

Supplemental figures.

1 Water property distributions along I08 in 2019

The water property distributions obtained in our cruise were shown in Figure S1.

2 Changes in shallow layers to capture the detailed changes

The water property changes including the intermediate layers (up to 1000 dbars) on isobar (corresponding to Fig.2) and isopycnal (corresponding to Fig. 3) surfaces in the shallow layers (0-500 dbars) along I08 section were shown in Figures S2 and S3, respectively. Figure S4 showed the weak the vertical gradients of the water properties in the intermediate layers (corresponding to Fig.4). Figure S5 (corresponding to Fig.5) showed the salinity changes based on the Argo float array gridded data. The interannual and seasonal isopycnal heaving effects on the water property changes seemed to be small in the upper layer in Fig S6 (corresponding to Fig. 11). Figure S7 and S8 (corresponding to Figs. 12 and 13) showed that there were some similarities and differences in the intermediate layers in comparison with Figures S2 and S3.

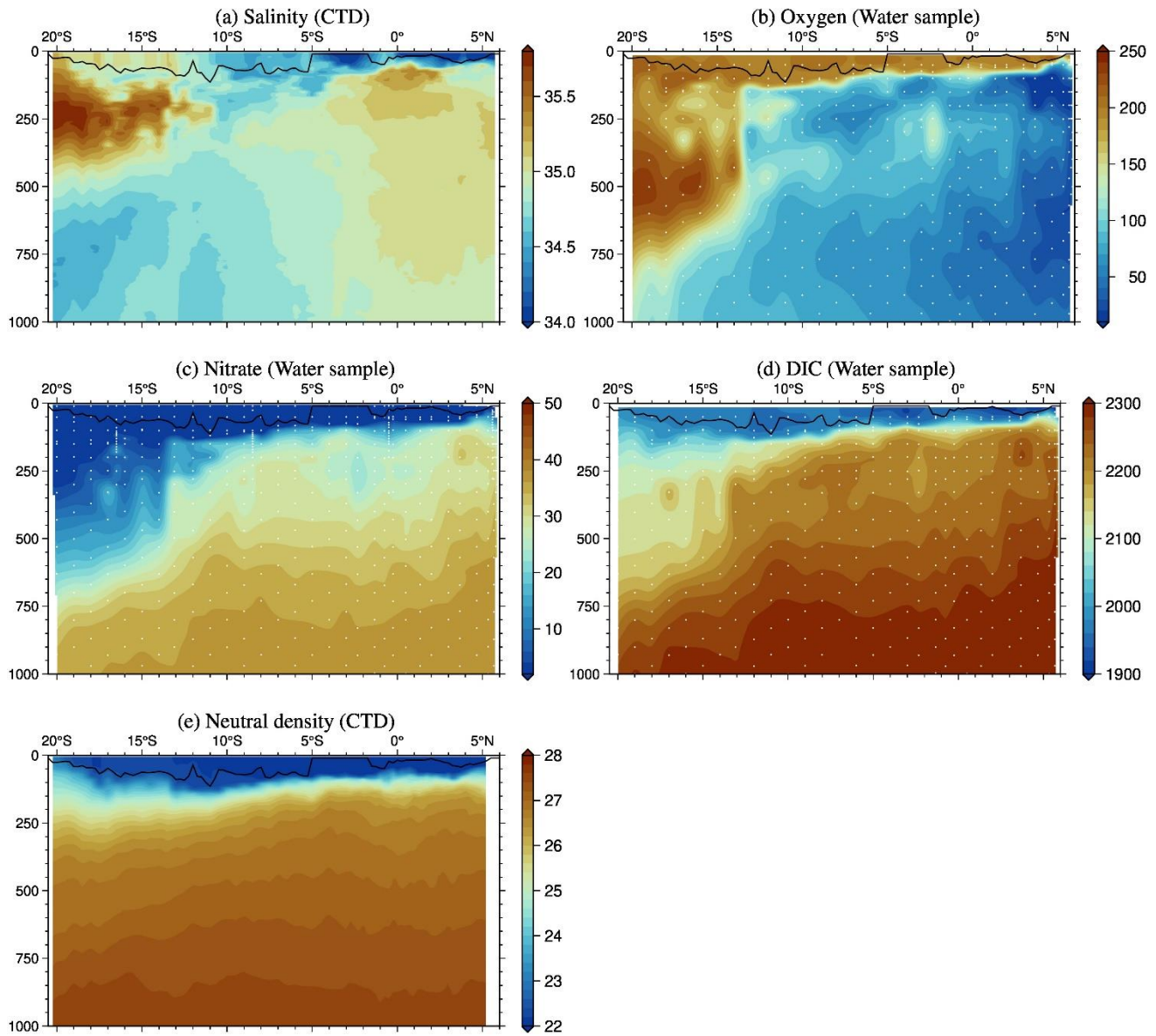


Figure S1. Salinity (a), DO (b; $\mu\text{mol kg}^{-1}$), nitrate (c; $\mu\text{mol kg}^{-1}$) DIC (d; $\mu\text{mol kg}^{-1}$), and neutral density (e; kg m^{-3}), measurements along the I08 section in 2019 with CTD sensor and water sampling. Mixed layer depths defined as the ones where the densities were denser than by 0.125 kg m^{-3} at 10 dbar were shown by the black line. White dots (b, c, and d) show water sampling points.

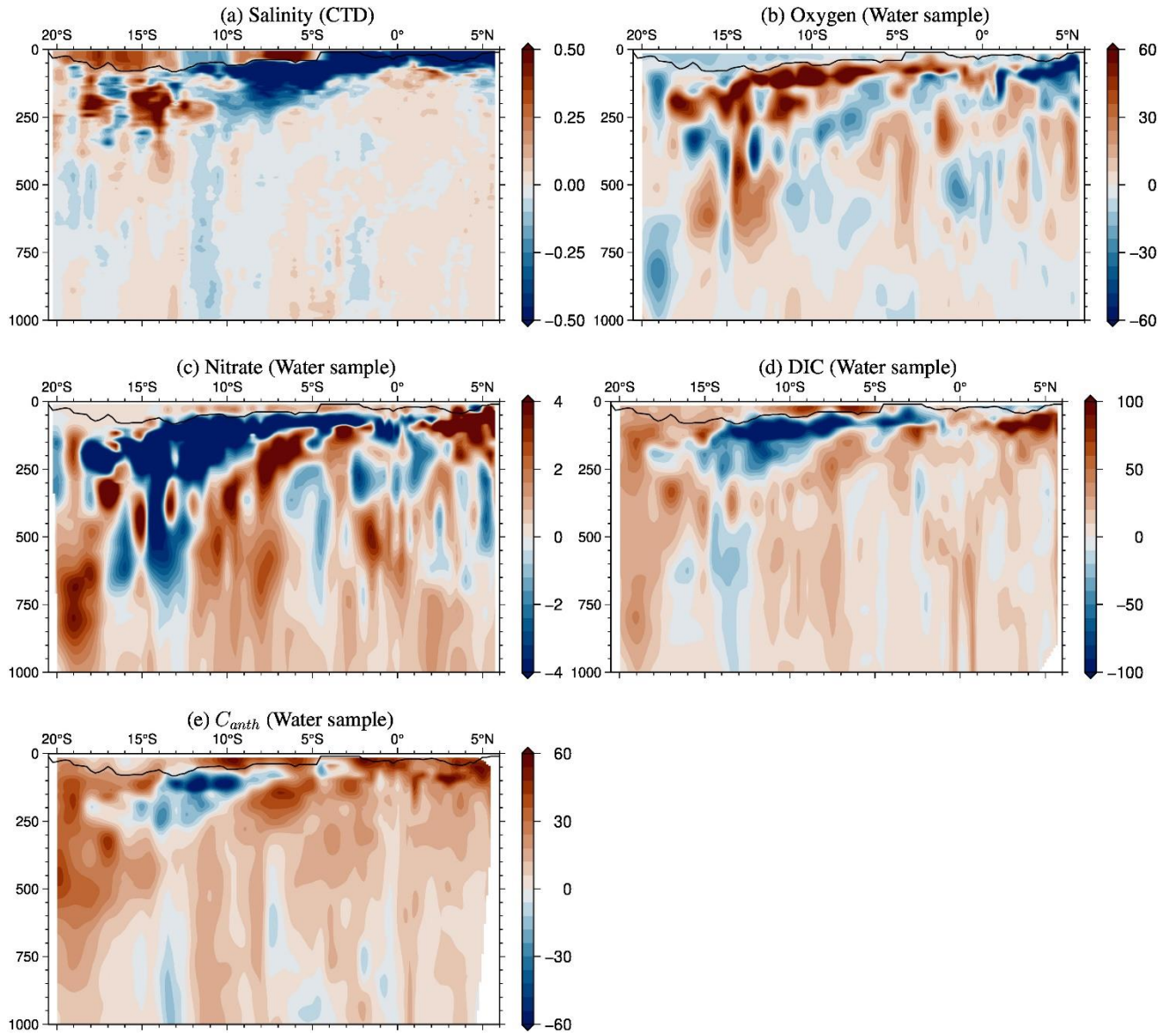


Figure S2. Same as Fig. 2 but for changes in the depths of 0 – 1000 dbars..

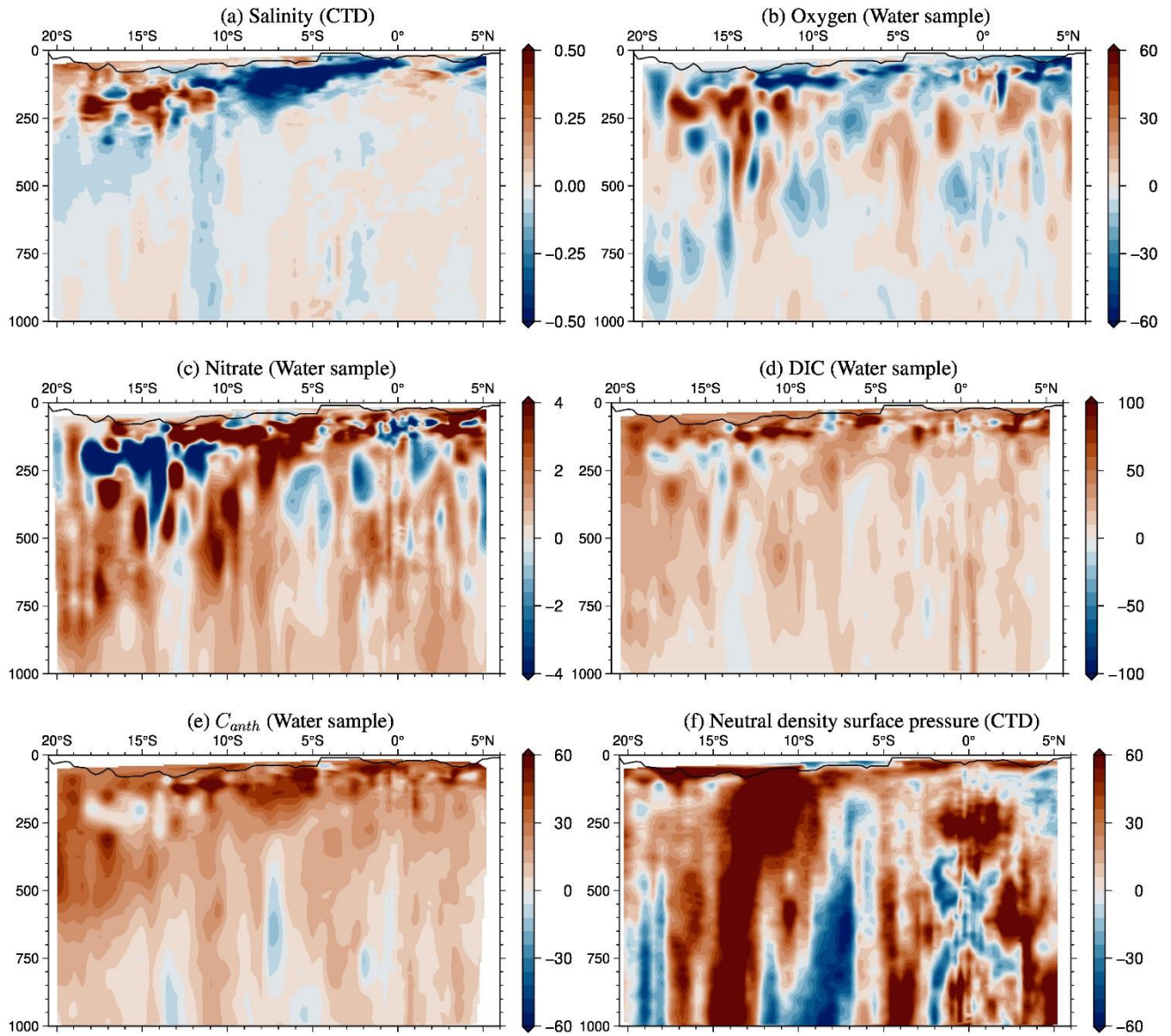


Figure S3. Same as Fig. 3 but for the changes in the depths of 0–1000 dbars..

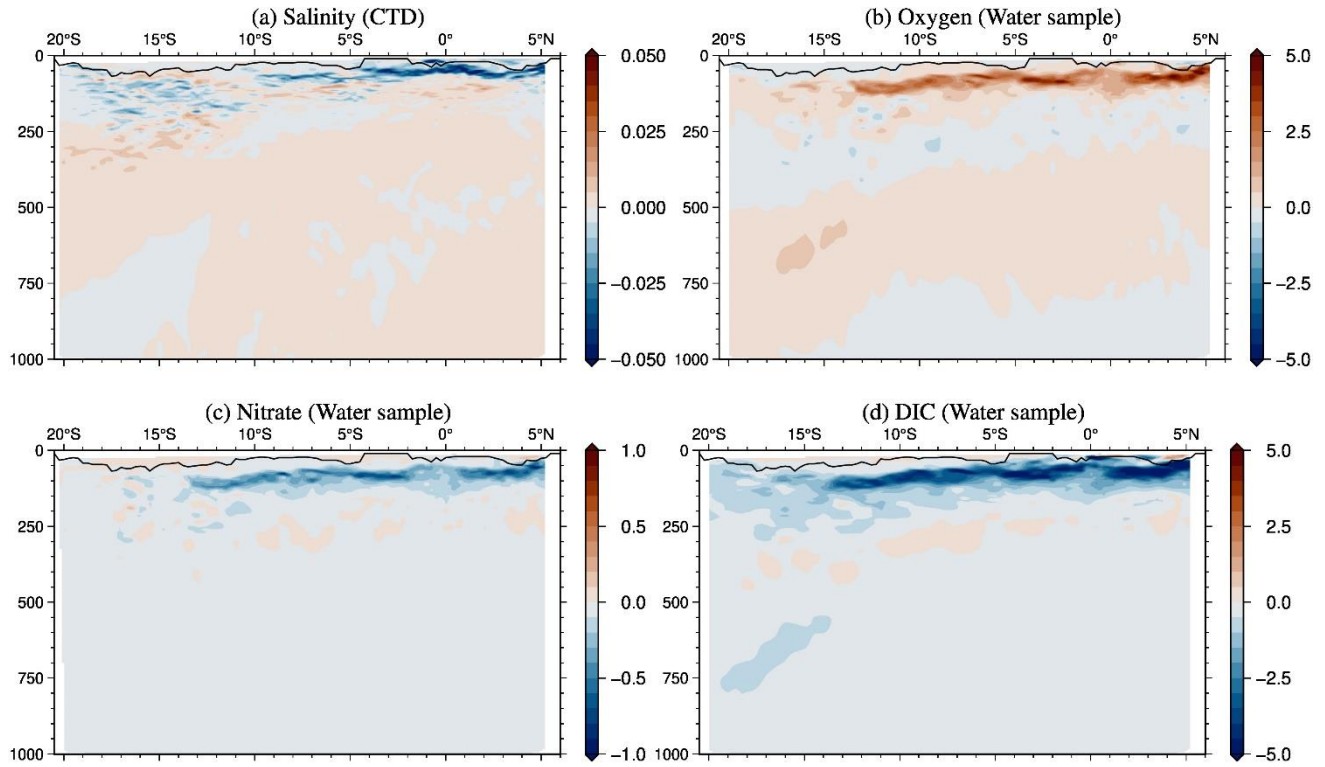


Figure S4. Same as Fig. 4 but for the vertical gradients in in the depths of 0 – 1000 dbars..

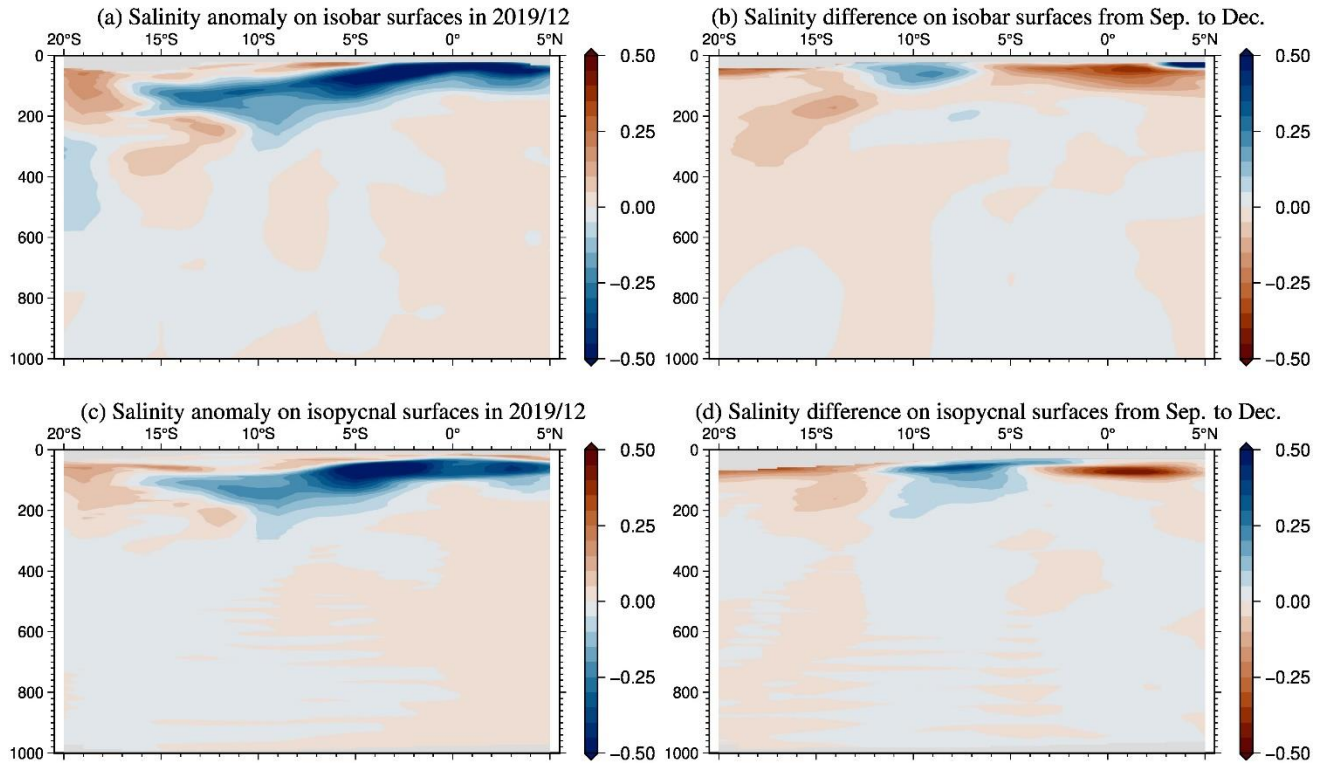


Figure S5. Same as Fig. 5 but for the changes in in the depths of 0–1000 dbars..

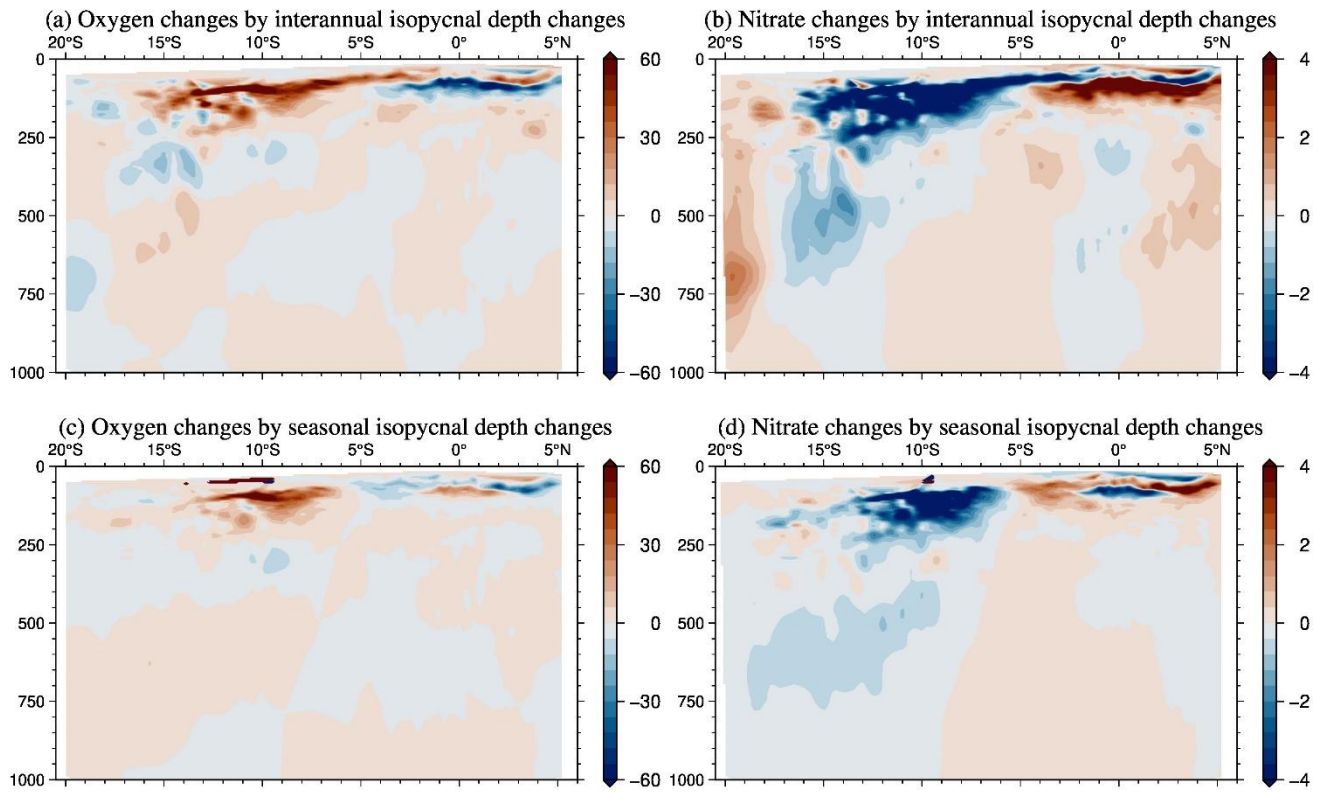


Figure S6. Same as Fig. 11 but for the changes in the depths of 0 – 1000 dbars.

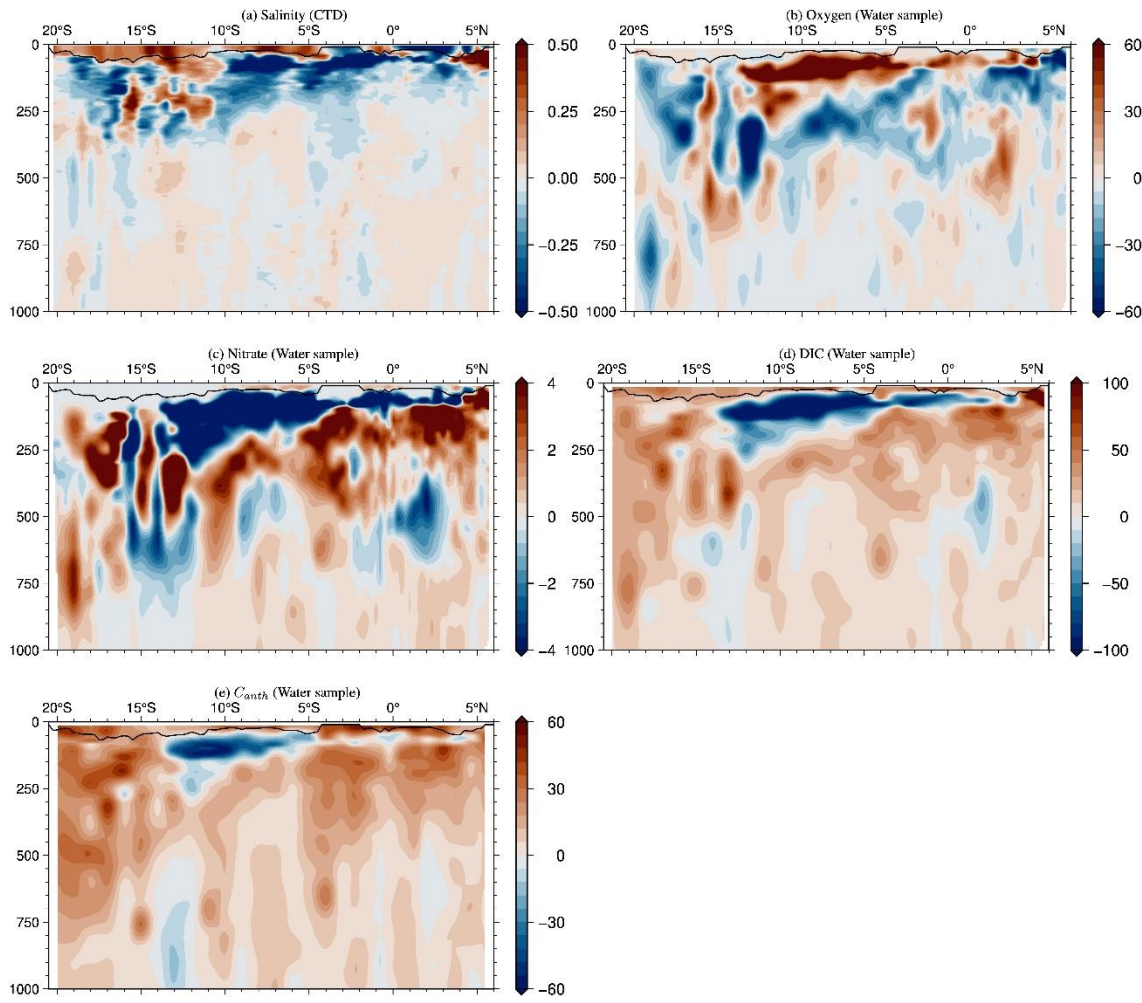


Figure S7. Same as Fig. 12 but for the changes in the depths of 0 – 1000 dbars.

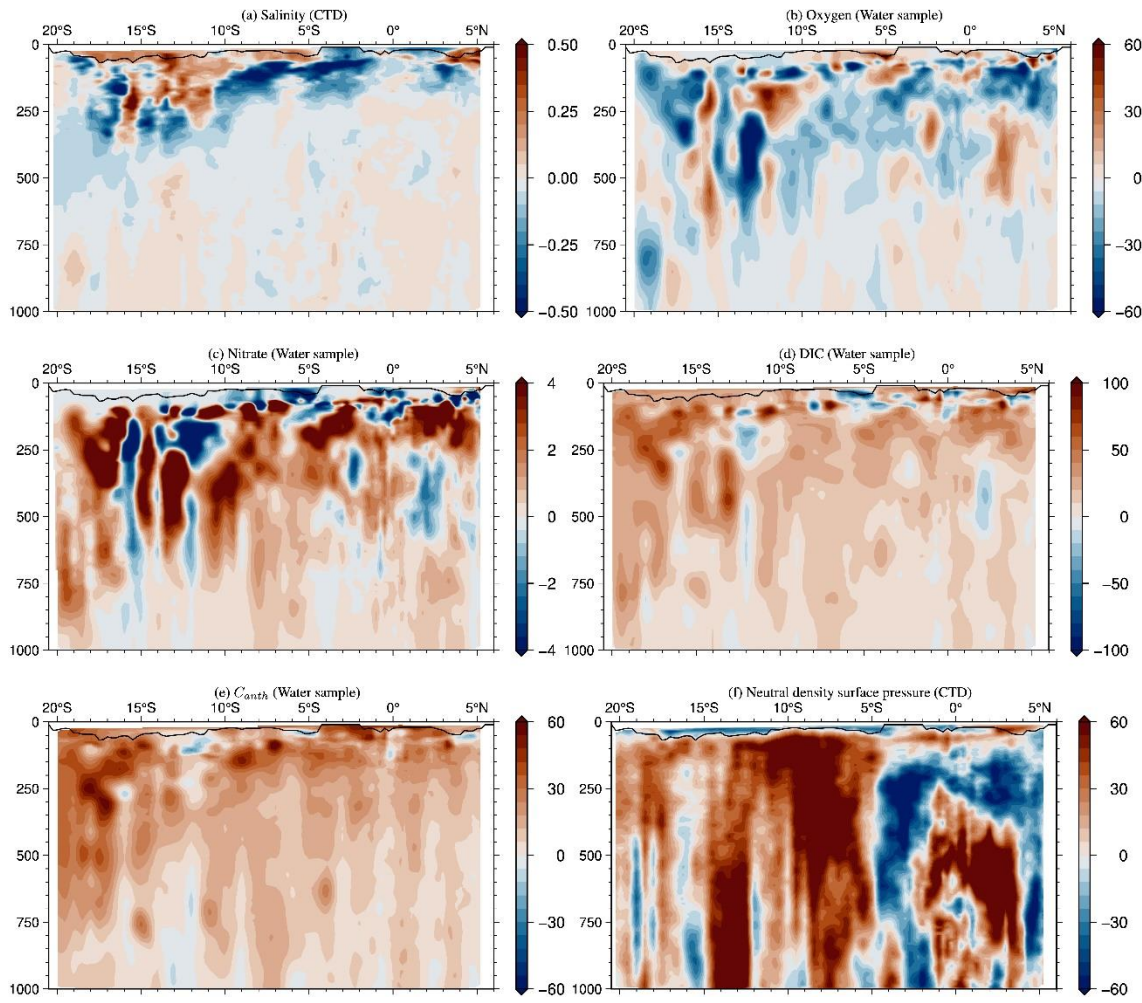


Figure S8. Same as Fig. 13 but for the changes in the depths of 0 – 1000 dbars.