Fig. S1. Sectional distributions of temperature (℃) and salinity (psu) in the upper 200 m layer in the study area. Transect 1: temperature (a, ℃), salinity (b, psu); Transect 2: temperature (c, ℃), salinity (d, psu); Transect 3: temperature (e, ℃), salinity (f, psu)
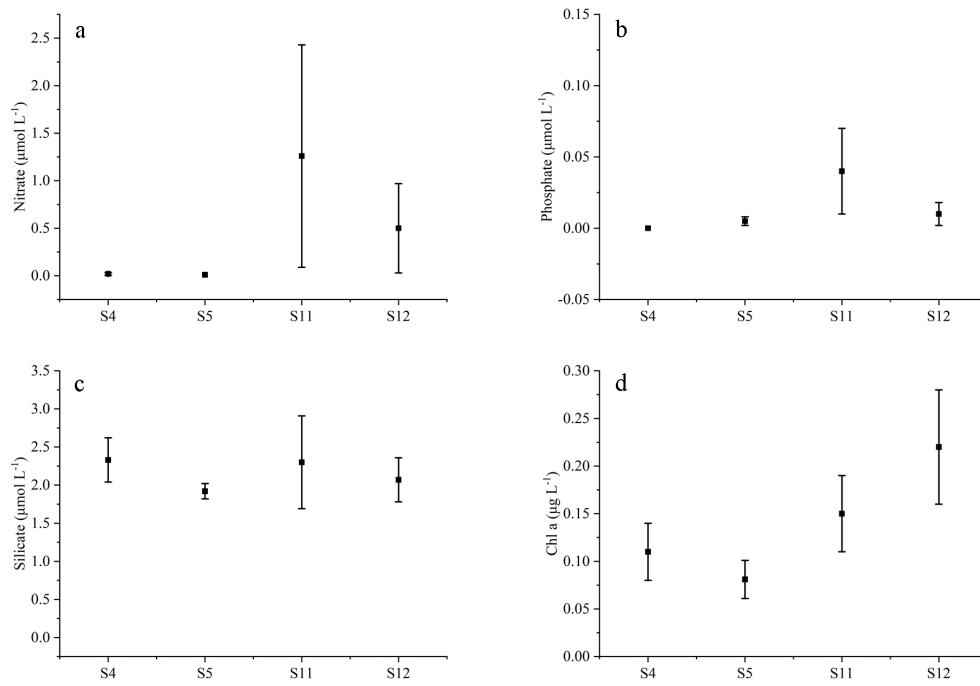
Fig. S2. Mean concentrations of nutrients and Chl *a* in the upper 50 m water layer at stations located in the anticyclonic eddy region (S4, S5) and cyclonic eddy region (S11, S12). a: nitrate (μ mol L^{-1}); b: phosphate (μ mol L^{-1}); c: silicate (μ mol L^{-1}); d: Chl *a* (μg L^{-1}).
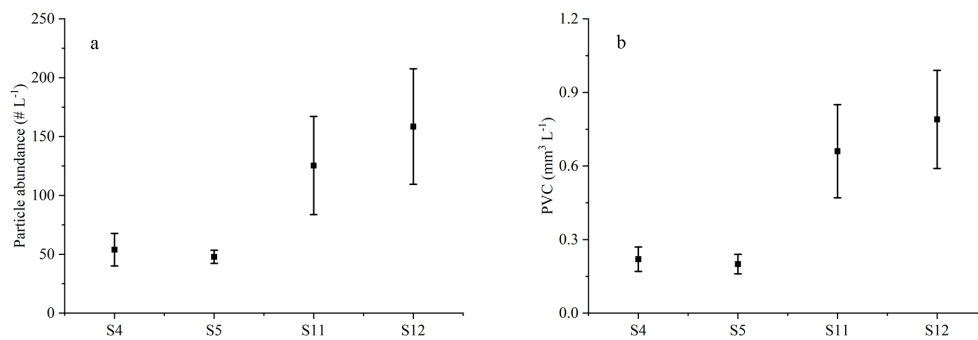
Fig. S3. Mean concentrations of particle abundance (a) and PVC (b) in the upper 50 m water layer at stations located in the anticyclonic eddy region (S4, S5) and cyclonic eddy region (S11, S12).
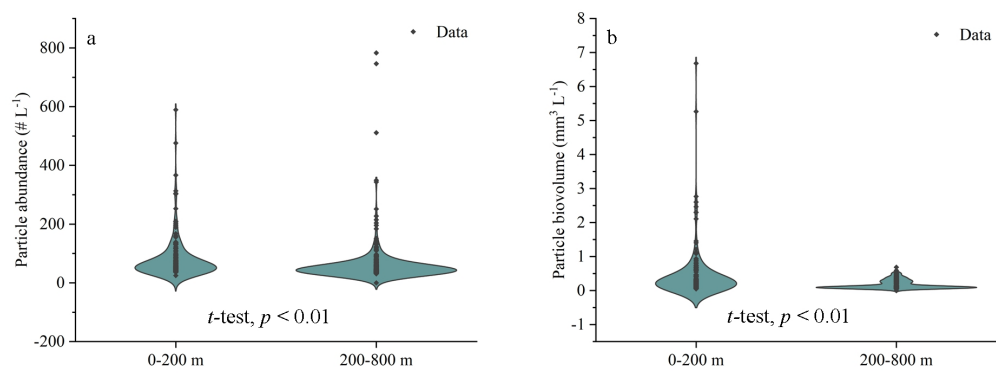
Fig. S4. Comparison of particle abundance (# L^{-1}) and PVC (mm^3 L^{-1}) between shallow waters
(0–200 m) and deep waters (200–800 m). a: abundance (# L^{-1}); b: PVC (mm^3 L^{-1}).
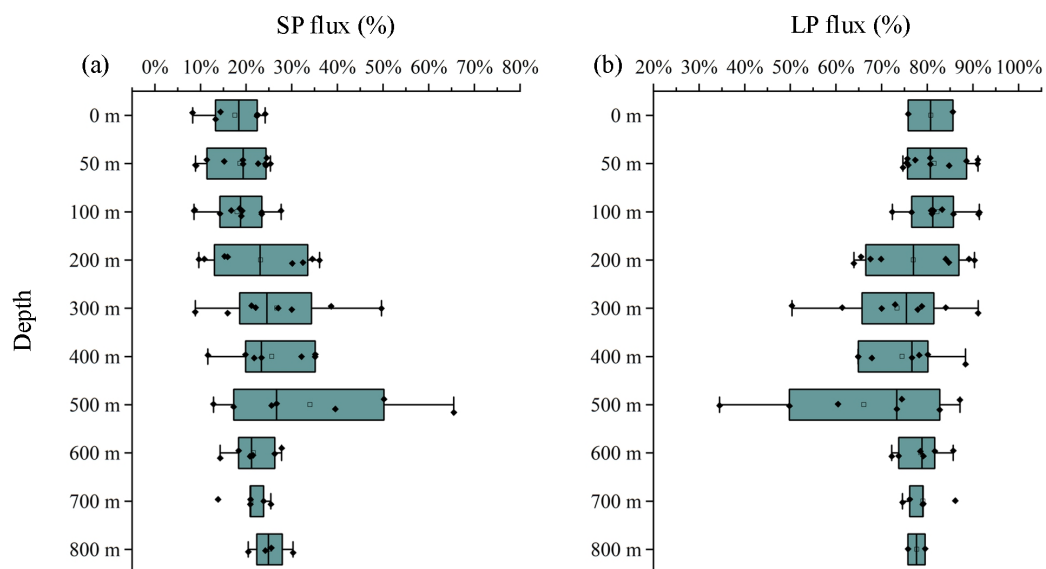
Fig. S5. Contribution of small and large particles to POC flux at different depths. Box plots show the median value (mid-line), the 25% and 75% quantiles (box), and the 5% and 95% quantiles (whiskers). SP: small particles; LP: large particles.