



# Biogeochemistry of Coccolithophore Blooms along the Continental Margin of the Northern Bay of Biscay

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**ULB**

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# The PEACE Project

## Objectives:

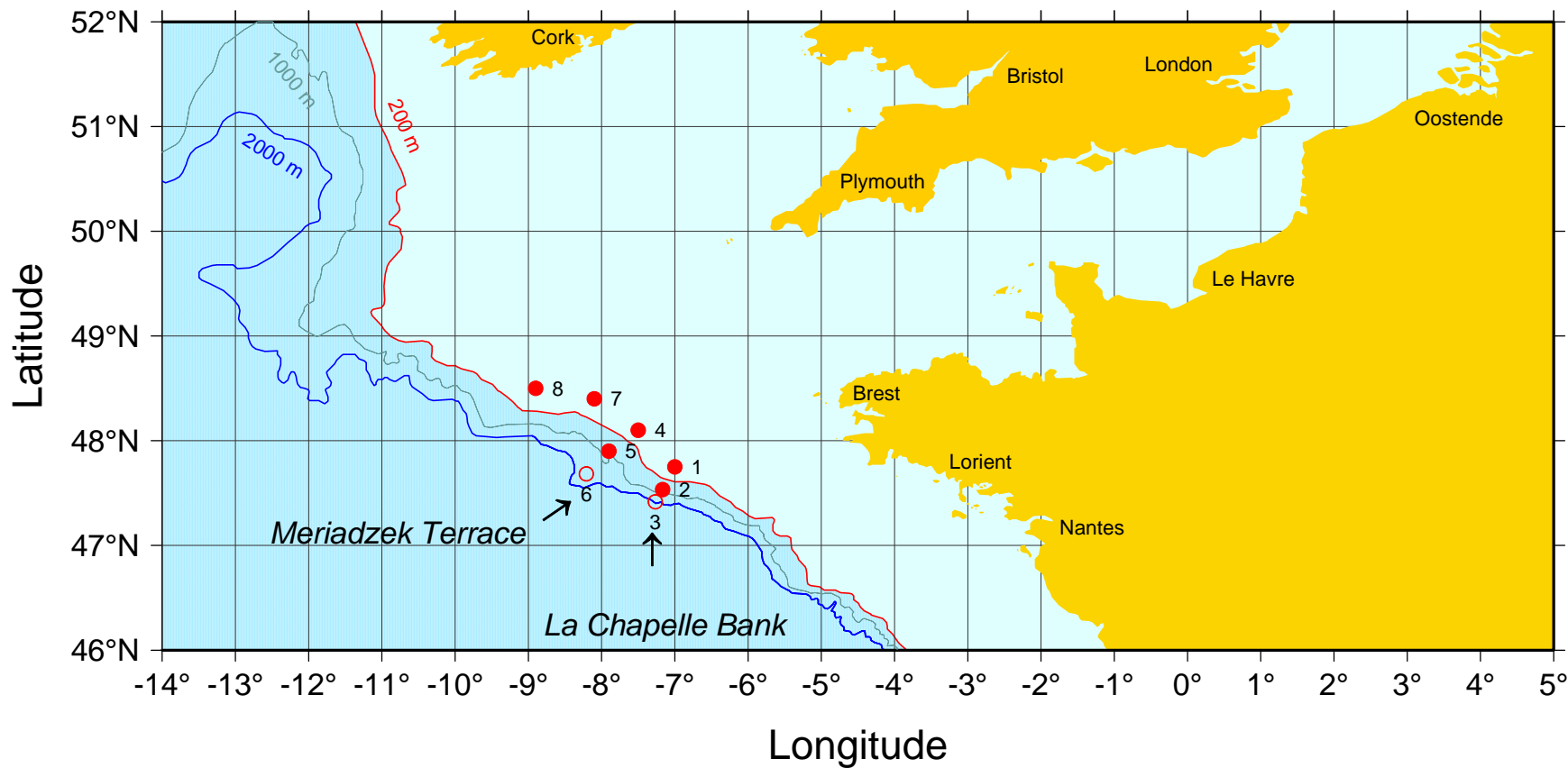
To evaluate the role in climate regulation of calcification, primary production and export processes during blooms of coccolithophores, an important group of calcifying phytoplankton.

## Methodology:

To apply a transdisciplinary approach that combines process-oriented field investigations with laboratory experiments and modelling tools.

### BELGICA BG2006/11 CRUISE

29 May – 10 June 2006

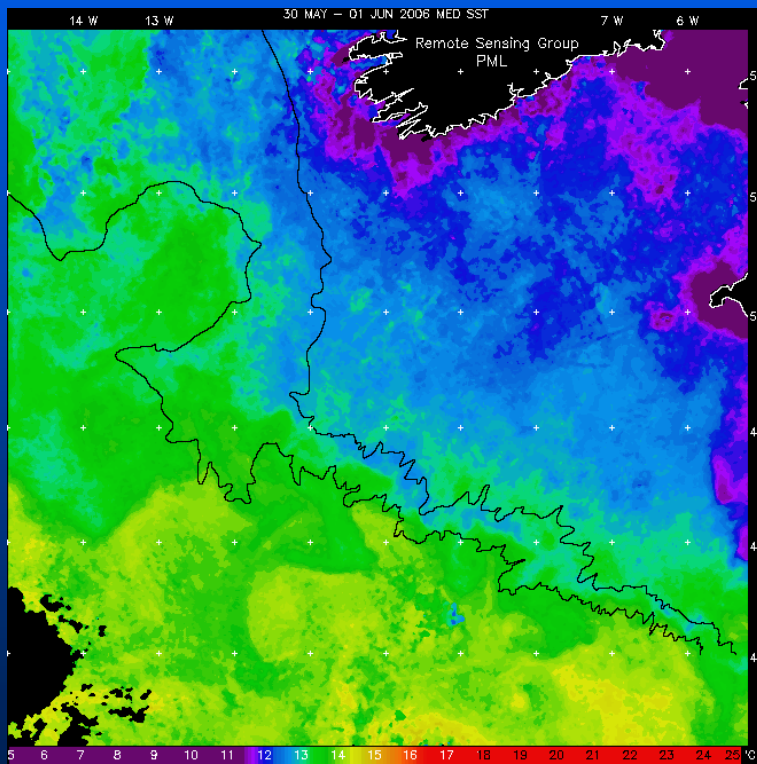


● Process-studies stations including CTD & water samples

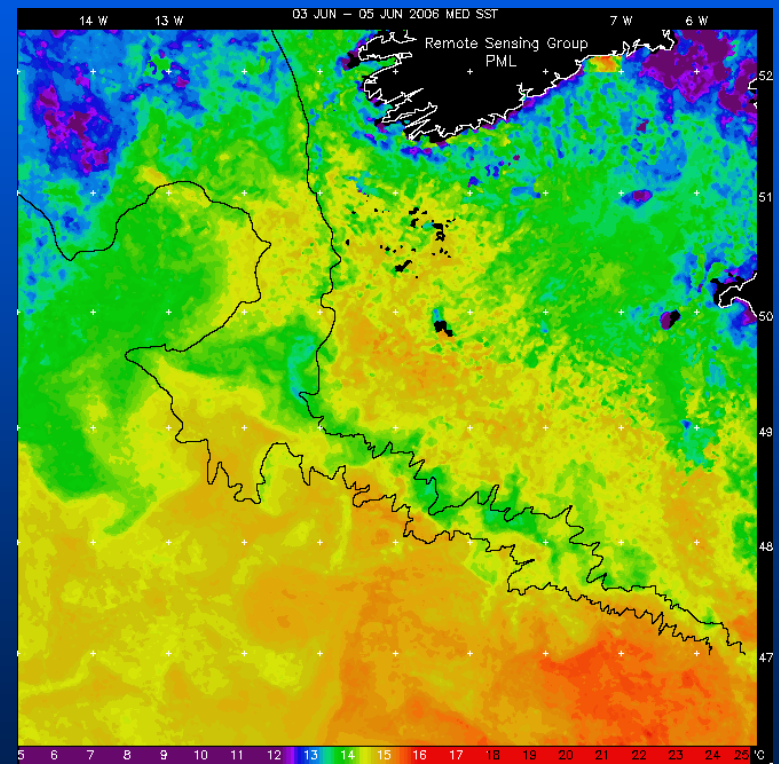
○ CTD + Water Samples

## Sea Surface Temperature

### 30 May – 01 June 06



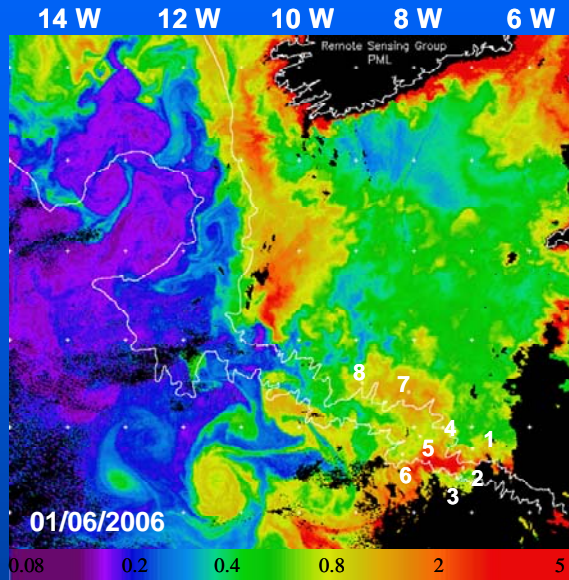
### 03 -05 June 06





## Chlorophyll

## Reflectance



52 N

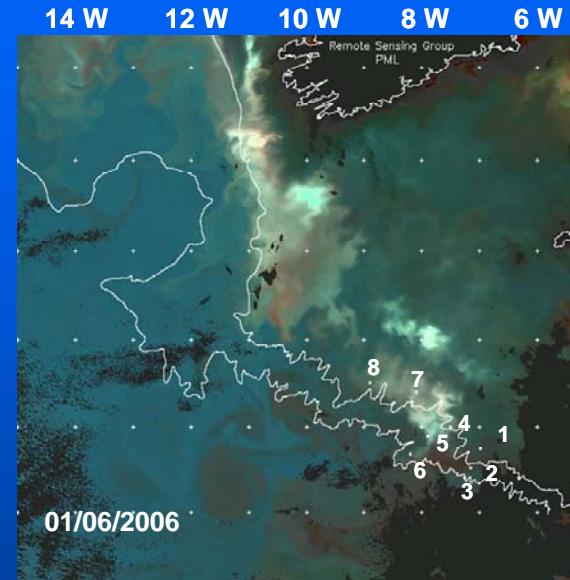
51 N

50 N

49 N

48 N

47 N



52 N

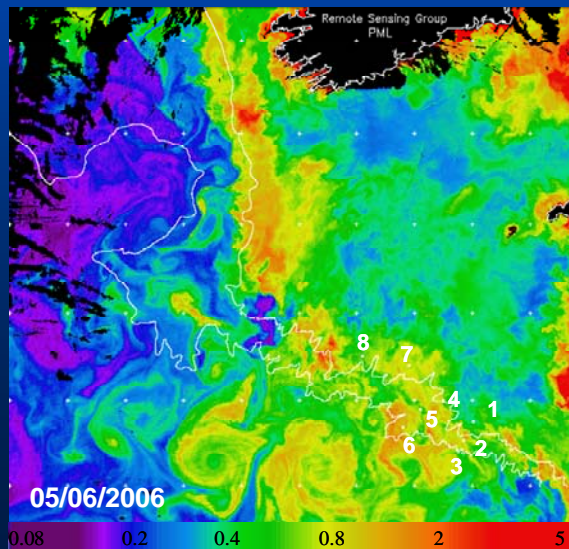
51 N

50 N

49 N

48 N

47 N



52 N

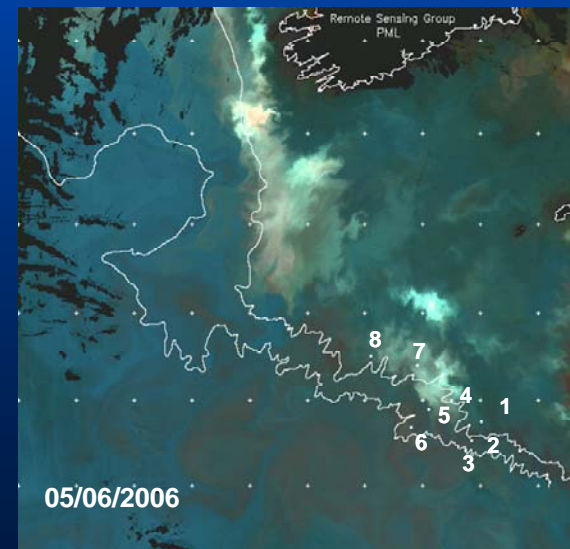
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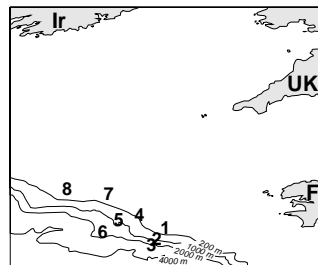
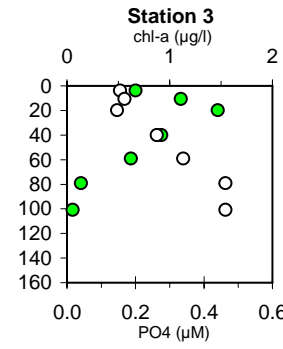
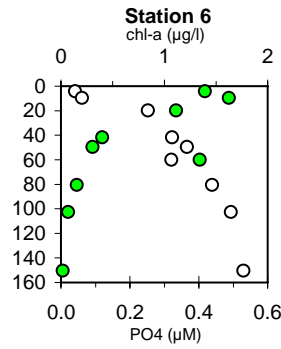
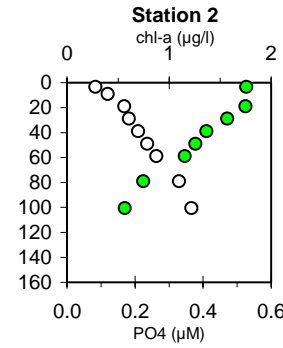
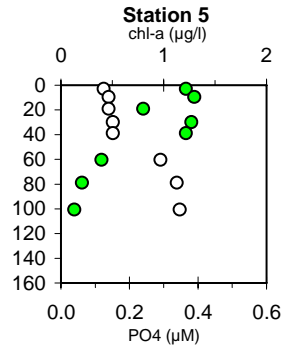
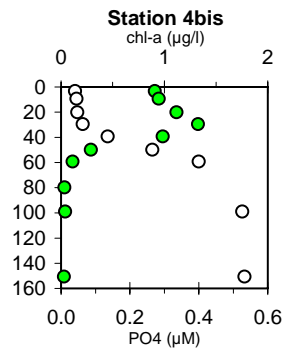
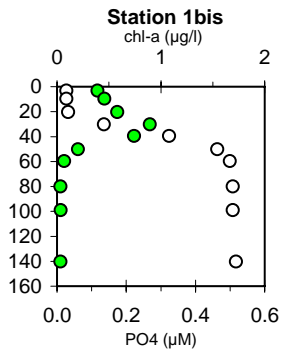
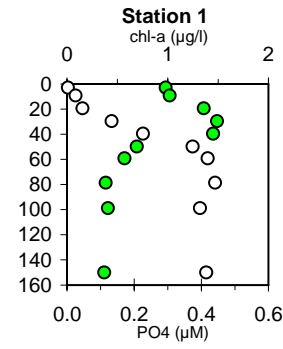
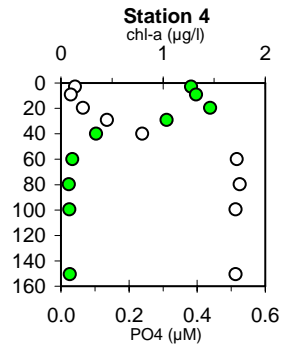
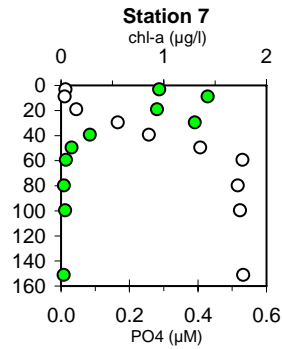
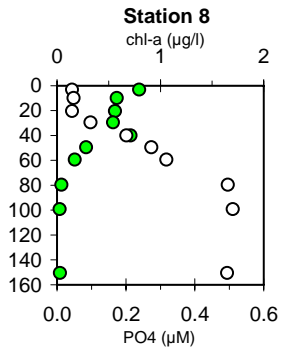
50 N

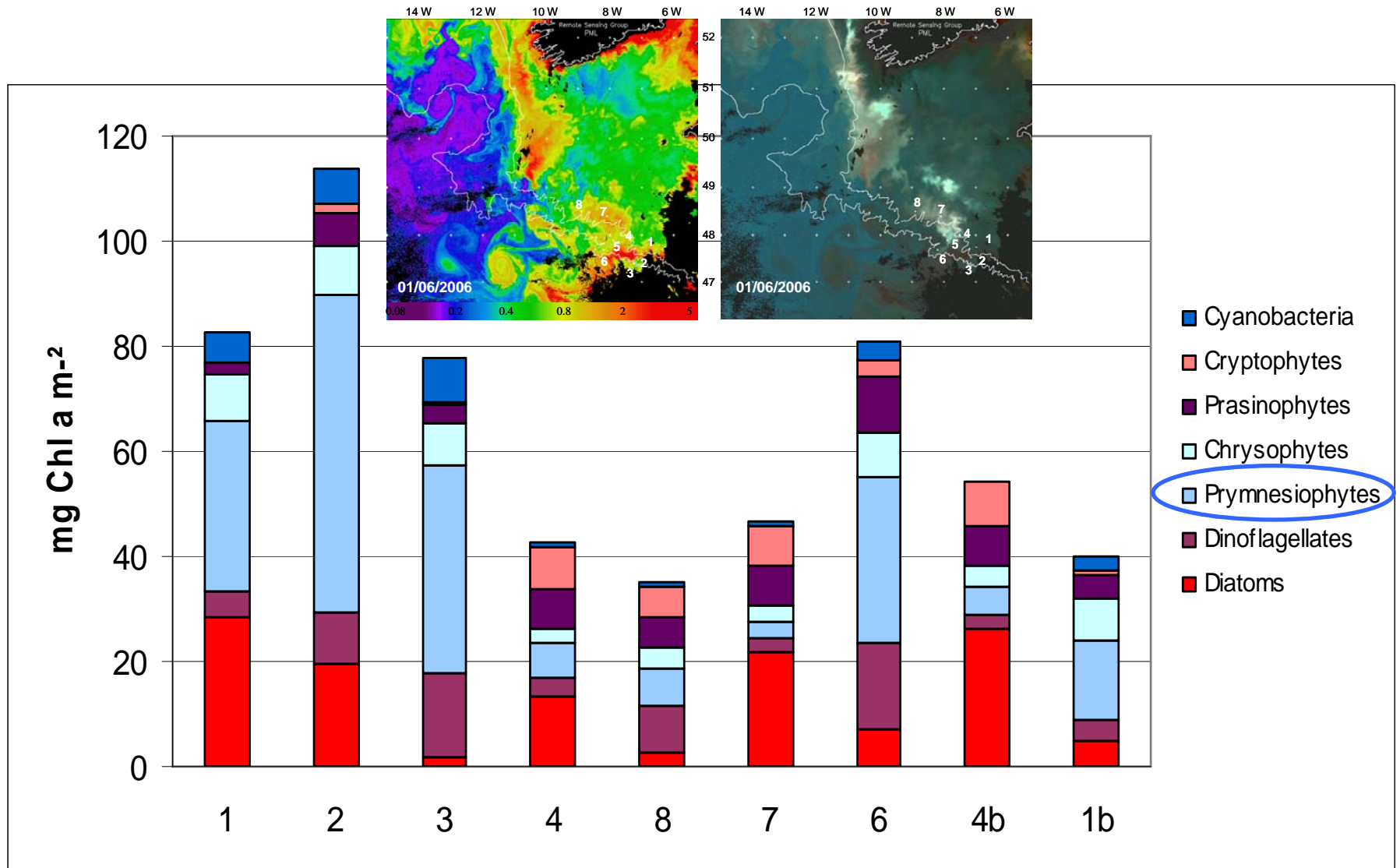
49 N

48 N

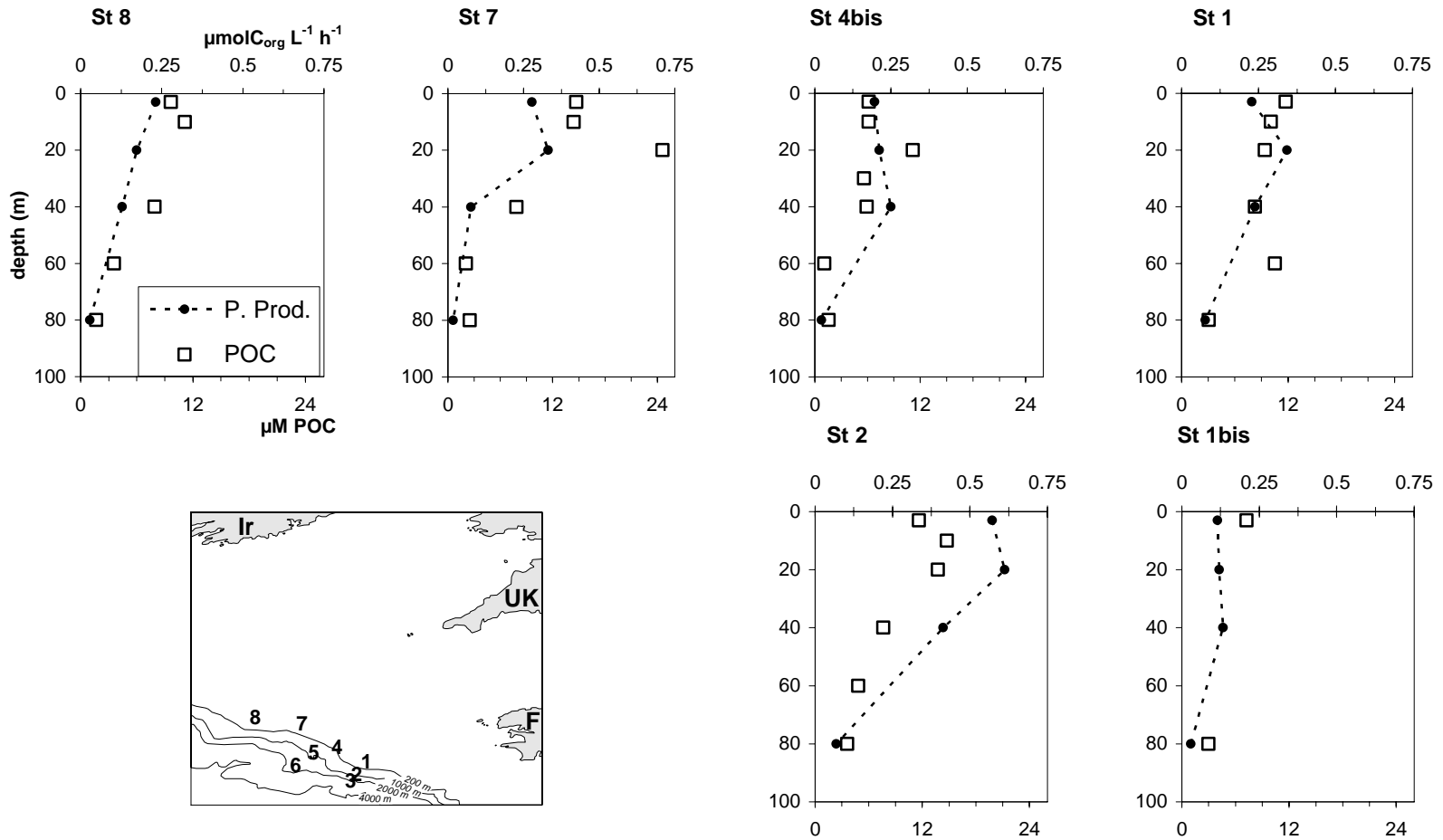
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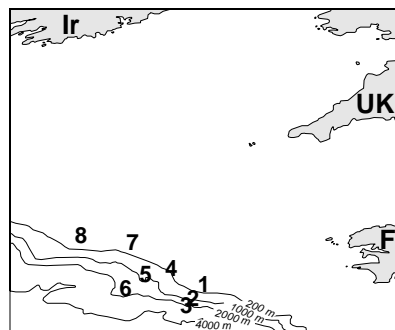
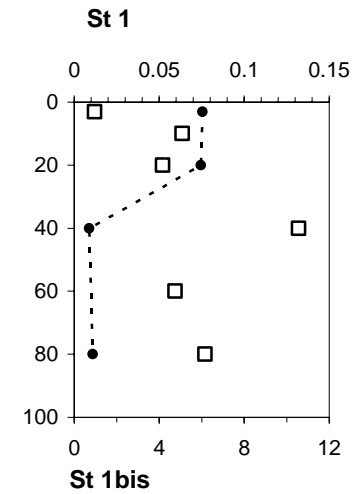
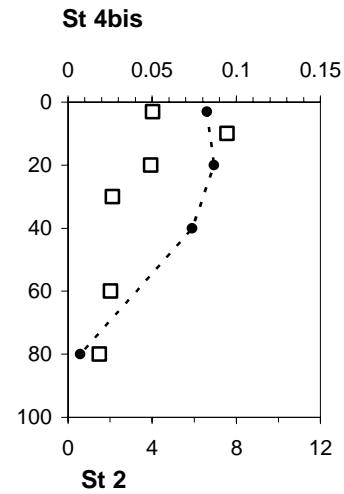
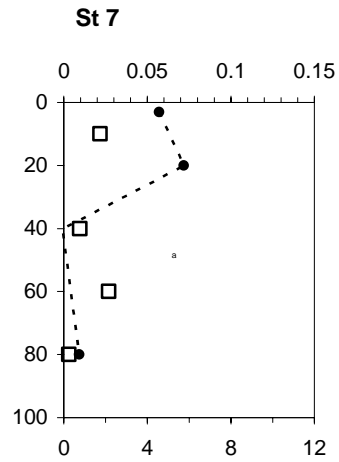
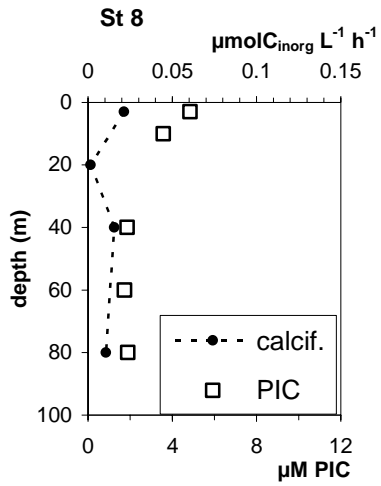


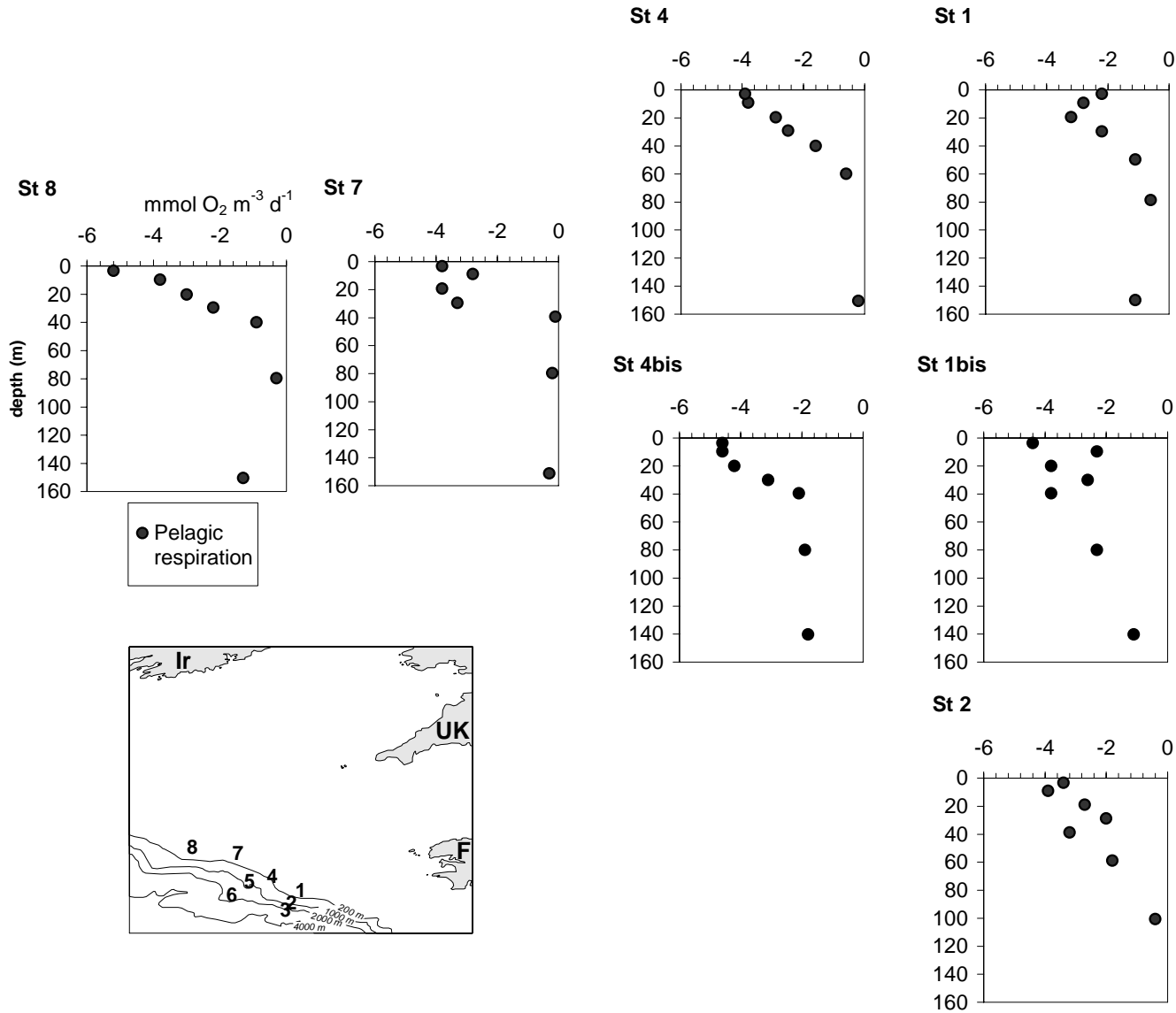






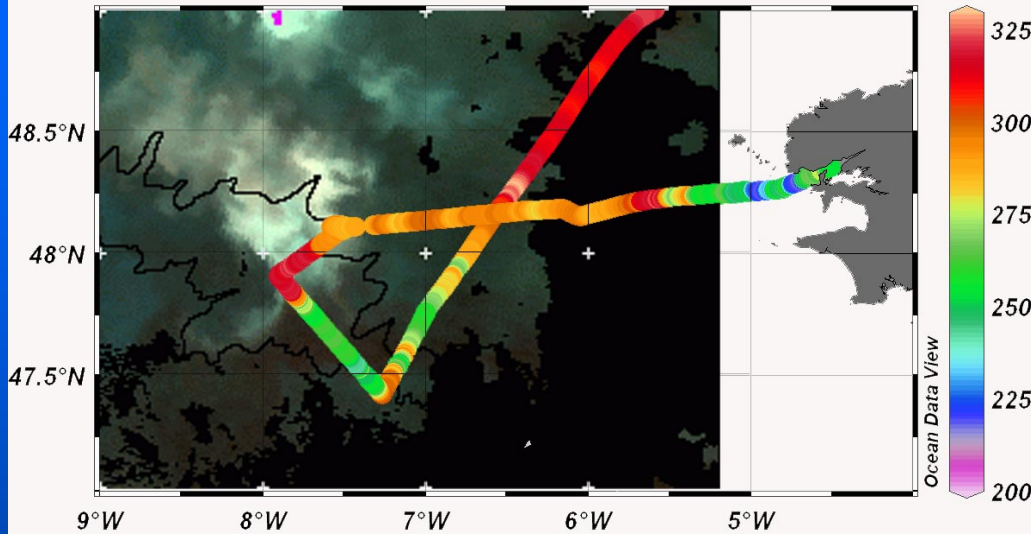






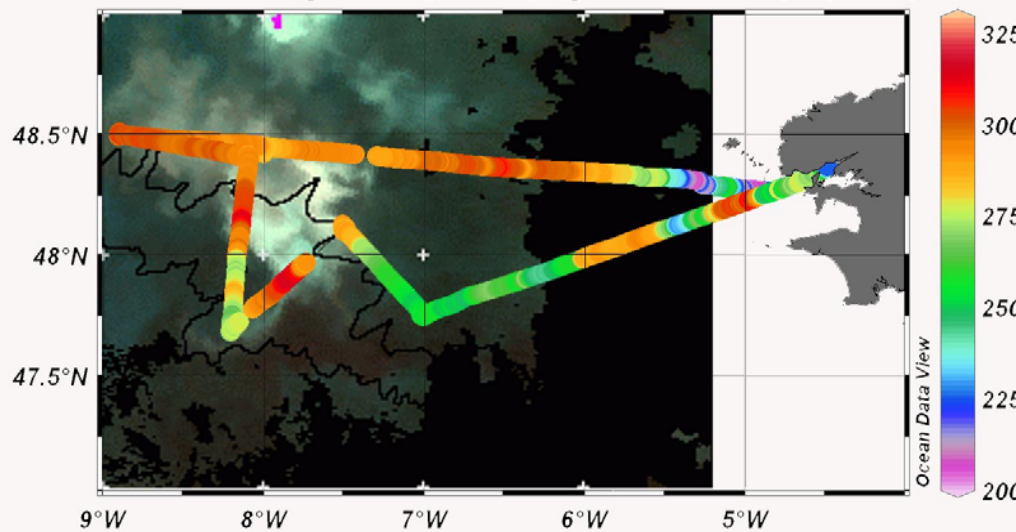


*pCO<sub>2</sub> moist@13°C [μatm] @ Pressure [m]=Top*

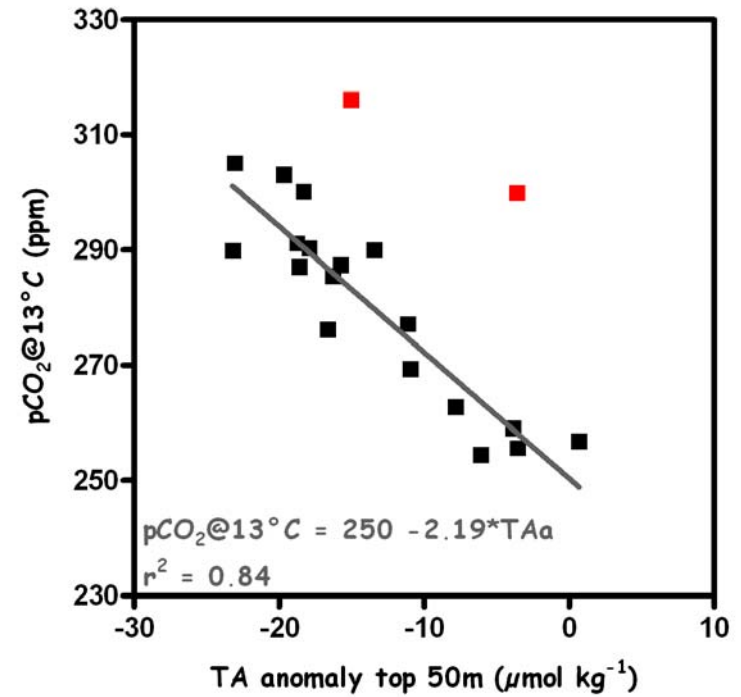
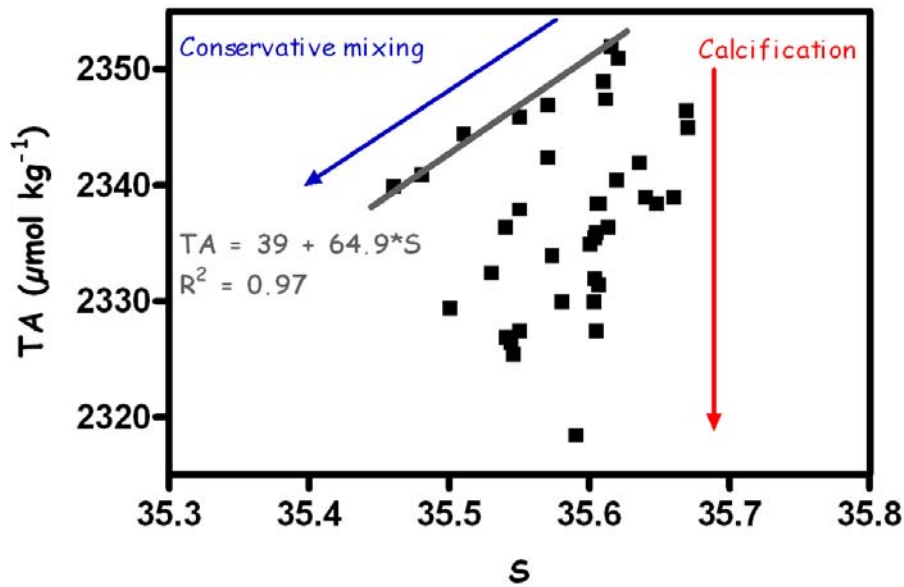


1st Leg  
29 May – 3 June

*pCO<sub>2</sub> moist@13°C [μatm] @ Pressure [m]=Top*



2nd Leg  
5 – 10 June





### C fluxes in mmol C m<sup>-2</sup> d<sup>-1</sup>

					Rate measurements			CO <sub>2</sub> Fluxes					C fluxes	
Station	Date	Total depth (m)	Photic depth (m)	pCO <sub>2</sub>	GPP <sub>p</sub>	CAL	PCR	GPP <sub>p</sub>	CAL	PCR	Net CO <sub>2</sub> flux based on metabolic rates	Net CO <sub>2</sub> flux based on measured pCO <sub>2</sub>	Export	Aphotic C demand
5	02-juin	500	26	320	74.2	24.2	-	-74.2	14.5	-	-	-9.1	-	-
2	01-juin	558	31	306	130.8	51.7	81.3	-130.8	31.0	81.3	-18.5	-11.4	49.5	89.0
1	31-mai	157	30	265	74.2	7.5	73.7	-74.2	4.5	73.7	4.0	-17.8	0.5	98.2
4 (HR)	02-juin	163	26	293	43.3	13.3	78.9	-43.3	8.0	78.9	43.6	-13.4	-35.6	66.9
1bis	09-juin	158	37	273	43.3	15.8	103.5	-43.3	9.5	103.5	69.7	-16.1	-60.2	159.0
4bis (HR)	08-juin	159	27	307	41.7	12.5	101.2	-41.7	7.5	101.2	67.0	-10.7	-59.5	168.5
7 (HR)	07-juin	164	26	309	71.7	28.3	81.4	-71.7	17.0	81.4	26.7	-10.2	-9.7	35.1
8 (HR)	06-juin	178	34	325	25.0	13.3	104.3	-25.0	8.0	104.3	87.3	-8.5	-79.3	72.3

Harley et al.  
(in preparation)

Positive CO<sub>2</sub> flux : ↑

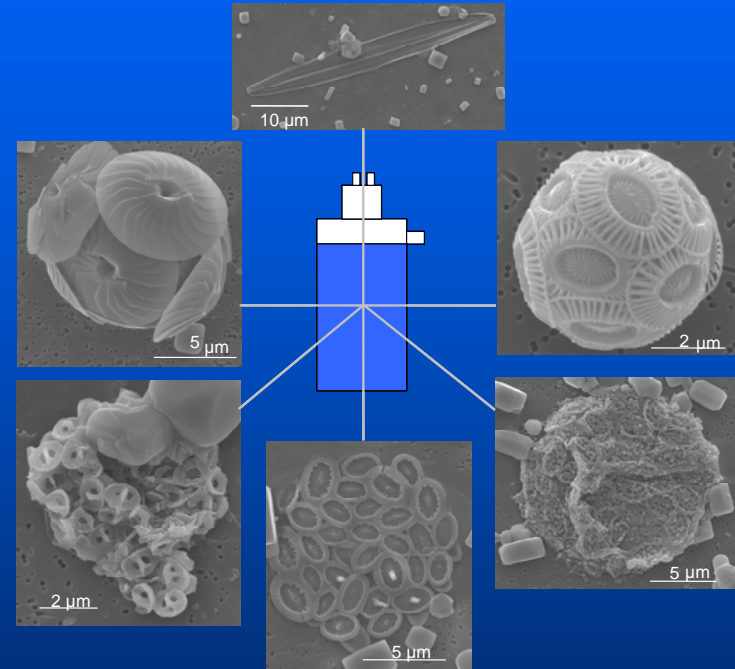
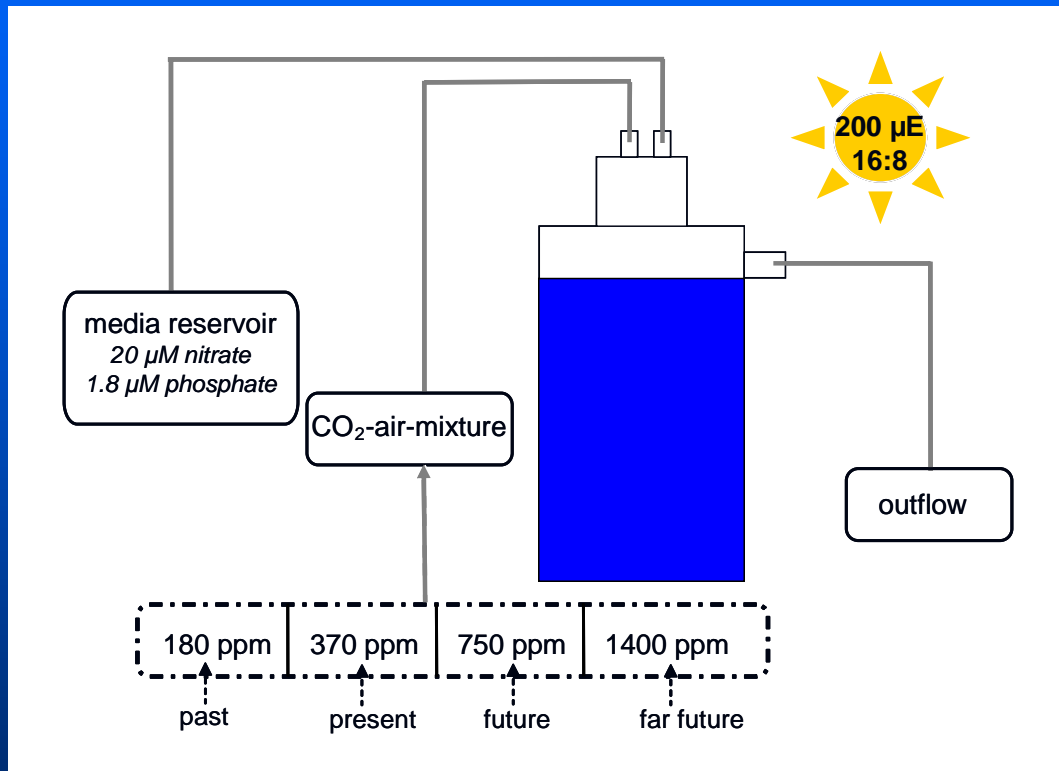
Negative CO<sub>2</sub> flux : ↓

Export = GPP<sub>p</sub> - PCR





# Effect of CO<sub>2</sub> on Natural Plankton Community

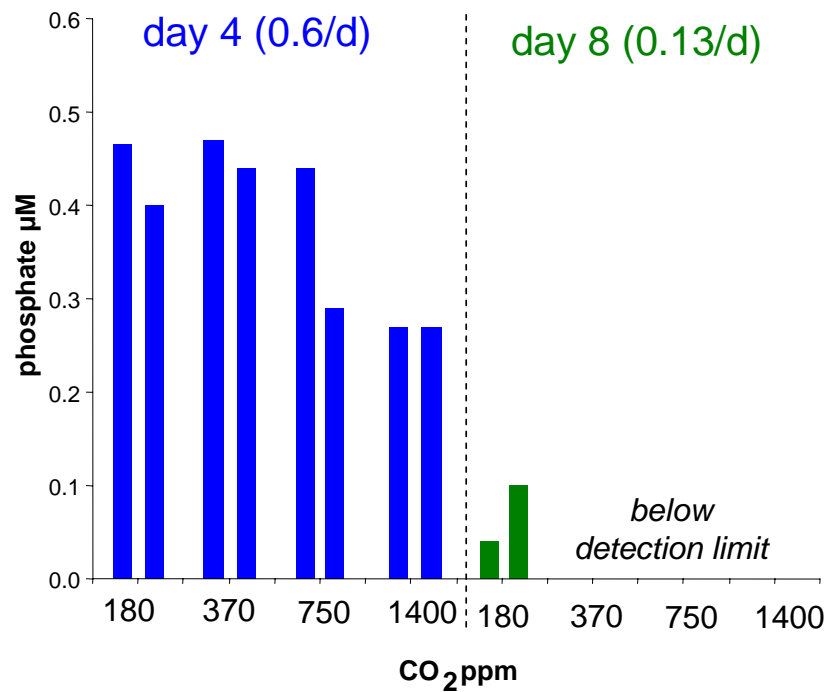
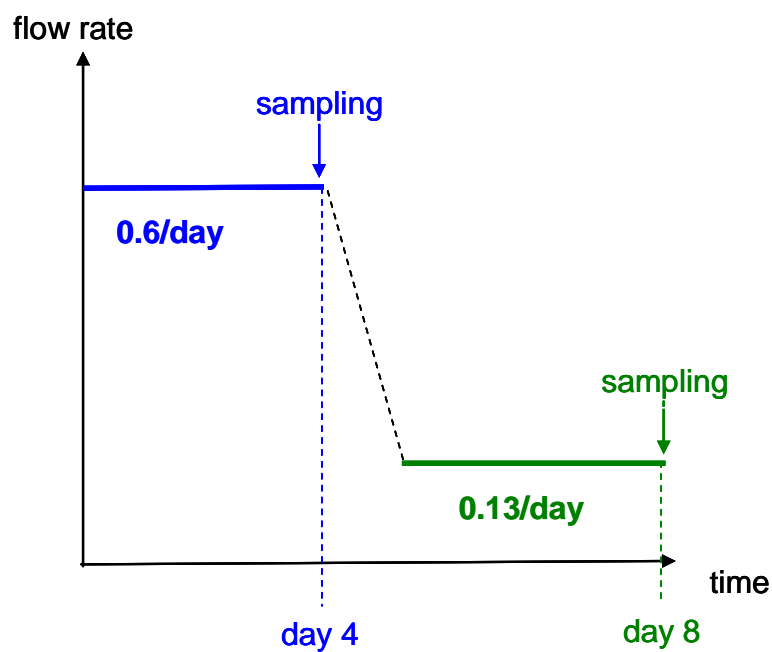


Station 2



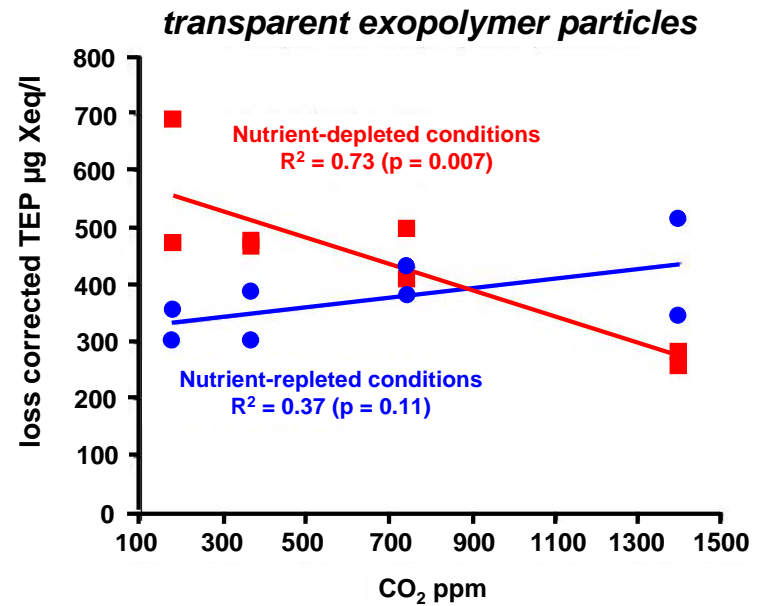
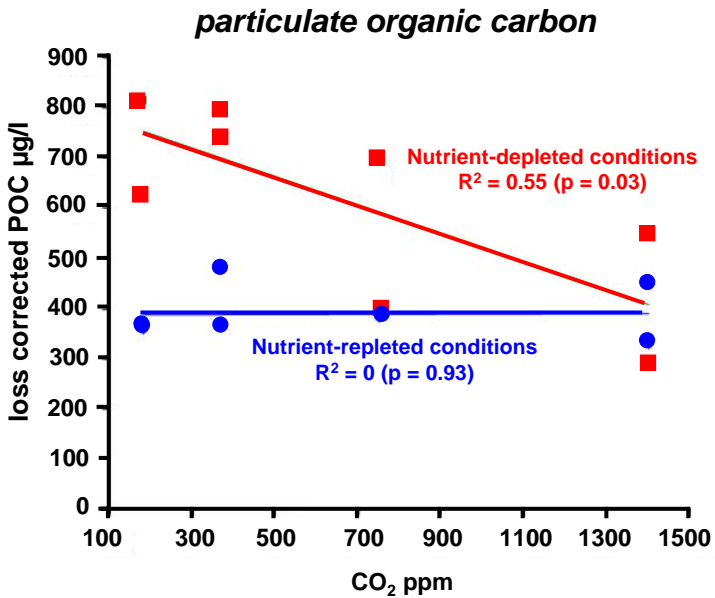
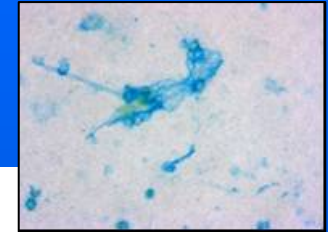
# Effect of CO<sub>2</sub> on Natural Plankton Community

flow rates and nutrients





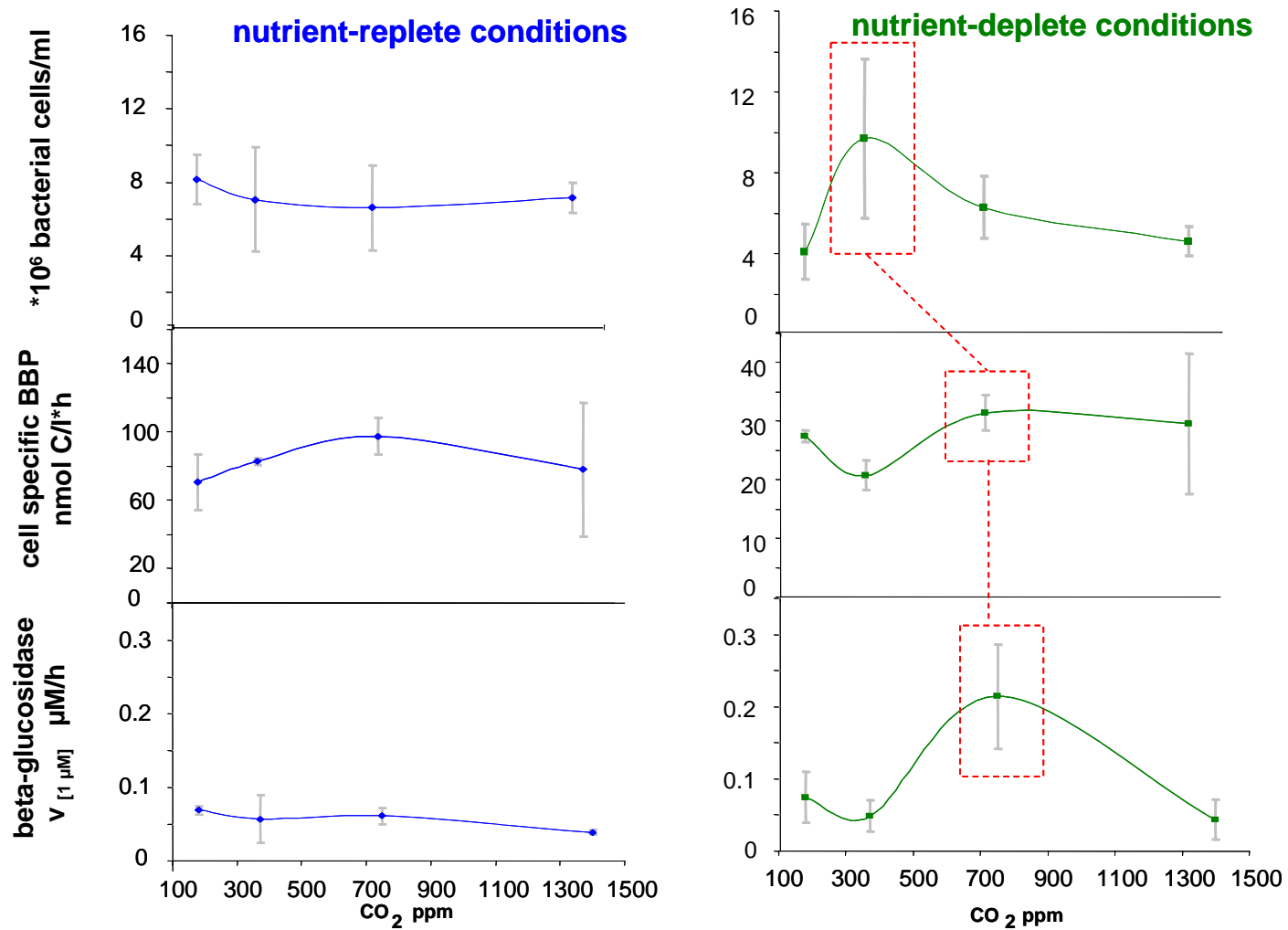
# Effect of CO<sub>2</sub> on Natural Plankton Community



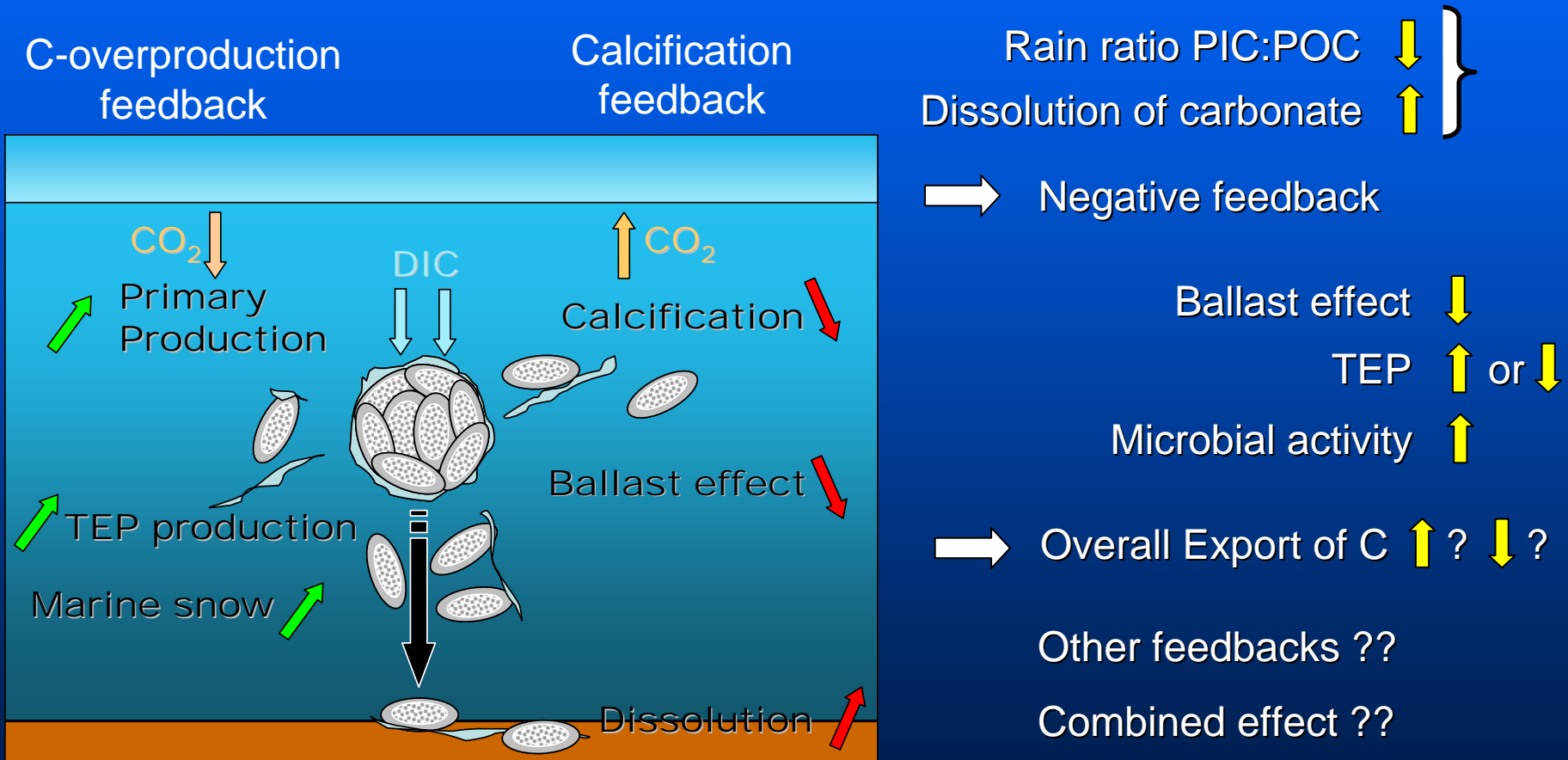


# Effect of CO<sub>2</sub> on Natural Plankton Community

## HETEROTROPHIC BIOLOGY

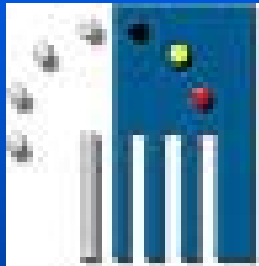


## Possible feedback mechanisms in response to increasing ocean acidification



Thank you for your attention.

## ACKNOWLEDGEMENTS



Belgian Federal Science Policy Office

