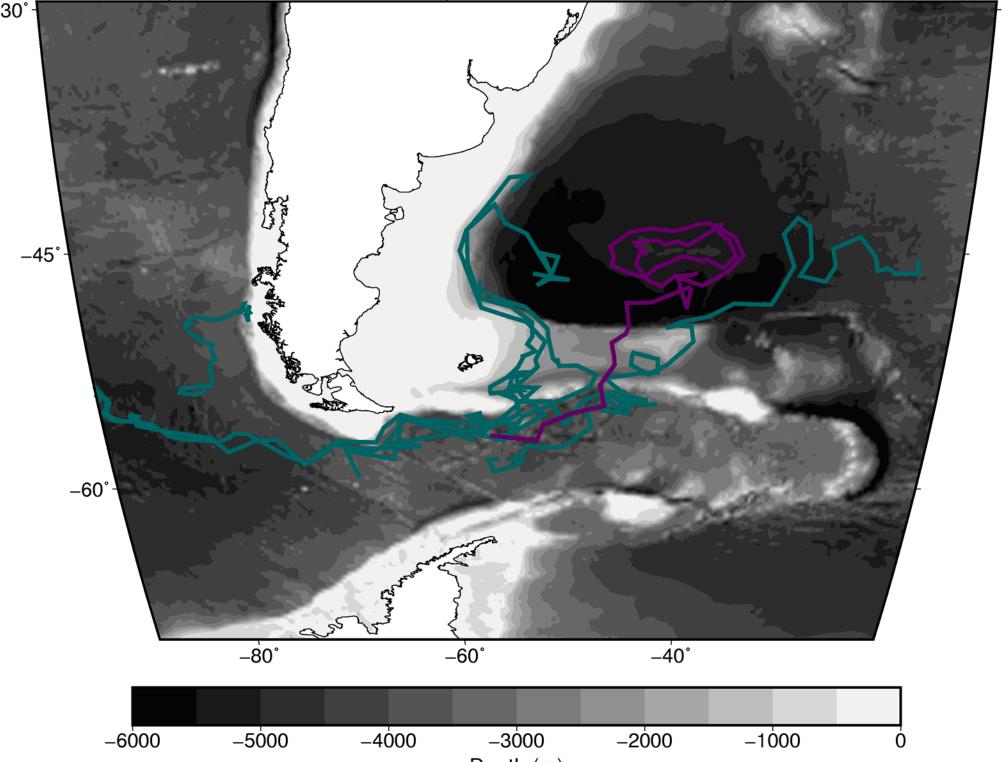
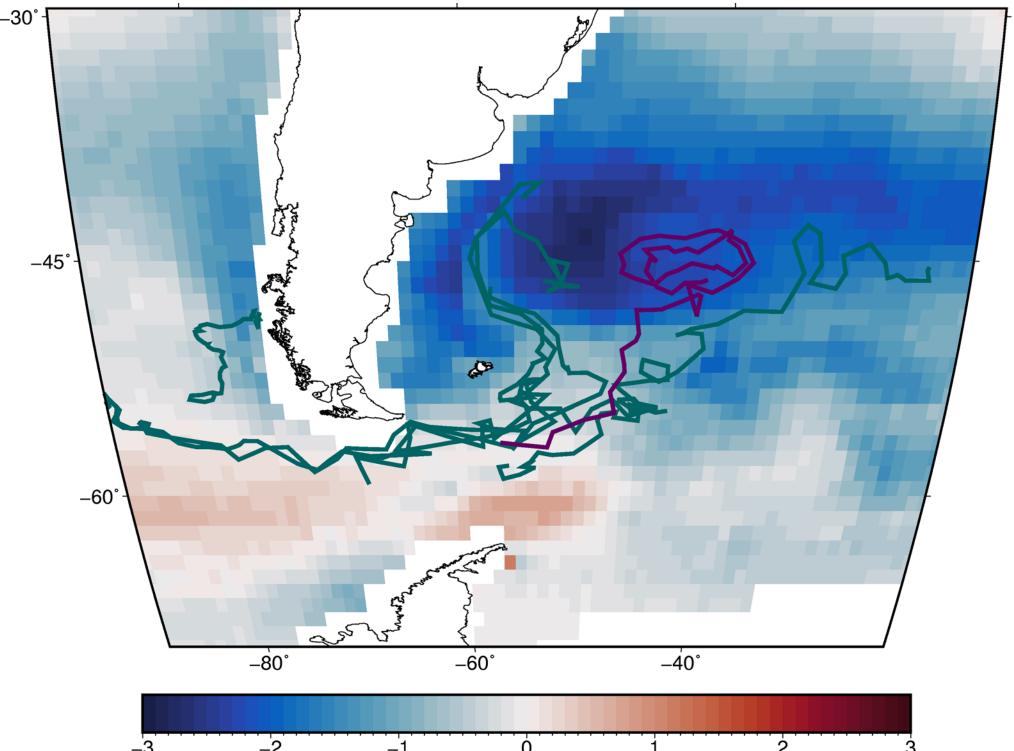
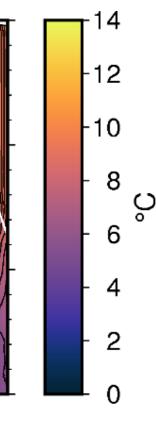
UPTAKE IN THE ZAPIOLA ANTICYCLONE Alison R. Gray, School of Oceanography, University of Washington Potential Temperature 500· e (db) O ର୍ଷ 1000[.] 200 1500 2016 to September 2017. Jan Apr Ĵul Óct Ápr Jul 2016 34.8 500 e (db) -34.4 ¥ ס 1000 200 -34.2 1500 -34.0 Jan Ápr Jul Óct 2016 Ápr Jul 2017 Jan Apr 2017 2016 Nitrate this anomaly. 500 (qp) 1000-15 Å -40° 200 \sim 1500-E -3⁰00 -2000 -1⁰00 -4000 Depth (m) Ápr 2017 Jan Apr Jul Oct 2016 Ápr Jul 2017 Óct Jan Jan 2016 AOŲ 120 100 500 ⁵⁰⁰ ssure (dp) 1000-000 60 <u>S</u> -6 40 un sea 200 20 -8 1500-Air Jul16 Jan17 Jan16 Jan Apr Óct Ĵul Ápr Jul Oct 2016 2016 pН -8.1 References 500-(qp) 100 *Oceanogr.* 25, 329–347. 8.0 ≒ sure 1000-200 -7.9 *Methods* 14, 268–277. –40° 1500-104, 21137–21149. . 2016 Óct Ápr Jul Jan Ápr Air-sea CO_2 Flux (mol m⁻² y⁻¹) 2017 2016 2017

The Zapiola Anticyclone is a counterclockwise circulation feature associated with the Zapiola Rise, a sedimentary deposit located near the Brazil-Malvinas Confluence region (de Miranda et al. 1999). This strongly barotropic flow has been estimated to be 100 Sv (Saunders and King 1995). Despite being located in a region with significant carbon biogeochemical cycles is largely unknown.

PROFILING FLOAT OBSERVATIONS OF ENHANCED CARBON uptake, the impact of this feature on air-sea CO₂ fluxes and Bottom depth and trajectories of biogeochemical floats in the region -5000Annual mean air-sea CO₂ flux from Landschützer et al. 2015 -45° -60° -2



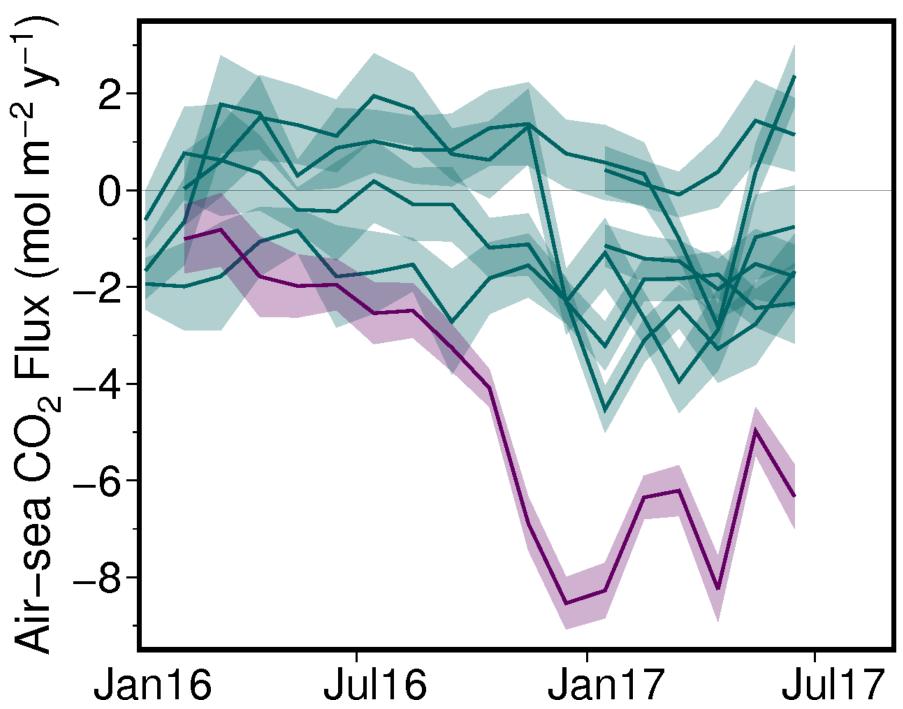




Several biogeochemical profiling floats have been deployed in this region by the Southern Ocean Carbon and Climate Observations and Modeling (SOCCOM) project, measuring temperature, salinity, oxygen, nitrate, and pH in the upper 1800 m. One of these floats (WMO ID 5904657) was trapped in the Zapiola Anticyclone from August

The pH data were combined with an empirical estimate of total alkalinity (Carter et al. 2016) to estimate seawater pCO_2 . These estimates were then used together with atmospheric CO_2 observations and atmospheric reanalysis data to estimate air-sea fluxes (Gray et al. submitted).

The float trapped in the Zapiola Anticyclone showed significantly stronger fluxes into the ocean than all of the nearby floats. This result is being investigated further to understand the causes of



Saunders, P. and King, B. A., 1995. J. Phys. Gray, A. R. et al., submitted. *Nature*. Carter, B. et al., 2016. Limnol. Oceanogr.

de Miranda, A. P. et al., 1999. J. Geophys. Res.