

Table S1. The Copernicus dataset statistical summary with respective symbols and their full forms

Item	Full-Form	Min	Max	Mean	Standard Deviation	Unit
spco2	Surface CO ₂	27.6343	47.6918	37.09361	3.492898	<i>Pa</i>
o2	Dissolved Oxygen	194.507	244.464	206.7071	8.010823	<i>mmolm⁻³</i>
no3	Nitrate	0.002294	16.1816	0.193351	0.678482	<i>mmolm⁻³</i>
po4	Phosphate	2.92E-05	0.109444	0.002674	0.005743	<i>mmolm⁻³</i>
phyc	Total Phytoplankton	0.799526	4.84236	1.328597	0.320024	<i>mmolm⁻³</i>
si	Dissolved Silicate	1.44312	15.2757	3.825409	0.951438	<i>mmolm⁻³</i>
ph	pH	7.96545	8.1759	8.065236	0.036145	-
fe	Dissolved Iron	0.000148	0.005593	0.001102	0.000499	<i>mmolm⁻³</i>
mlo2st	Density Ocean Mixed Layer Thickness	10.5289	129.093	27.94306	17.53611	<i>m</i>
thetao	Temperature	16.6903	31.0023	26.58887	2.554278	<i>°C</i>
bottomT	Sea Floor Potential Temperature	3.83077	29.2195	7.946663	7.265639	<i>°C</i>
vo	Northward Velocity	-1.24699	1.55522	0.052364	0.264279	<i>ms⁻¹</i>
uo	Eastward Velocity	-1.1298	1.27384	-0.00881	0.230234	<i>ms⁻¹</i>
so	Salinity	29.0002	36.9503	36.12722	0.506528	<i>1e⁻³</i>
zos	Sea Surface Height	-0.47762	0.786462	-0.03472	0.178039	<i>m</i>