

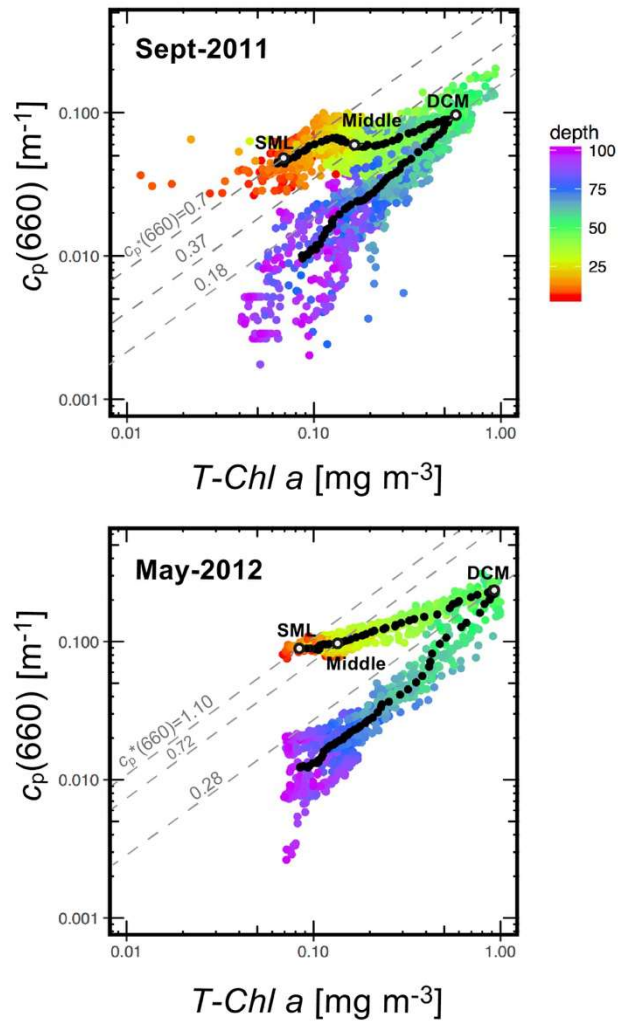
## SUPPLEMENTARY TABLES AND FIGURES

**Table S1.** General physical and bio-optical characteristics, and HPLC phytoplanktonic pigments of the three evaluated layers during the two SUMMER cruises

Cruise	(Sept-2011)			(May-2012)		
	Average ( $\pm$ SD)			Average ( $\pm$ SD)		
Layers	SML	Middle	DCM	SML	Middle	DCM
<i>Physical and Bio-optical characteristics</i>						
$\bar{E}_d$ (PAR) [mol quanta $m^{-2} d^{-1}$ ]	27.96 (6.160)	4.197 (1.024)	0.724 (0.284)	31.71 (9.440)	9.377 (2.820)	1.425 (0.312)
$c_p$ (660) [ $m^{-1}$ ]	0.046 (0.013)	0.062 (0.013)	0.105 (0.043)	0.088 (0.008)	0.096 (0.008)	0.248 (0.031)
$c_p^*$ (660) [ $m^2 mg^{-1}$ ]	0.654 (0.103)	0.372 (0.069)	0.178 (0.034)	1.102 (0.141)	0.723 (0.139)	0.277 (0.031)
$a_{ph}$ (440) [ $m^{-1}$ ]	0.008 (0.002)	0.016 (0.002)	0.038 (0.012)	0.009 (0.001)	0.013 (0.002)	0.077 (0.007)
$a_{ph}$ (675) [ $m^{-1}$ ]	0.002 (0.001)	0.005 (0.001)	0.013 (0.005)	0.002 ( $3 \cdot 10^{-4}$ )	0.004 ( $5 \cdot 10^{-4}$ )	0.031 (0.003)
$a_{ph}^*$ (440) [ $m^2 mg^{-1}$ ]	0.110 (0.026)	0.083 (0.009)	0.067 (0.009)	0.125 (0.013)	0.101 (0.014)	0.081 (0.008)
$a_{ph}^*$ (675) [ $m^2 mg^{-1}$ ]	0.028 (0.007)	0.024 (0.003)	0.023 (0.005)	0.034 (0.003)	0.032 (0.004)	0.032 (0.003)
$a_{ph-ppc}^*$ (440) [ $m^2 mg^{-1}$ ]	0.034 (0.010)	0.022 (0.004)	0.009 (0.002)	0.032 (0.018)	0.017 (0.002)	0.007 (0.001)
$a_{ph-ppsp}^*$ (440) [ $m^2 mg^{-1}$ ]	0.076 (0.019)	0.061 (0.006)	0.058 (0.009)	0.093 (0.007)	0.084 (0.016)	0.074 (0.007)
$a_{sol}^*$ (440) [ $m^2 mg^{-1}$ ]	0.156 (0.013)	0.139 (0.005)	0.123 (0.003)	0.149 (0.007)	0.144 (0.009)	0.121 (0.007)
$Q_a^*$ (440) [d.l.]	0.695 (0.089)	0.608 (0.067)	0.531 (0.071)	0.838 (0.062)	0.685 (0.057)	0.667 (0.057)
<i>HPLC pigments<sup>#</sup> and DPA</i>						
<i>T-Chl a</i> [ $mg m^{-3}$ ]	0.066 (0.011)	0.166 (0.055)	0.611 (0.052)	0.078 (0.011)	0.133 (0.007)	0.955 (0.031)
<i>PSC:T-Chl a</i>	0.613 (0.093)	0.637 (0.109)	0.658 (0.071)	0.685 (0.065)	0.726 (0.081)	0.825 (0.031)
<i>PPC:T-Chl a</i>	0.538 (0.078)	0.436 (0.056)	0.163 (0.024)	0.417 (0.110)	0.281 (0.064)	0.125 (0.007)
<i>NPP index</i>	0.220 (0.025)	0.172 (0.019)	0.064 (0.010)	0.172 (0.036)	0.115 (0.021)	0.050 (0.007)
<i>T-APSP:T-Chl a</i>	0.912 (0.110)	1.099 (0.151)	1.393 (0.084)	0.977 (0.059)	1.115 (0.096)	1.354 (0.031)
<i>T-Chl b:T-Chl a</i>	0.126 (0.011)	0.235 (0.017)	0.462 (0.059)	0.083 (0.006)	0.151 (0.009)	0.216 (0.007)
<i>T-Chl c:T-Chl a</i>	0.185 (0.041)	0.227 (0.040)	0.274 (0.027)	0.208 (0.017)	0.240 (0.028)	0.312 (0.007)
<i>19'-HF:T-Ch a</i>	0.296 (0.056)	0.347 (0.059)	0.271 (0.004)	0.381 (0.004)	0.378 (0.005)	0.423 (0.007)
<i>19'-BF:T-Ch a</i>	0.111 (0.015)	0.151 (0.027)	0.208 (0.041)	0.165 (0.013)	0.174 (0.023)	0.228 (0.007)
<i>Zeax:T-Chl a</i>	0.332 (0.048)	0.323 (0.044)	0.102 (0.215)	0.099 (0.024)	0.095 (0.020)	0.037 (0.007)
<i>Dd:T-Chl a</i>	0.131 (0.031)	0.064 (0.010)	0.031 (0.004)	0.217 (0.067)	0.115 (0.018)	0.050 (0.007)
<i>DV-Chl a:T-Chl a</i>	0.075 (0.029)	0.246 (0.027)	0.237 (0.030)	ND	0.020 (0.011)	0.028 (0.007)
$F_{micro}$ [%]	25.10 (4.226)	15.79 (1.662)	18.97 (3.834)	21.11 (1.674)	23.55 (1.913)	20.87 (2.312)
$F_{nano}$ [%]	37.59 (3.372)	41.26 (3.439)	35.36 (3.949)	60.64 (2.929)	53.56 (2.373)	56.44 (1.425)
$F_{pico}$ [%]	37.31 (3.967)	42.94 (4.679)	45.66 (4.854)	18.24 (1.874)	22.88 (3.053)	22.69 (1.425)
SI [ $\mu m$ ]	14.45 (1.425)	10.39 (0.937)	11.75 (1.894)	13.77 (0.729)	14.68 (0.943)	13.49 (1.425)

<sup>#</sup> Only main diagnostic pigments are presented

**Fig. S1.** Beam attenuation for particles [ $c_p(660)$ ] as a function of  $T\text{-}Chl\ a$  through the illuminated water column of Sept-2011 and May-2012 as indicated. The lines drawn with a 1:1 slope correspond to values of the  $Chl\ a$ -specific particulate attenuation [ $c_p^*(660)$ , in  $m^2\ mg^{-1}$ ]. The depths of the three evaluated layers: Surface mixed layer (SML), Middle layer (Middle) and Deep Chlorophyll Maxima (DCM) are indicated.



**Fig. S2.** Vertical variability of the phytoplankton specific absorption coefficient at 440 nm [ $a^*_{\text{ph}}$  (440)] (a), and the absorption contribution by the photoprotective [ $a^*_{\text{ph-ppc}}$  (440)] (b) and the photosynthetic [ $a^*_{\text{ph-psp}}$  (440)] pigment fractions (c) partitioned following Babin et al. (1996).

