Microbial abundance and activity

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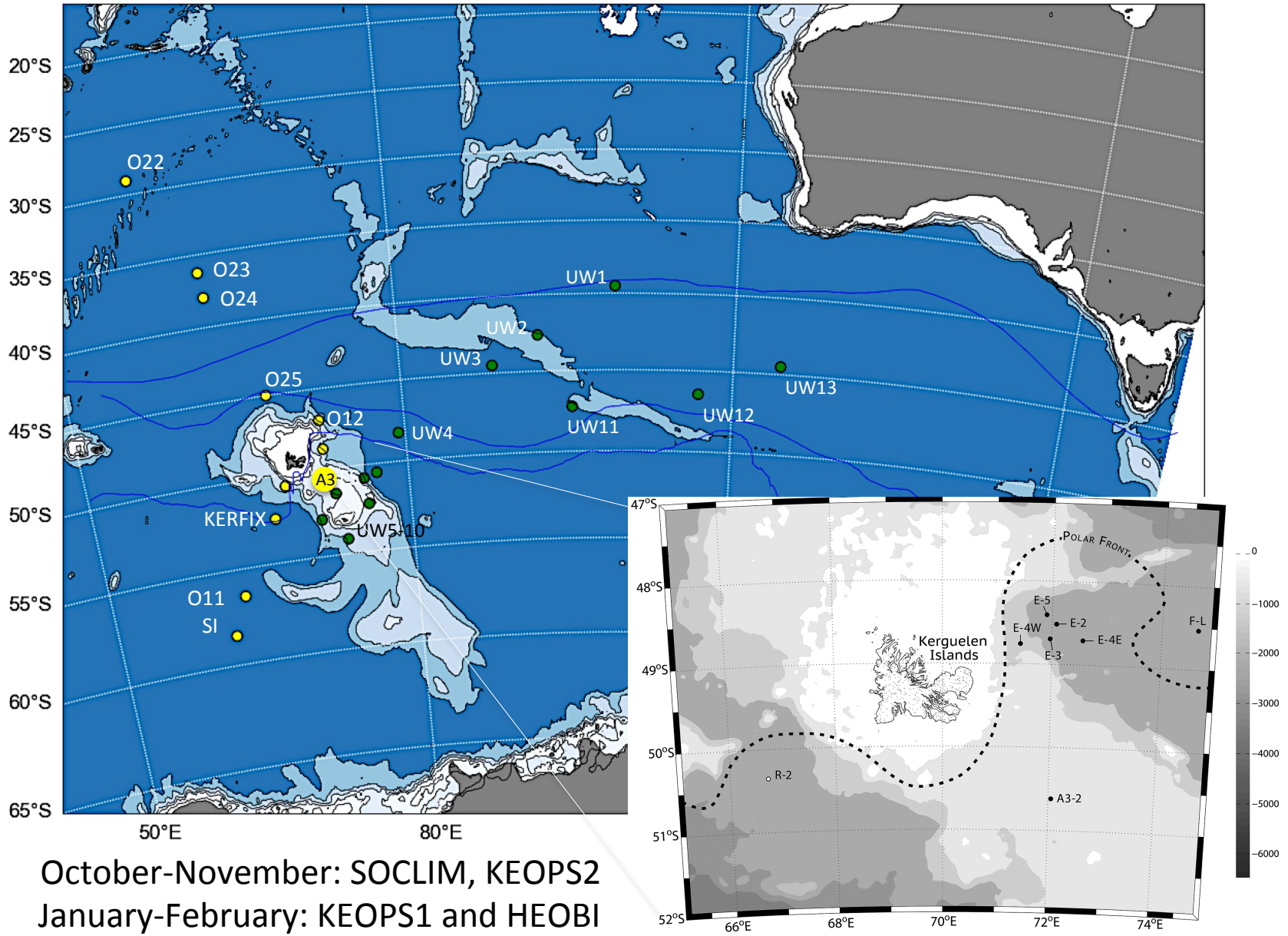
Overview of data on

- Microbial abundance and biomass
- Microbial respiration
- Net and gross community production

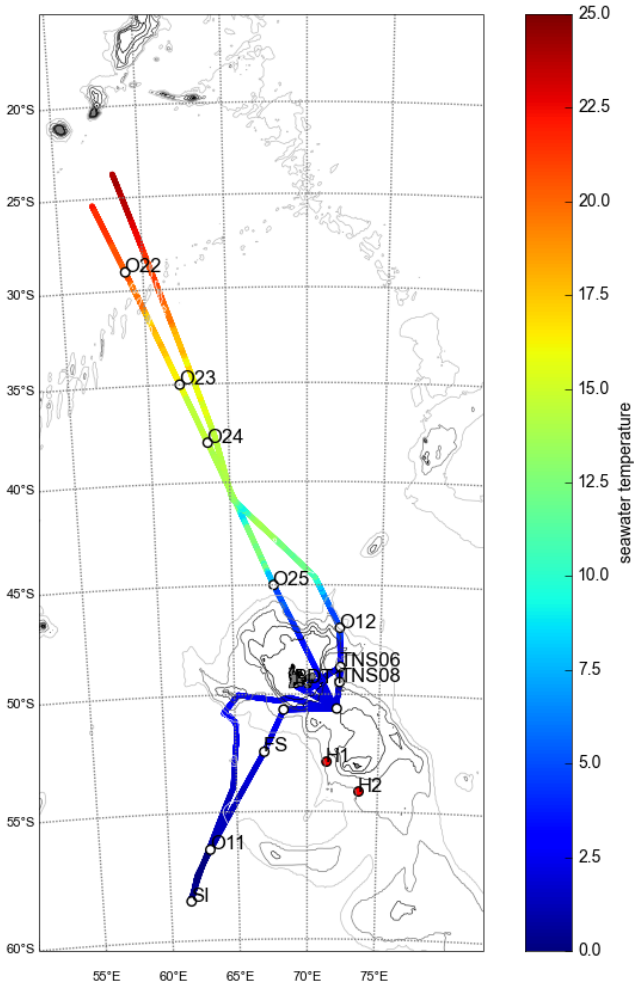
Study sites

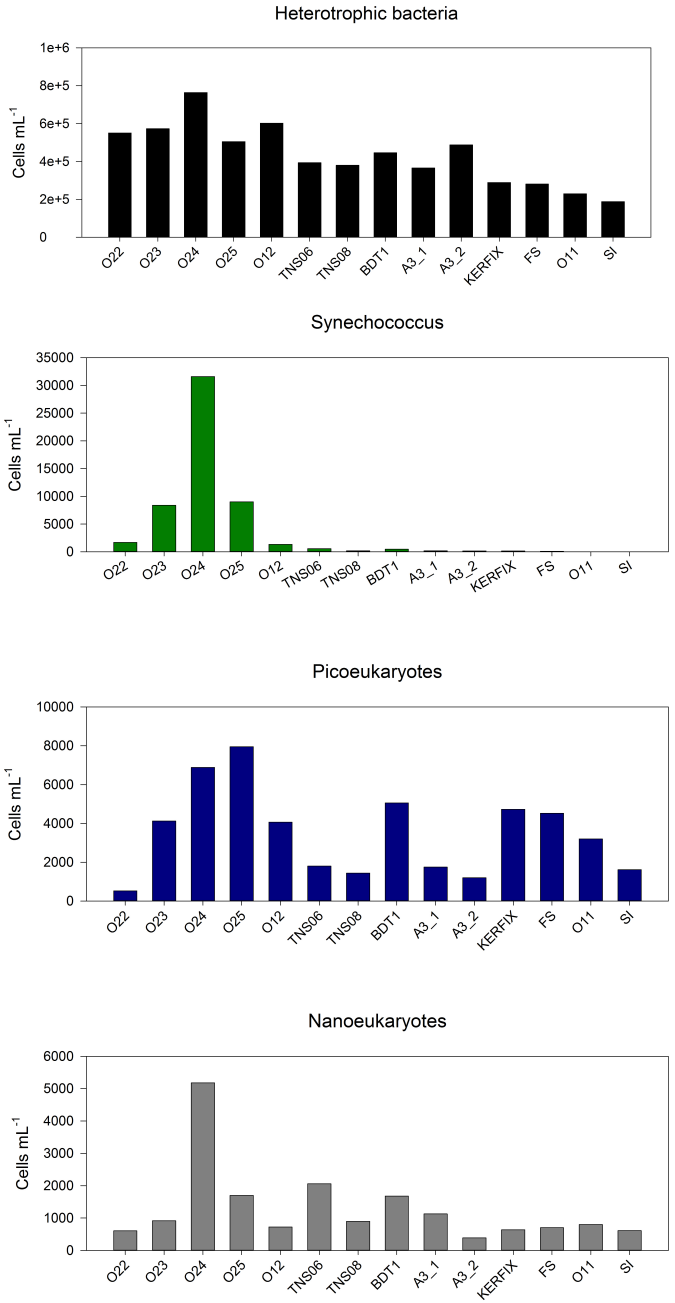


October-November: SOCLIM, KEOPS2

January-February: KEOPS1 and HEOBI

Microbial abundances in surface waters

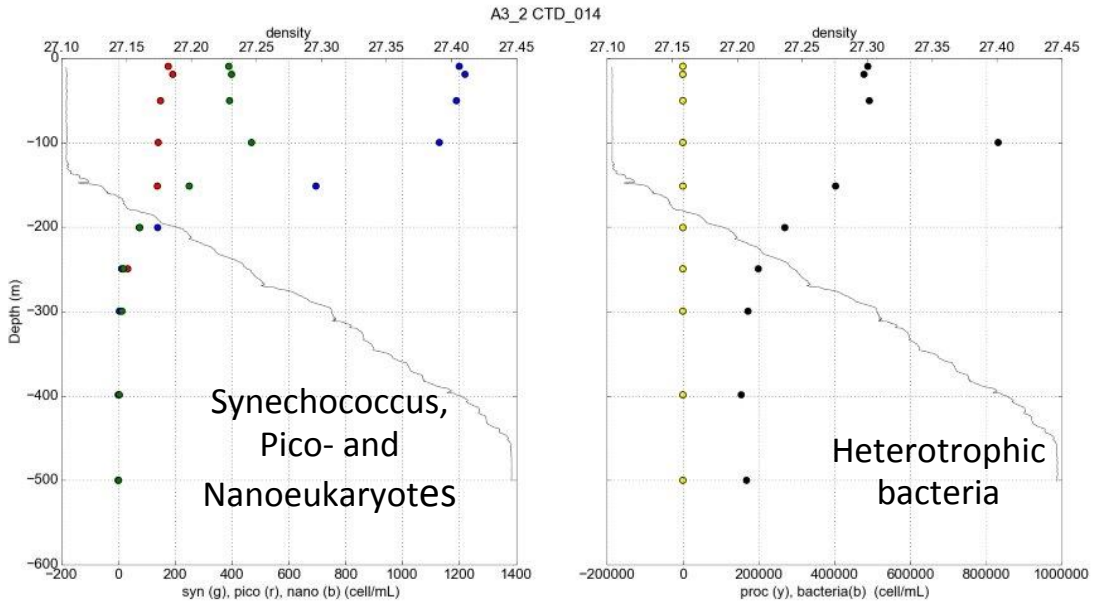




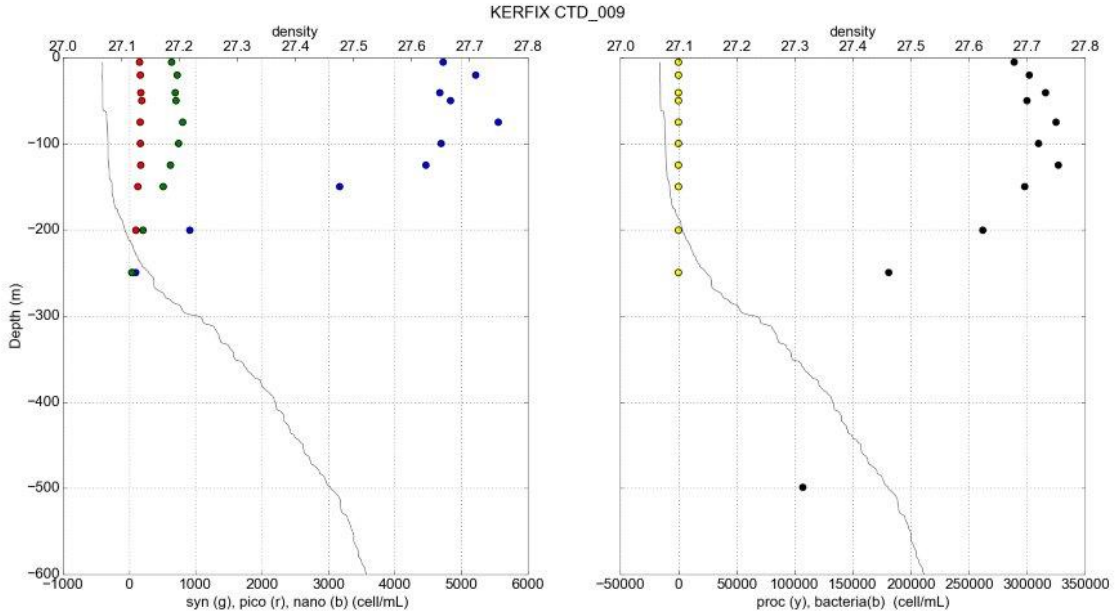
Pico: 0.2-2 µm
Nano: 2-20 µm

Microbial abundance: vertical distribution

Station A3-2



Station KERFIX



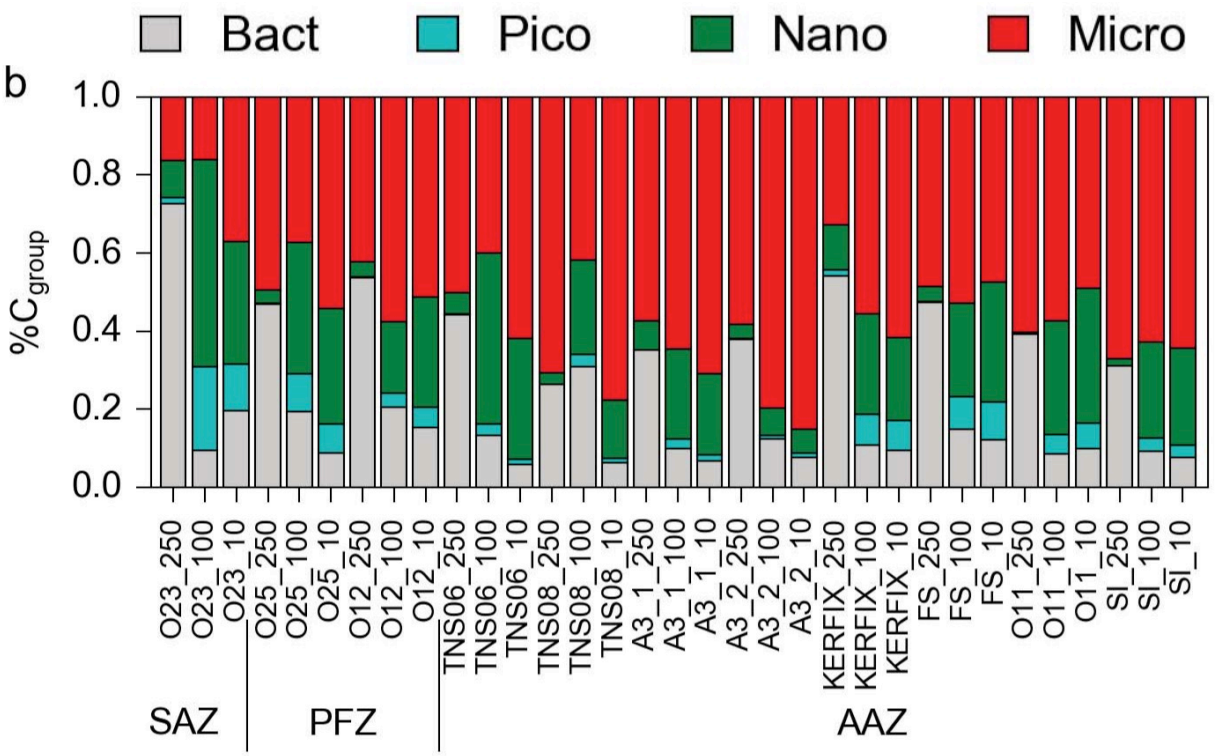
Composition of plankton carbon biomass

Table 1: Plankton groups considered in this study and their associated characteristics.

Plankton group	Contains	Method	Volume (μm^3)	Carbon content (pgC)
Bact	Heterotrophic bacteria	Cytometry	0.25[a]	0.015[a]
Pico	Prochlorococcus		0.68[b]	0.029[b]
	Synechococcus		0.86[b]	0.080[b]
	Picoeukaryotes		2.76[b]	0.73[b]
Nano	Nanoplankton		284[c]	15[c]
Micro	Diatom (55 groups)	Optical microscopy	Shape-specific	$C = 0.117V^{0.881}$[d]
	Dinoflagellate (14 groups)		Shape-specific	$C = 0.760V^{0.819}$[d]
	Ciliate (4 groups)		Shape-specific	$C = 0.216V^{0.939}$[d]
	Silicoflagellate (1 group)		3288	$C = 0.261V^{0.860}$[d]

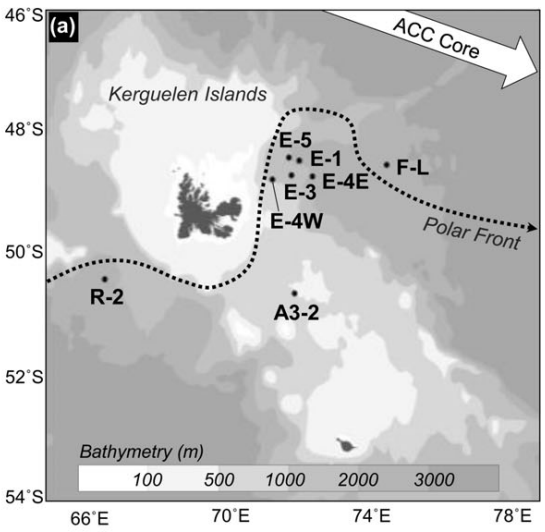
[a] *Bratbak* [1985]
[b] *Grob et al.* [2007]
[c] *Verity et al.* [1992]
[d] *Menden-Deuer and Lessard* [2000]

Pico: 0.2-2 µm
Nano: 2-20 µm
Micro: 20-200 µm



Rembauville et al. (in revision)

Composition of plankton carbon biomass



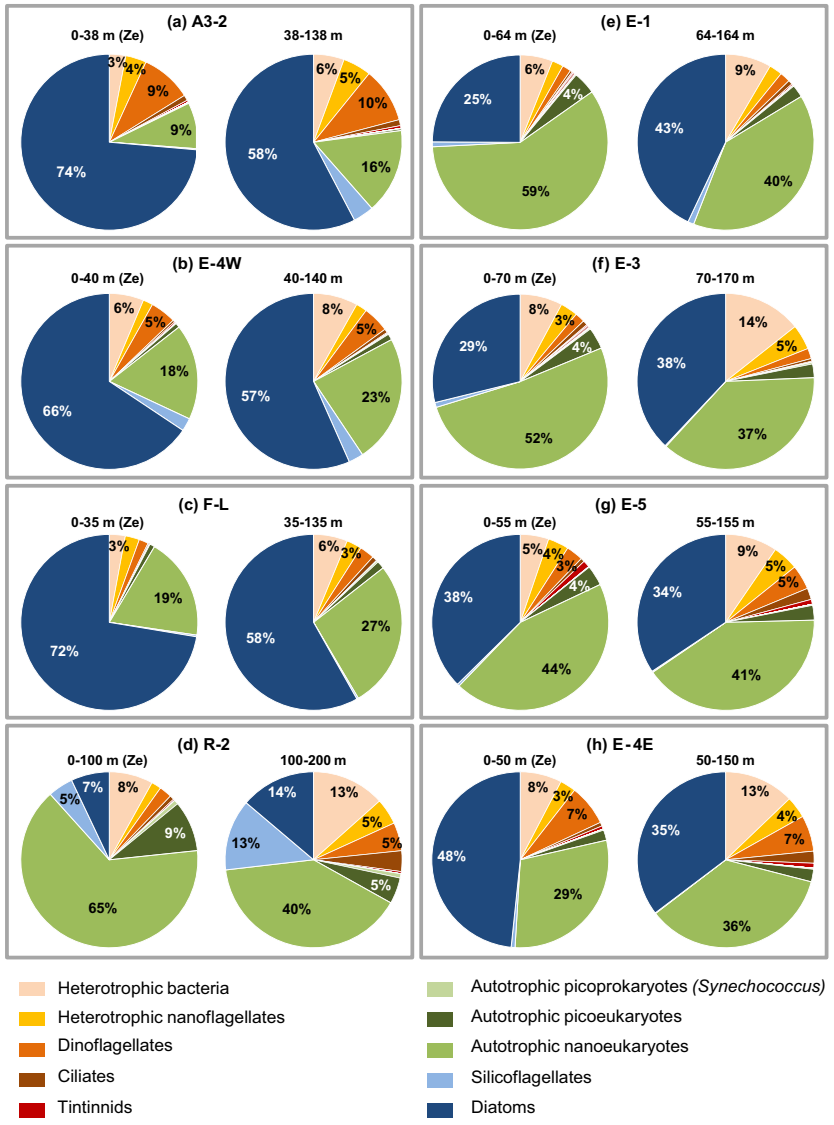


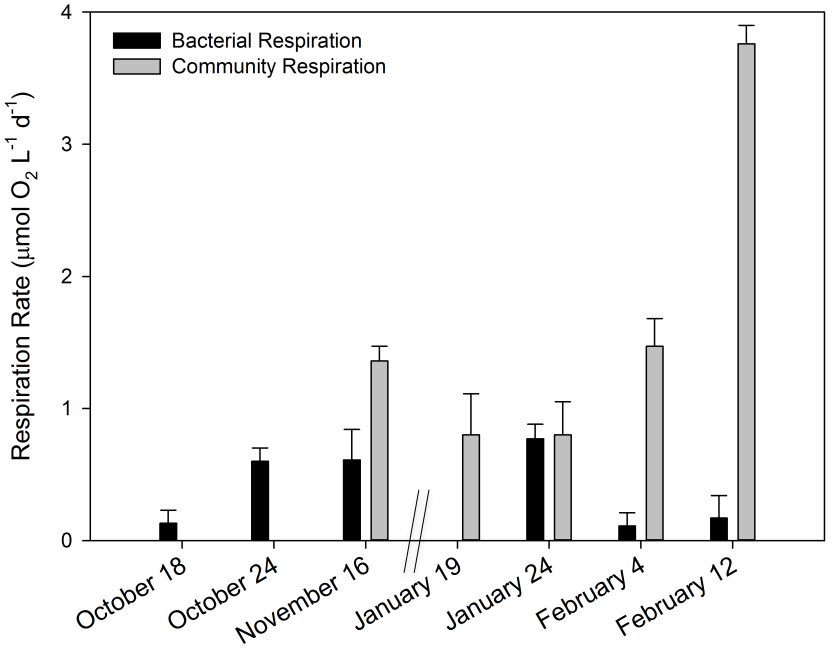
Figure 6. Relative contribution of each plankton group to carbon biomass (%) at the eight studied stations within the euphotic layer and the subeuphotic layer (defined as the layer extending 100 m below the euphotic depth, Ze). The color code ensures easy identification of autotrophic and heterotrophic organisms: blue–green colors are associated to autotrophic organisms while heterotrophic organisms are represented in red–orange.

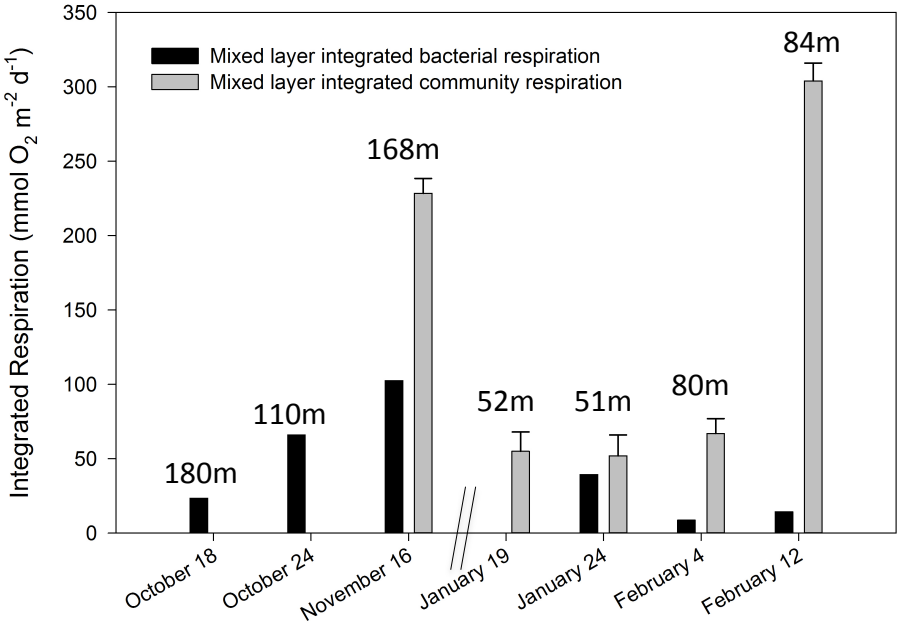
Data KEOPS2

Lasbleiz et al. (2016)

Microbial Respiration

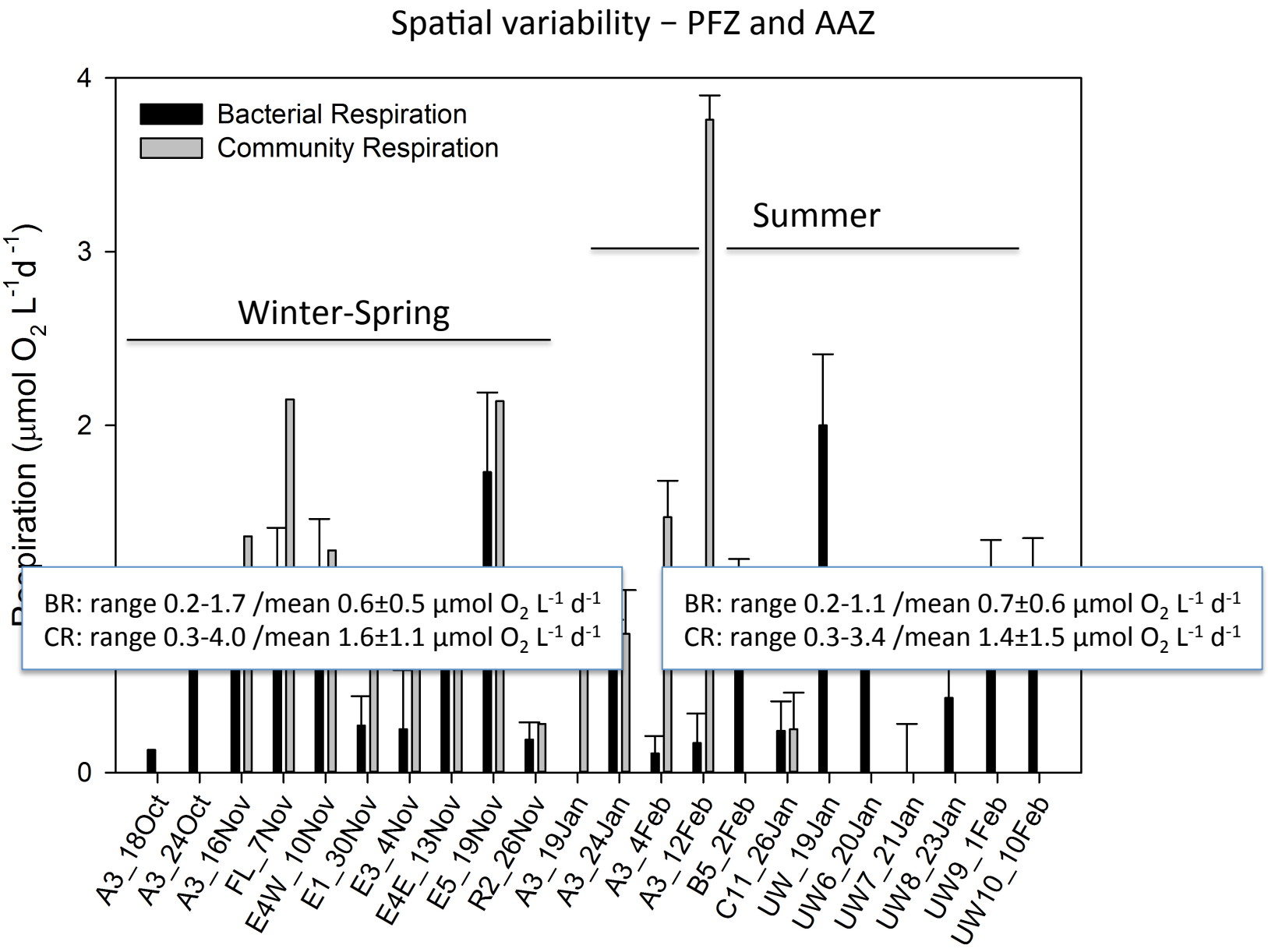
Focus on station A3: Temporal variability





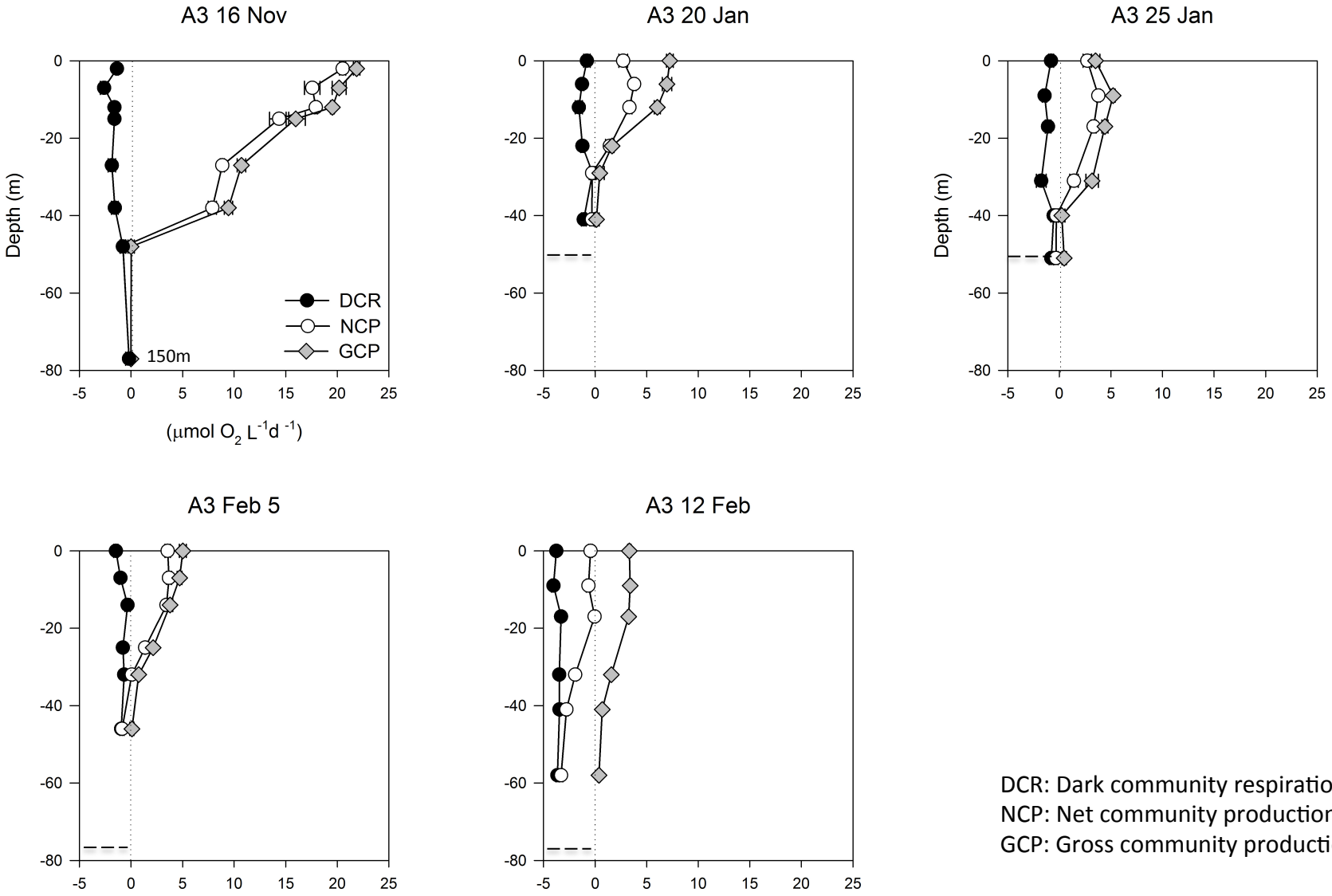
Bacterial respiration (< 0.8 µm size fraction): range 0.2-0.8 µmol O_2 L^{-1} d^{-1}
Community respiration (< 50 µm size fraction): range 0.8-3.8 µmol O_2 L^{-1} d^{-1}

Data: SOCLIM, KEOPS1&2 (D. Lefèvre)



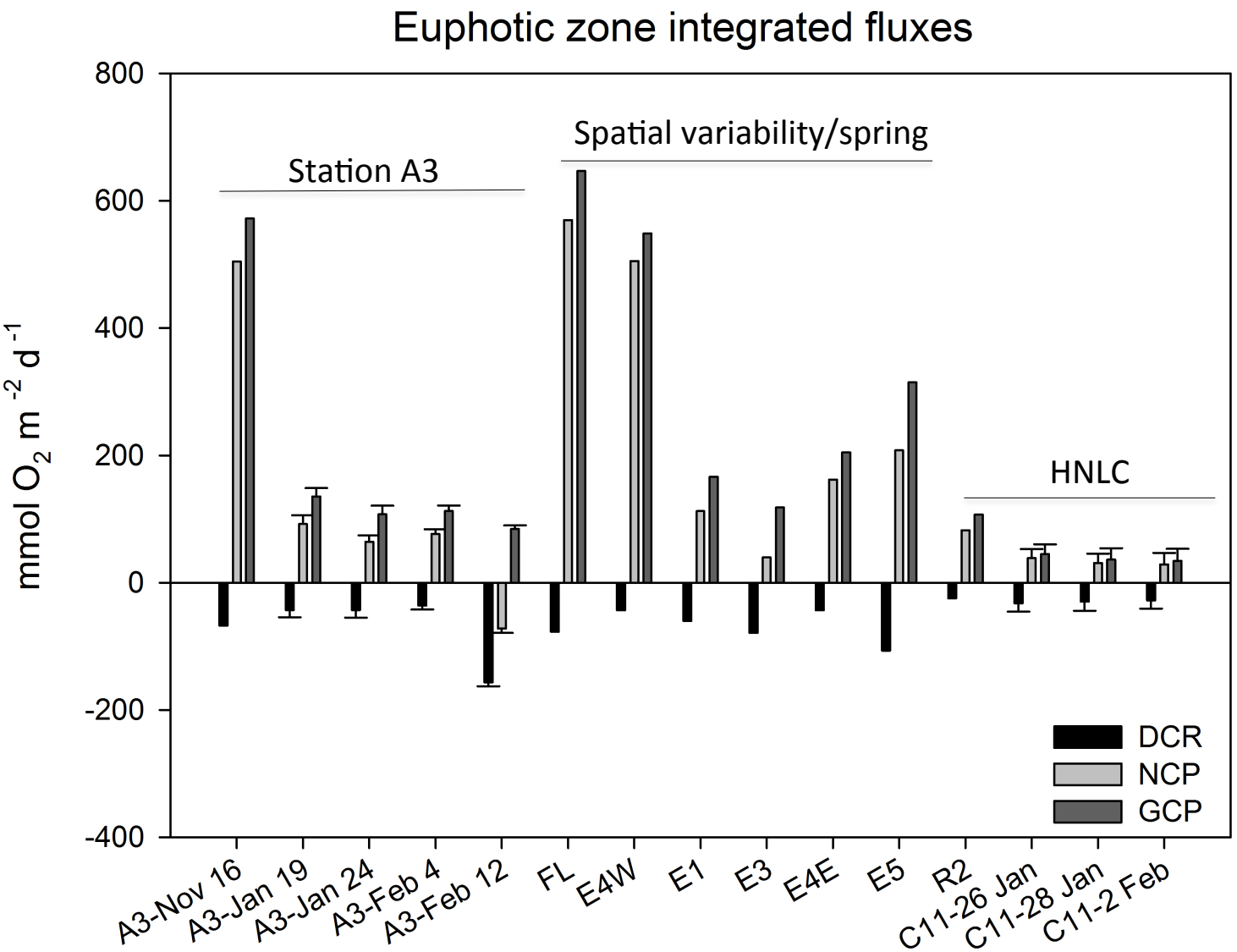
Data: SOCLIM, HEOBI, KEOPS1&2 (D. Lefèvre)

Community respiration and net community production: Station A3



DCR: Dark community respiration
NCP: Net community production
GCP: Gross community production

Lefèvre et al. (2008), Data KEOPS2, D. Lefèvre



Lefèvre et al. (2008), Data KEOPS2, D. Lefèvre

Photosynthetic and Respiratory Quotients

$PQ = GCP\ (O_2)/GCP(TCO_2)$
$RQ = DCR\ (TCO_2)/DCR(O_2)$

January-February

Table 2
Photosynthetic (PQ) and respiratory quotients (RQ)

Station	PQ ($n = 6$)	RQ ($n = 6$)
A3-1	0.82 ± 0.37	1.29 ± 0.85
A3-3	1.28 ± 0.31	0.89 ± 0.61
A3-4	1.26 ± 0.66	0.83 ± 0.42
A3-5	0.77 ± 0.28	1.03 ± 0.18

Mean values $\pm$ SE are given.

Lefèvre et al. (2008)

November

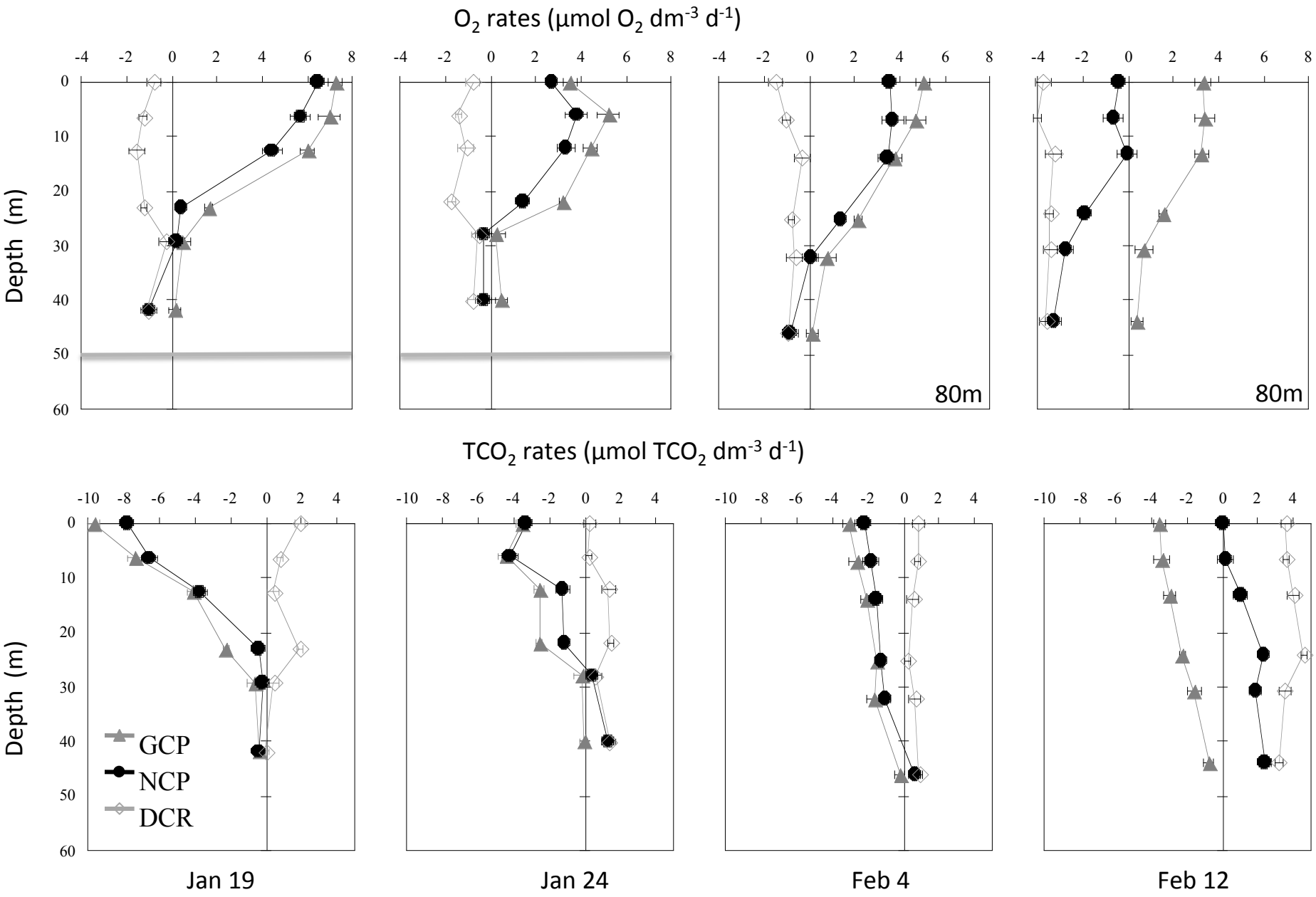
Station A3 PQ=4.12±1.2 RQ=1.01±0.67

Data KEOPS2, D. Lefèvre

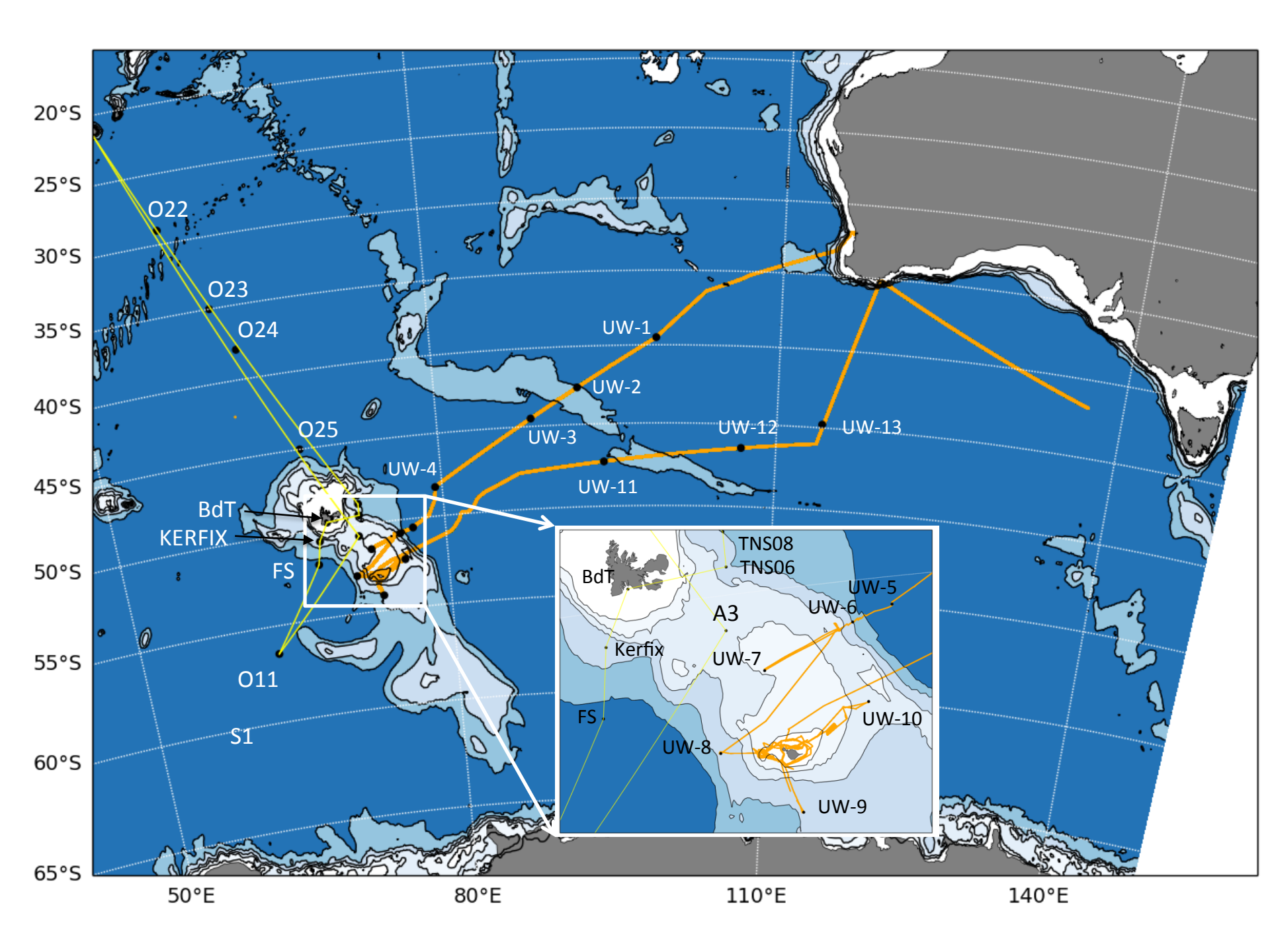
Summary

- Autotrophic and heterotrophic microbial abundance and biomass (0.2-200 μm) in the study region in spring and summer
- Community composition of prokaryotes and microplankton (samples for pico-naneukaryotes available)
- Microbial respiration and production measurements in the study region in spring and summer

Gross Community Production, Net Community Production and Community Respiration at Station A3



Lefèvre et al. (2008)


20°S
25°S
30°S
35°S
40°S
45°S
50°S
55°S
60°S
65°S
50°E
80°E
110°E
140°E
O22
O23
O24
O25
O11
S1
BdT
KERFIX
FS
UW-1
UW-2
UW-3
UW-4
UW-11
UW-12
UW-13
TNS08
TNS06
BdT
A3
UW-5
UW-6
Kerfix
UW-7
FS
UW-10
UW-8
UW-9