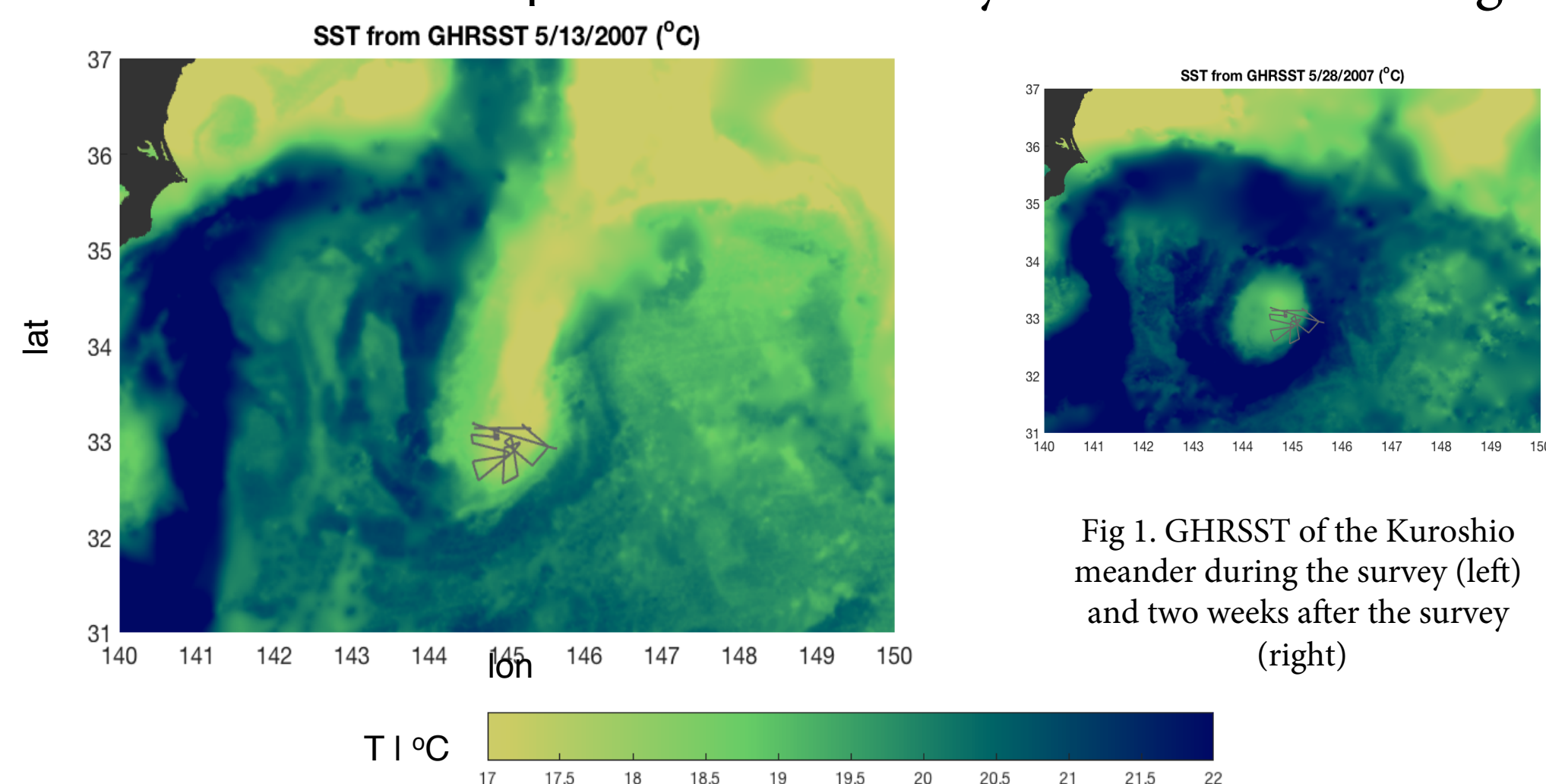


Fig 1. GHRSSST of the Kuroshio meander during the survey (left) and two weeks after the survey (right)

Two neutrally buoyant, subsurface Lagrangian floats were deployed in center of the meandering jet as a part of the Office of Naval Research Assessing the Effect of Submesoscale Ocean Parameterizations (AESOP) program. The floats' trajectories were acoustically tracked for three days, allowing the region surrounding the drifting floats to be intensely surveyed by a ship towing a Triaxus profiler. The survey provides fourteen high resolution cross sections of the velocity and scalar fields surrounding the float up to a depth of 150m.

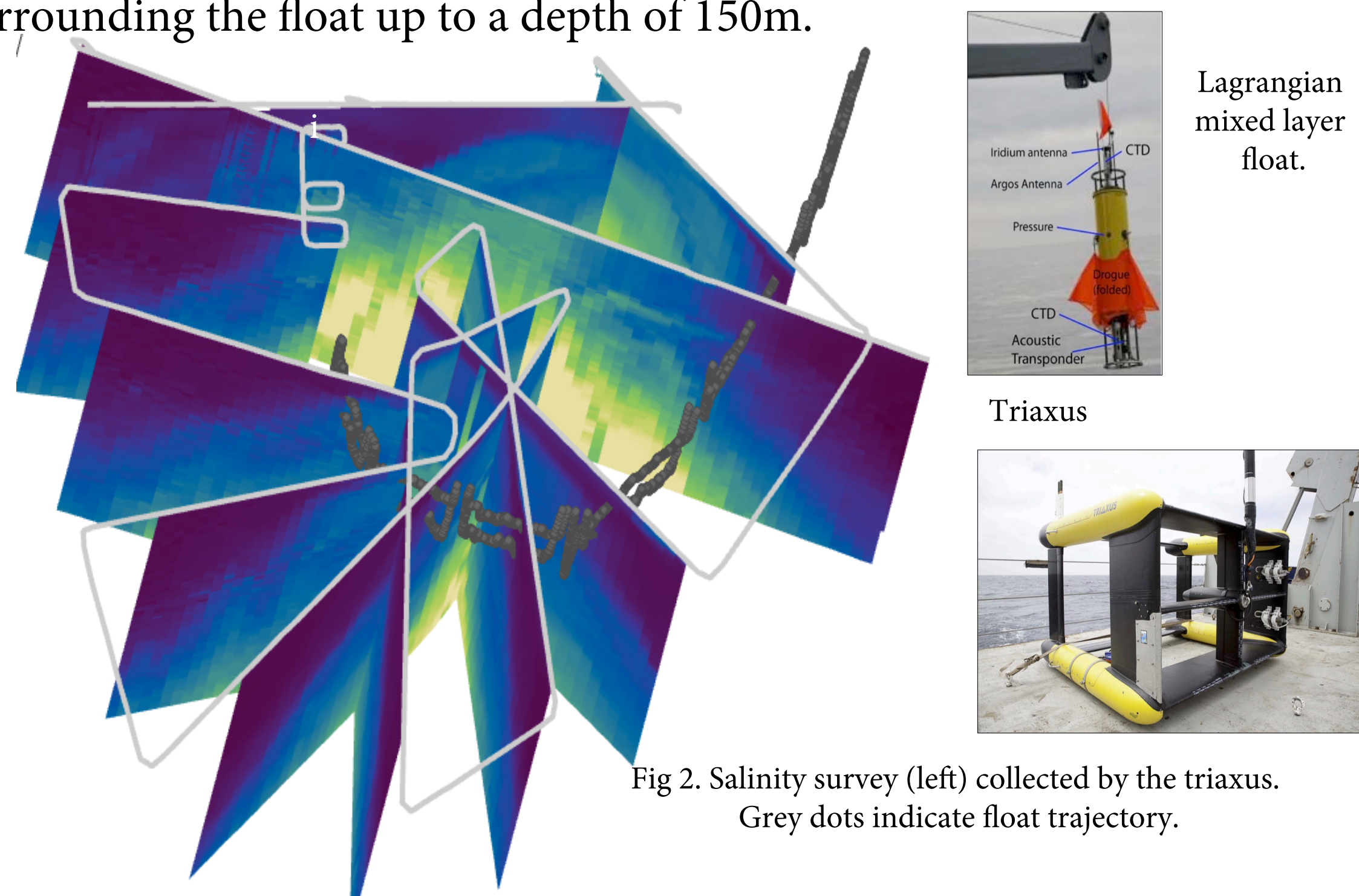


Fig 2. Salinity survey (left) collected by the triaxus. Grey dots indicate float trajectory.

## 2. Subtropical Mode Water (STMW)

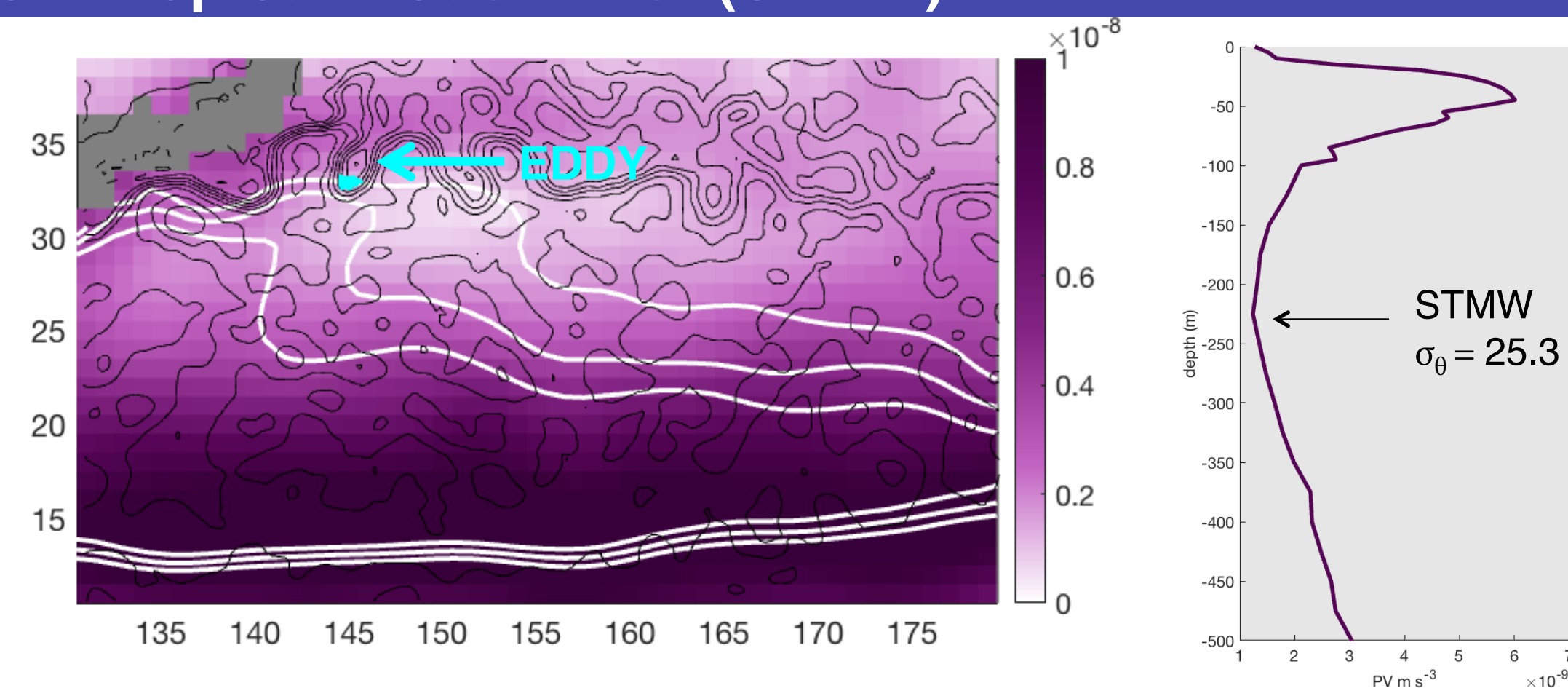


Fig. 3 (right) PV from WOA. May.  $z=225\text{m}$ . White contours are  $\sigma_\theta = 25.2\text{-}25.4$ , the density class of STMW. (left). Profile of PV in formation region. May. The minimum in PV corresponds to STMW.

Meandering eddy in region of STMW formed in previous spring by rapid capping off of winter mixed layer (Suga et al. 1990, Nagano et al. 2016).

**HOW WILL THIS EDDY INTERACT WITH STMW?**

## 3. Biogeochemical Properties of $\sigma_\theta = 25.3\text{kg/m}^3$ within eddy

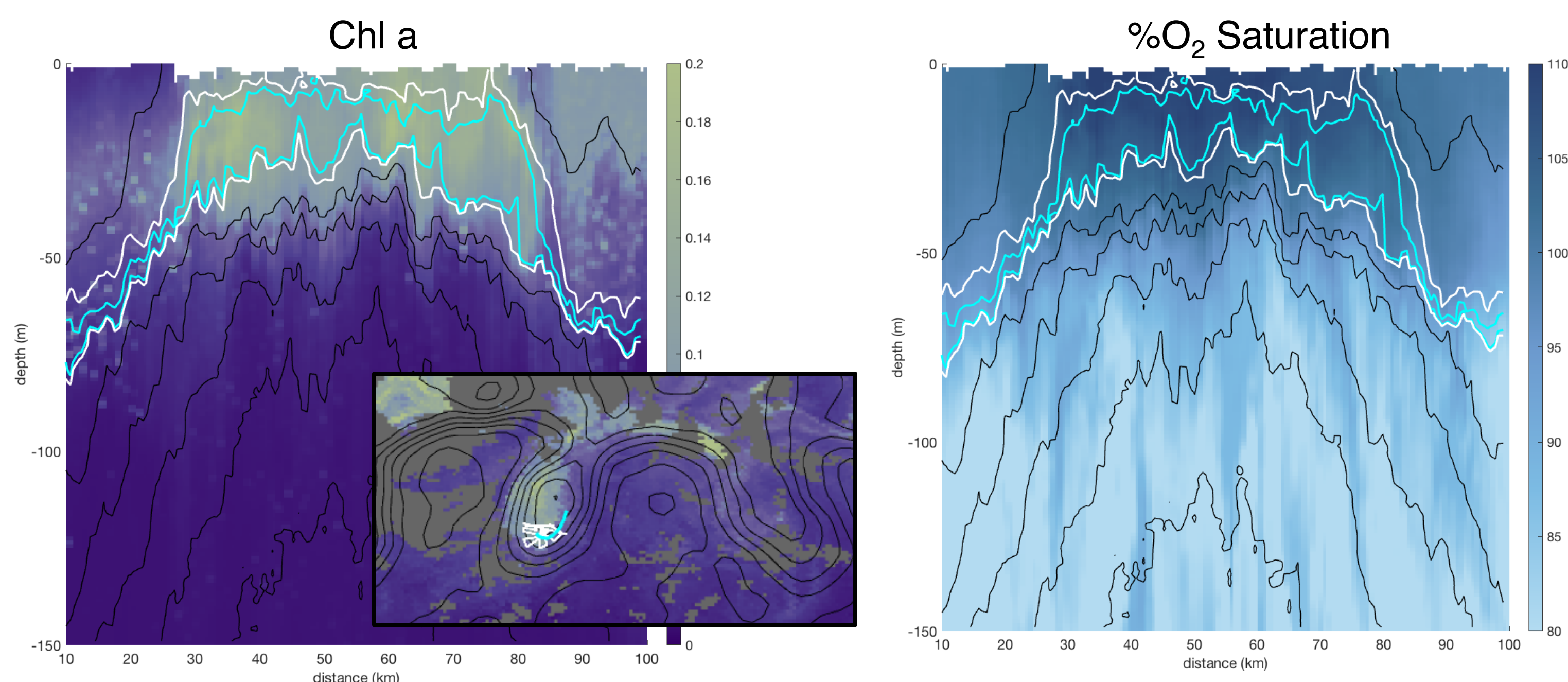


Fig 4. Transect of chl a (right) and %O<sub>2</sub> saturation (left) from one Triaxus transect. White lines outline STMW 25.2-25.4. Cyan lines are isopycnals occupied by the Lagrangian floats.

The sharpest front of the eddy (where the two floats were placed) shares the same density class as the STMW. This density class within the eddy is transporting cold, fresh, high Chl a, high O<sub>2</sub> water into the subtropical gyre.

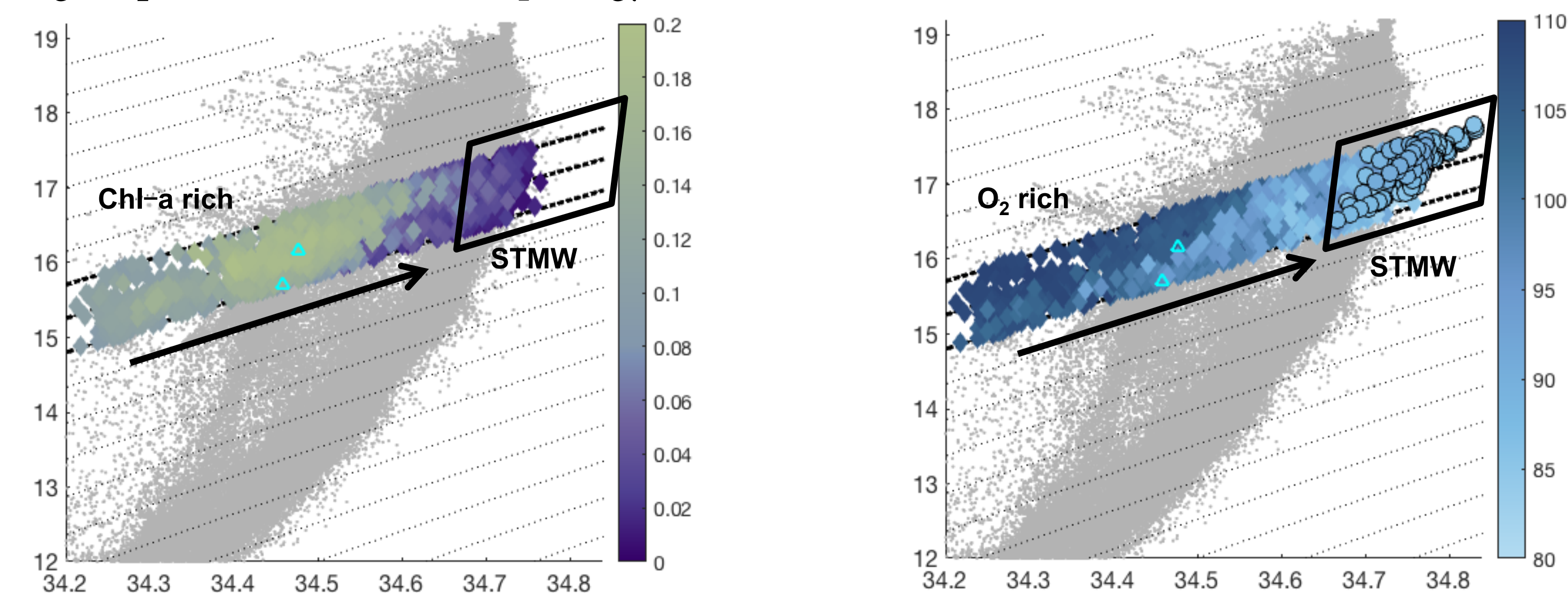


Fig 5. TS diagrams. Grey dots are all triaxus data. Colored diamonds are triaxus Chl a (right) and %O<sub>2</sub> saturation (left) within  $\sigma_\theta = 25.2\text{-}25.4$  (dashed lines). Circles are %O<sub>2</sub> saturation in the 225m STMW region from WOA in Fig 3.

## 4. Dynamics

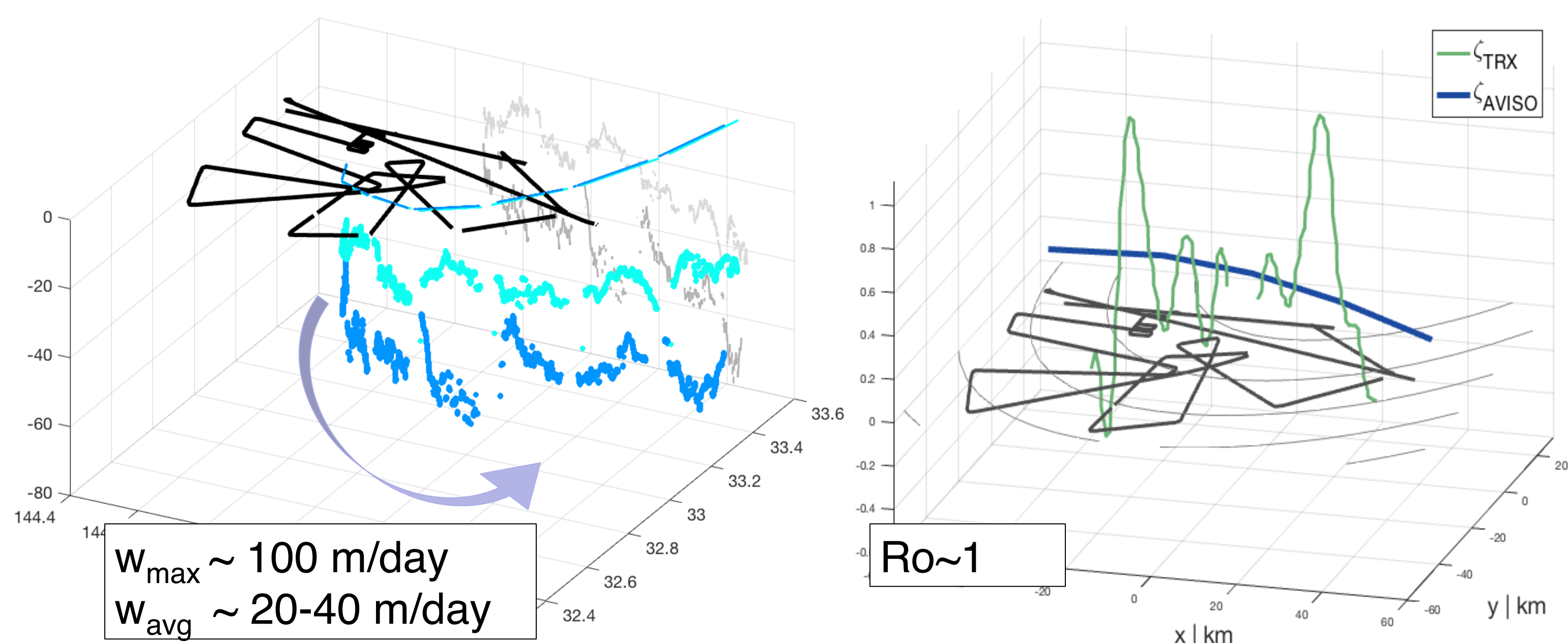


Fig 6. Survey ship track in dark grey. (right) Float depth (blue dots). (left) Relative vorticity ( $\zeta$ ) calculated from AVISO vs. triaxus

Both floats continuously downwell as they wrap around the eddy. Relative vorticity reaches  $\sim 1\text{f}$ . Both of these suggest highly localized dynamics that may act to hasten the along isopycnal transport between the eddy and the underlying mode water.