Supplementary Information

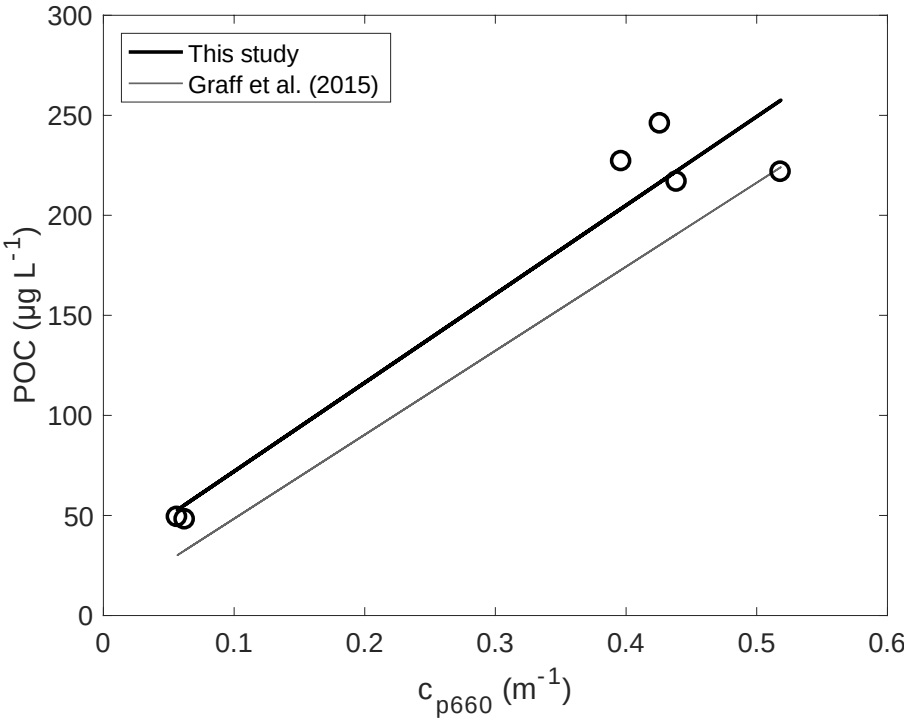

Figure S1: Particulate organic carbon (POC) concentration measured in 5 m CTD cast samples as a function of underway beam attenuation (c_{p660}) at 660 nm, measured within 5 minutes of the cast time. The five higher values were collected during drifter period 1, while the two lowest values were collected during the first day of drifter period 2. The best-fit linear regression of [POC] against c_{p660} is plotted relative to the linear regression reported in Graff et al. (2015).

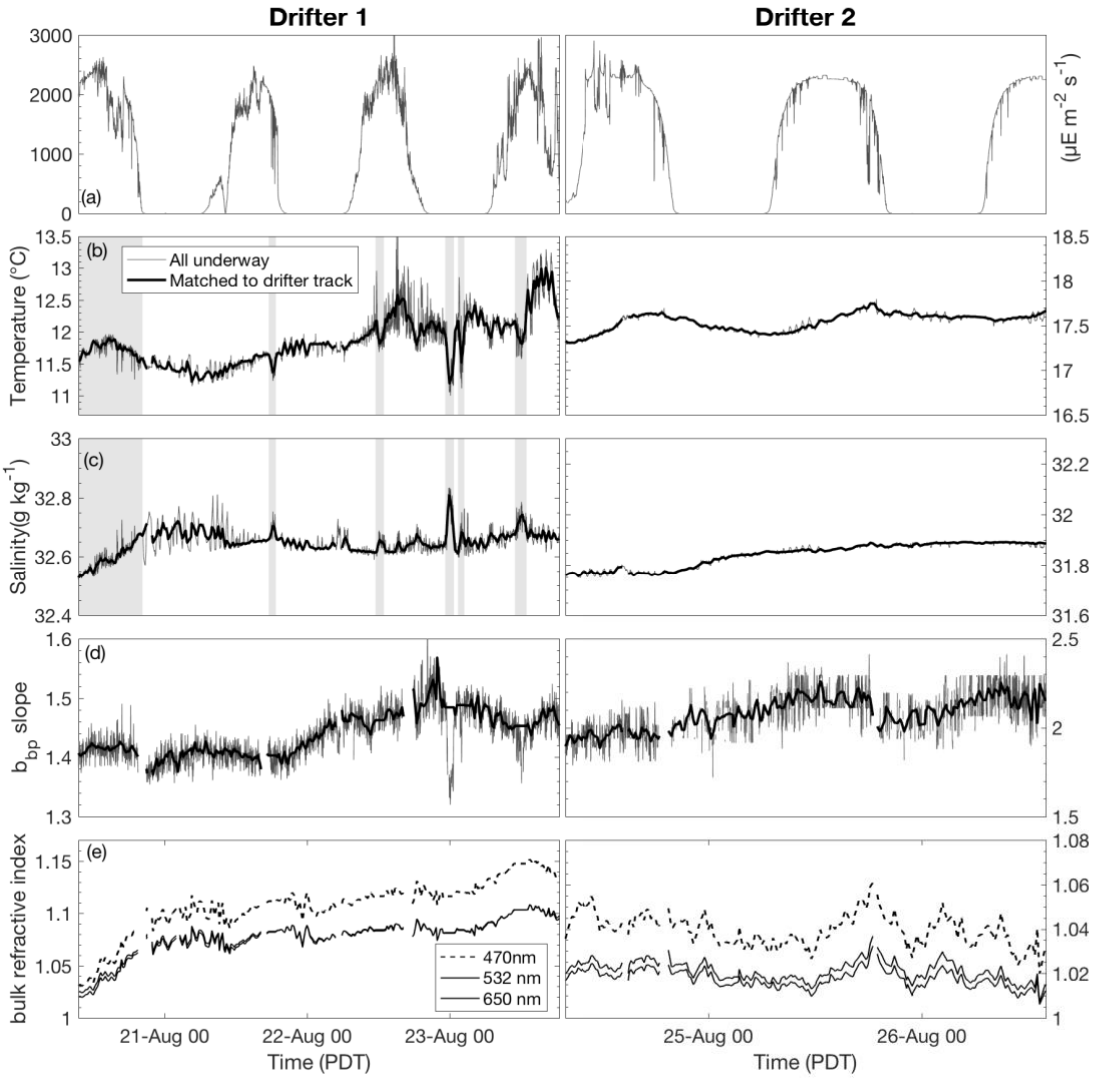

Figure S2: (a-c) Underway measurements of sea surface PAR, temperature, and salinity. Anomalous values, likely from intrusion of external water masses into the sampled drifter patch, are shaded. Underway observations from these periods were omitted from the data set. The brief decrease in PAR during the morning of 21 August was caused by a total solar eclipse. (d) The spectral slope of particulate backscatter (b_{bp}). (e) Bulk refractive index (η_p) at 470 nm, 532 nm and 650 nm.

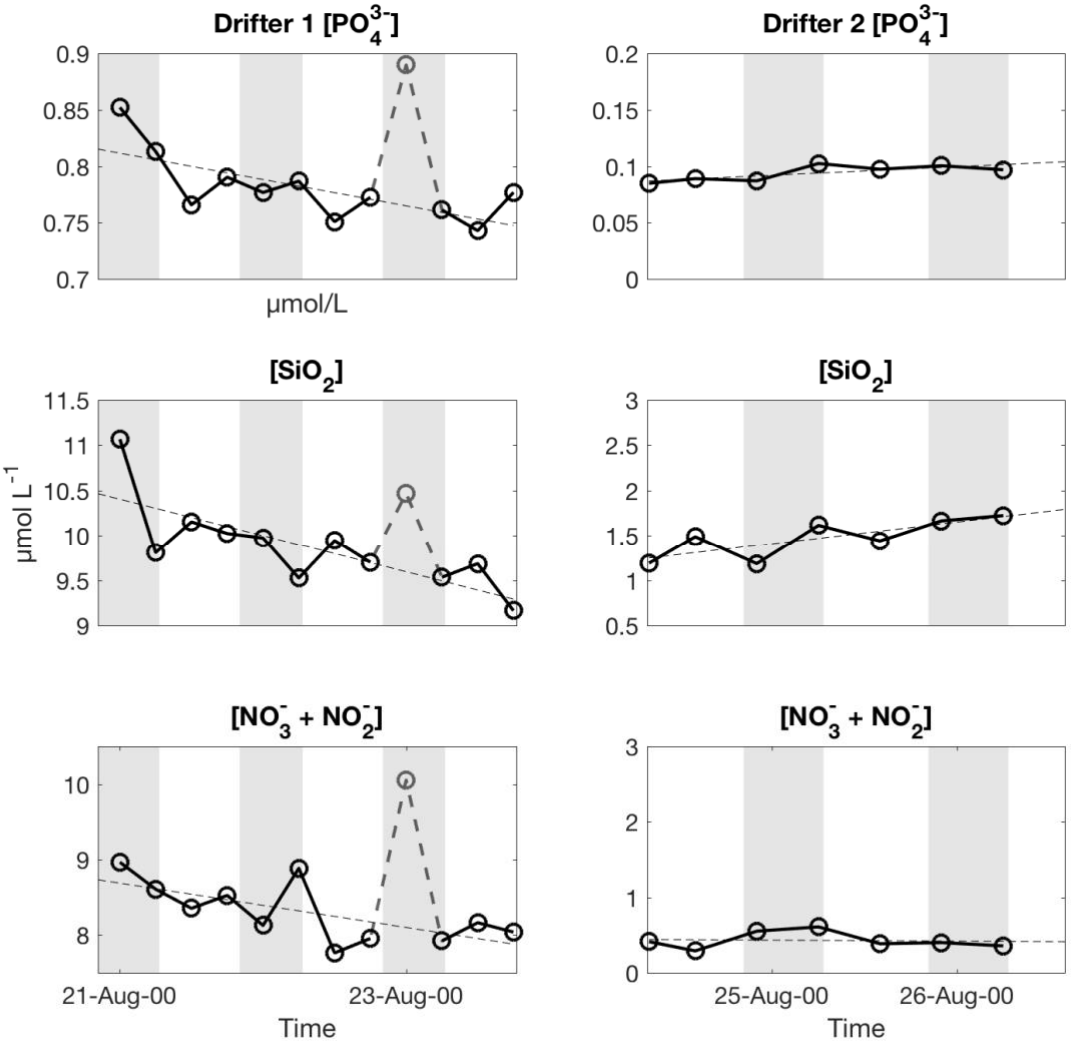

Figure S3: Nutrient concentration time series during both drifter periods. The gray point indicates an anomalously high value measured during an erratic CTD cast during the third night of drifter period 1. This data point was omitted from analysis. The dashed line is the best fit linear regression of each nutrient concentration against time. All regressions indicated significant changes ($p<0.05$), except for [NO3-+NO2-] concentrations during drifter survey 2.

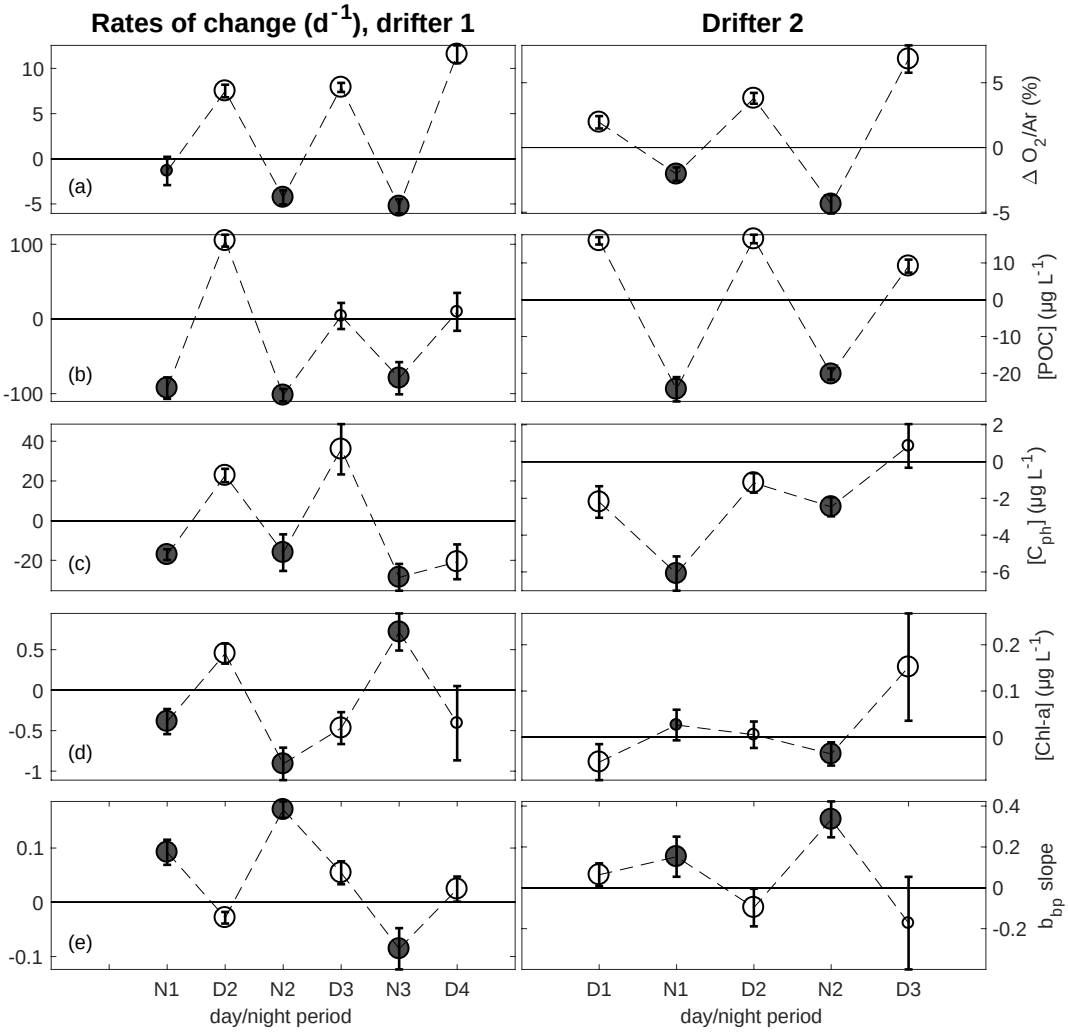

Figure S4: Rate of change of surface water properties derived from linear regressions over successive day (D open circle) and night (N shaded circle) intervals during the two drifter deployments. (a) Biological oxygen saturation ($\Delta O_2/Ar$), (b) particulate organic carbon (POC) concentration, (c) phytoplankton carbon (C_{ph}) concentration and (d) chlorophyll-a (Chl-a) concentration. Slopes of significant linear regressions ($p<0.05$) are plotted as larger circles, and slopes of non-significant linear regressions ($p\geq0.05$) are plotted as smaller circles. The vertical bars for each slope value span the lower and upper 95th confidence intervals of the regression slopes.