

Microbial growth and organic matter cycling in the Pacific Ocean along a latitudinal transect between subarctic and subantarctic waters

Helge-Ansgar Giebel¹, Carol Arnosti², Thomas H. Badewien¹, Insa Bakenhus¹, John Paul Balmonte^{2,3}, Sara Billerbeck¹, Leon Dlugosch¹, Rohan Henkel¹, Birgit Kuerzel¹, Jens Meyerjürgens¹, Felix Milke¹, Daniela Voss¹, Gerrit Wienhausen¹, Matthias Wietz^{1,4}, Holger Winkler¹, Mathias Wolterink¹, Meinhard Simon^{1,5#}

¹ Institute for Chemistry and Biology of the Marine Environment, University of Oldenburg,
Carl von Ossietzky Str. 9-11, D-26129 Oldenburg, Germany

² Department of Marine Sciences, University of North Carolina at Chapel Hill,
3202 Venable Hall, Chapel Hill, NC 27599, USA

³ present address: HADAL & NordCEE, Department of Biology, University of Southern
Denmark, Campusvej 55, 5230 Odense, Denmark,

⁴ present address: Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research,
Am Handelshafen, D-27570 Bremerhaven, Germany

⁵ Helmholtz Institute for Functional Marine Biodiversity at the University of Oldenburg
(HIFMB), Ammerländer Heerstr. 231, D-26129 Oldenburg, Germany

correspondence: m.simon@icbm.de

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Microbial growth dynamics along a Pacific transect

Supporting Information

Table S1

Figures S1-S9

Table S1

Number, latitude, longitude, total water depth, date of sampling and province of stations visited during cruises SO248 and SO254 with RV Sonne along a transect across the Pacific Ocean in 2016 and 2017. For abbreviations of provinces see Figure S9.

Station	Latitude	Longitude	Depth	Date	Province
			(m)	(MM/DD/YYYY)	
25	52.12°S	177.53°E	5008	02/15/2017	SANT
24	50.48°S	179.44°E	4453	02/14/2017	SANT
23	45.95°S	179.38°E	3101	02/11/2017	SANT
22	40.59°S	179.27°E	3089	02/09/2017	SSTC
21	34.73°S	179.26°W	4621	02/06/2017	SPSG
20	30.10°S	179.82°E	566	02/01/2017	SPSG
1	30.00°S	177.00°E	4268	05/02/2016	SPSG
2	27.00°S	178.21°E	4197	05/03/2016	SPSG
3	15.00°S	178.00°W	1527	05/06/2016	SPSG
4	10.33°S	176.47°W	4129	05/08/2016	SPSG
5	05.00°S	178.32°W	6032	05/09/2016	SPSG
6	00.00°S	180.00°E	5262	05/11/2016	PEQD
7	04.66°N	179.40°E	6230	05/13/2016	PNEQ
8	11.00°N	179.00°E	5213	05/15/2016	NPTG
9	16.00°N	179.00°E	5179	05/17/2016	NPTG
10	22.00°N	178.32°E	2756	05/18/2016	NPTG
11	28.00°N	177.33°E	5156	05/20/2016	NPTG
12	34.00°N	177.33°E	3517	05/21/2016	NPSG
13	40.00°N	177.33°E	5647	05/23/2016	NPFF
14	45.00°N	178.45°E	5909	05/24/2016	NPFF
15	47.50°N	179.13°E	5854	05/25/2016	PSAG
16	50.00°N	179.55°E	5631	05/26/2016	PSAG
17	54.00°N	179.58°E	727	05/28/2016	BERS
18	57.00°N	179.58°E	3815	05/29/2016	BERS

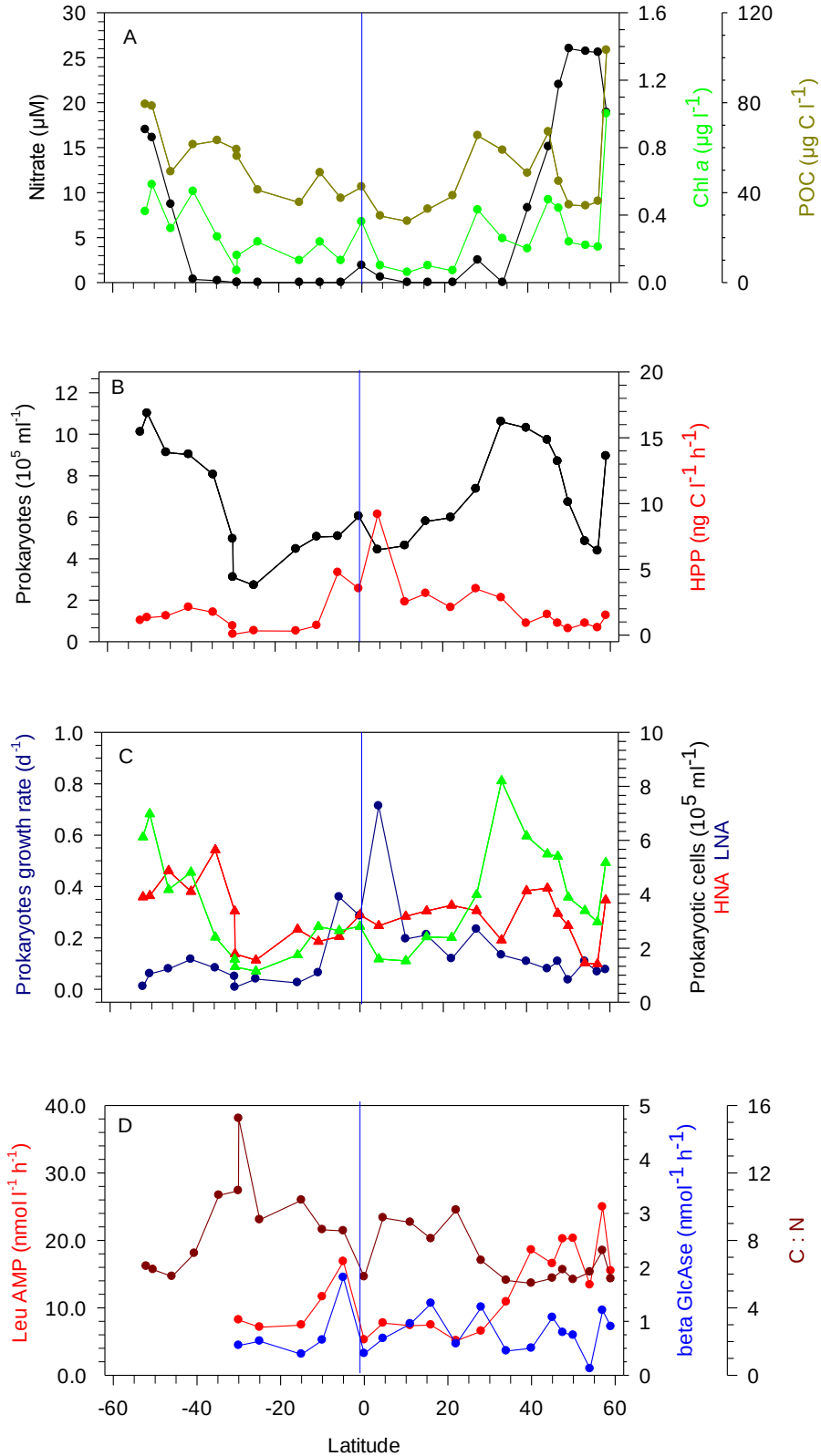


Figure S1: A: Concentrations of nitrate, Chl *a* and POC at 60 m depth along the transect between 52°S and 59°N across the Pacific Ocean. B: Prokaryotic cell numbers and heterotrophic prokaryotic production (HPP). C: Growth rate and cell numbers of prokaryotic High (HNA) and Low Nucleic Acid (LNA) cells: D: Hydrolysis rates of leucine amino peptidase (Leu-AMP) and β -glucosidase (β -GlcAse).

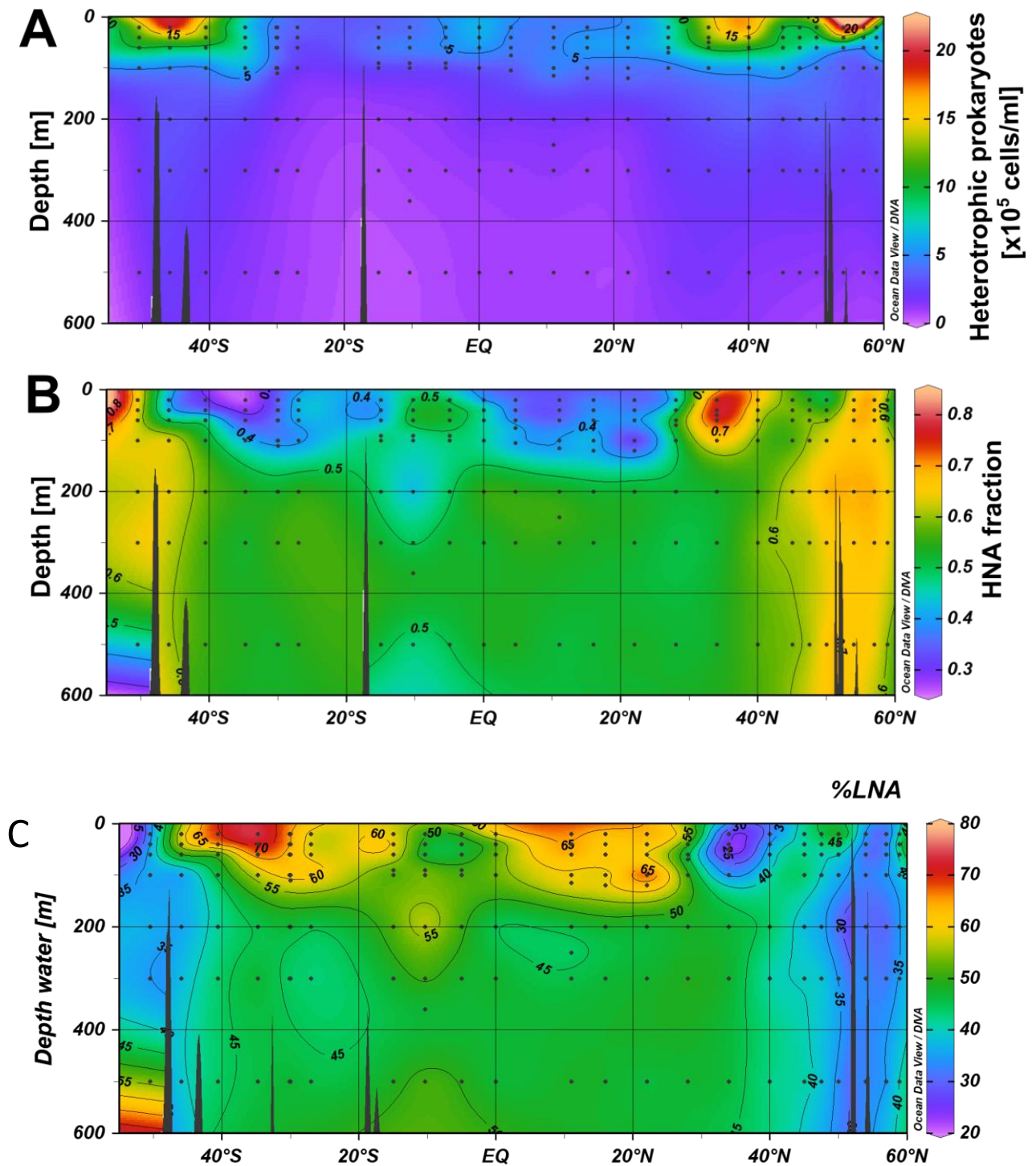


Figure S2: Contour graphs of the abundance of heterotrophic prokaryotes (A), the fraction of High Nucleic Acid (HNA, B) and Low Nucleic Acid (LNA, C) in the upper 500 m along the transect between 52°S to 59°N across the Pacific Ocean. Black dots indicate the depths of the 25 stations at which the samples for the measurements were collected.

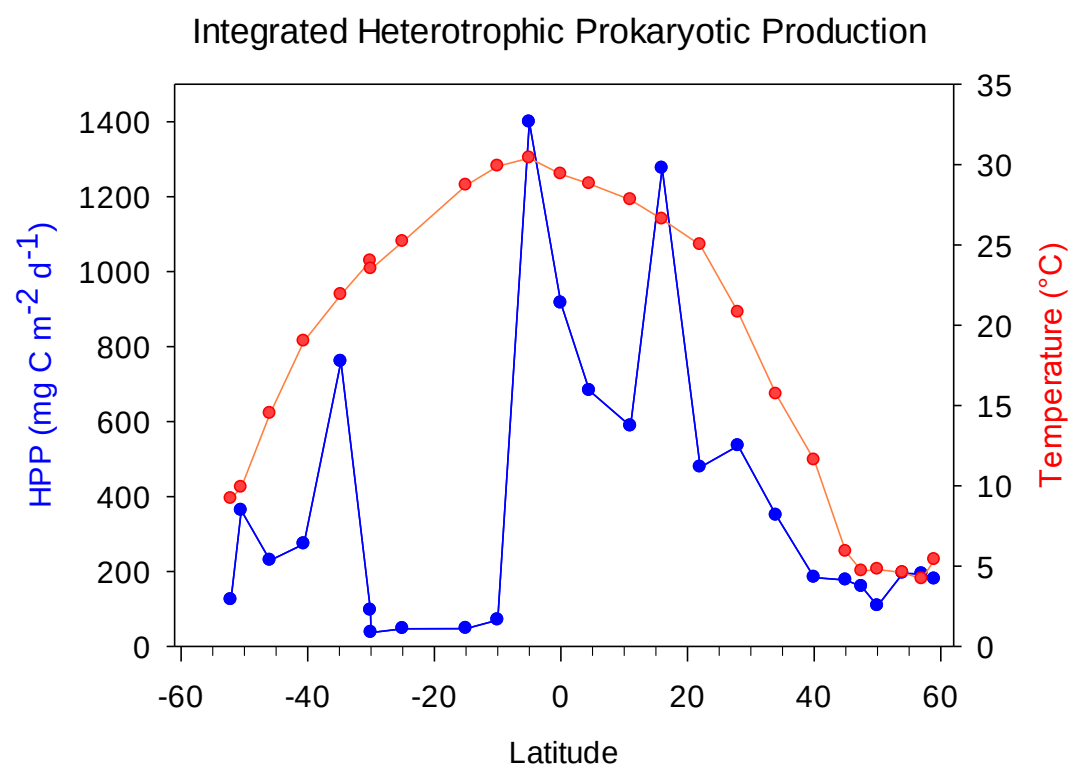


Figure S3: Heterotrophic prokaryotic production (HPP) integrated from 0 to 300 m depth and sea surface temperature along the transect between 52°S and 59°N in the Pacific Ocean.

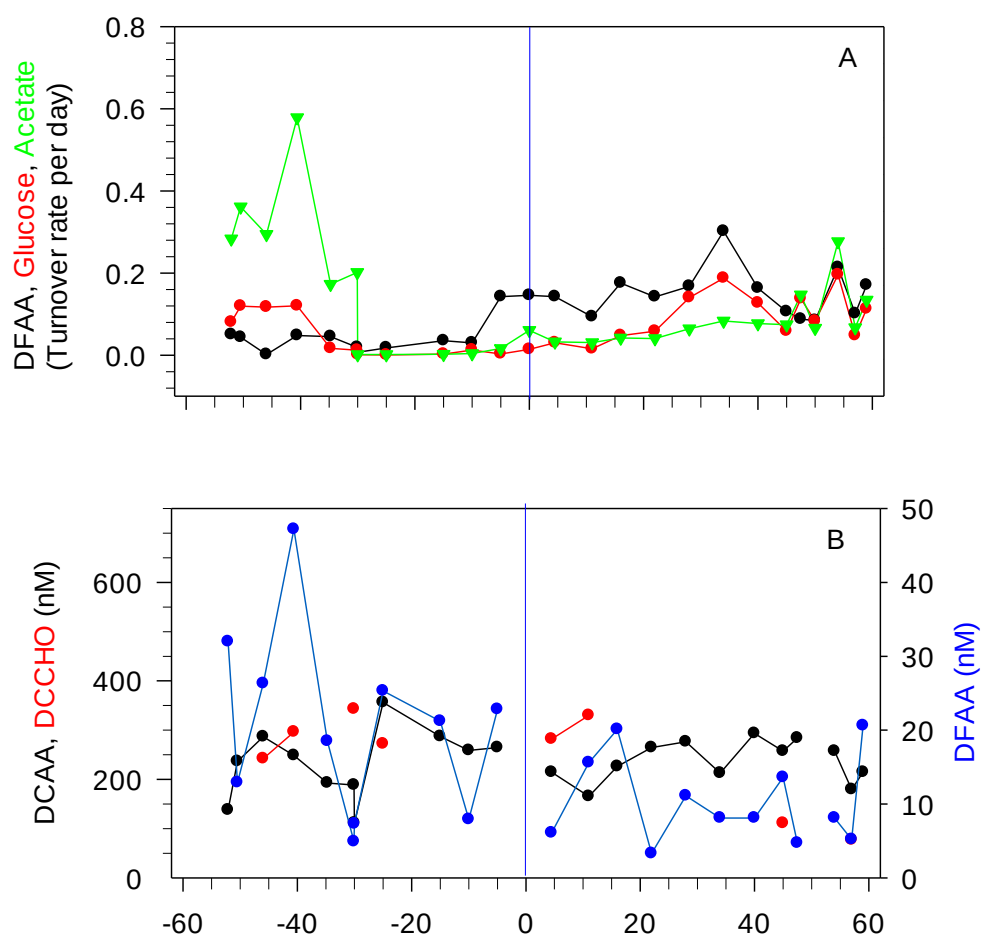


Figure S4: Turnover rate constants of DFAA, glucose and acetate at 60 m depth (A) and concentrations of DFAA, DCAA and DCCHO at 60 m depth (B) along the transect between 52°S and 59°N in the Pacific Ocean.

Bering Sea, station 17

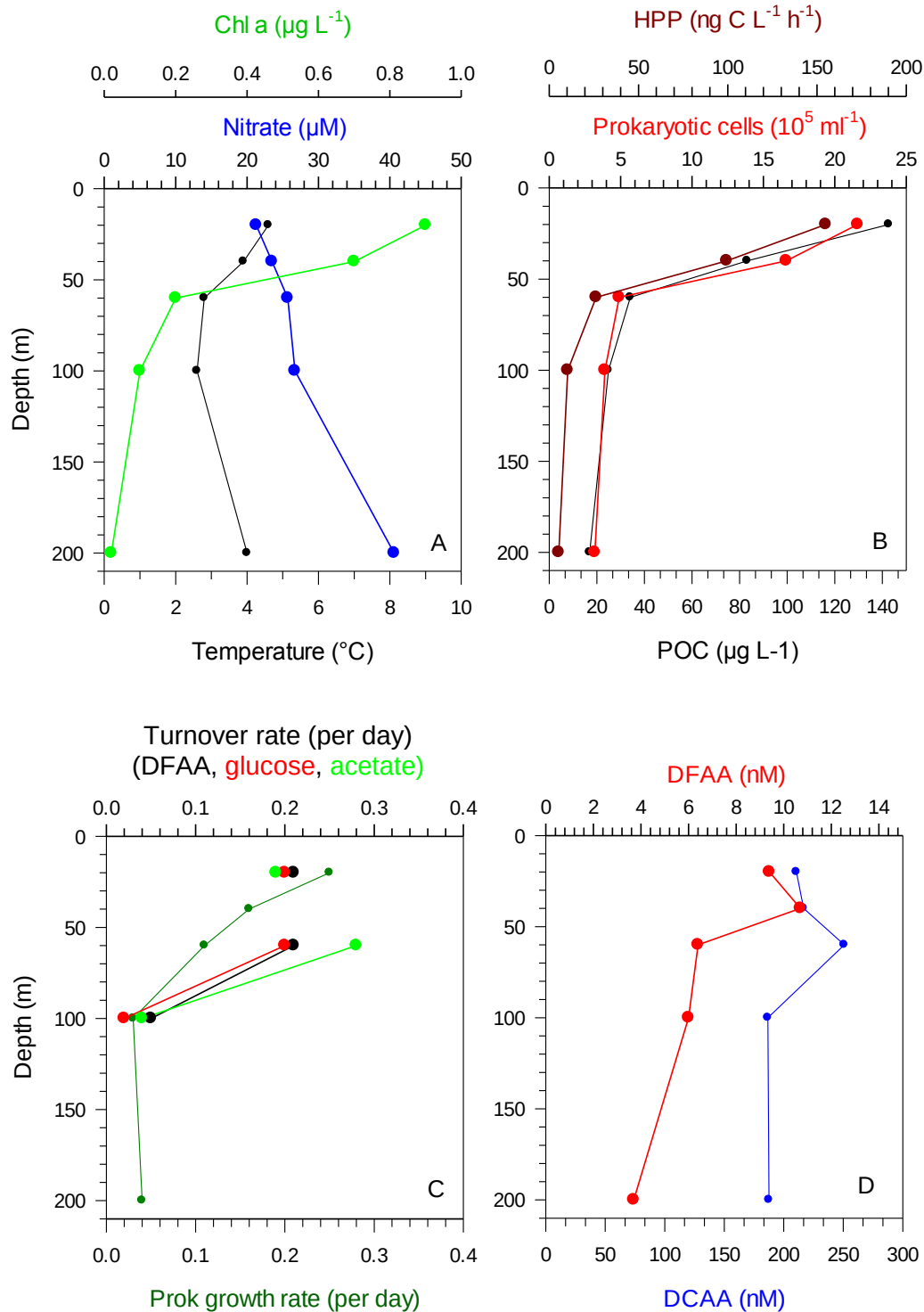


Figure S5: Depth profiles between 20 and 200 m of temperature, nitrate, Chl *a* (A), POC, prokaryotic cell numbers and HPP (B), turnover rate constants of DFAA, glucose and acetate and growth rates (C) and concentrations of DFAA and DCAA at station 17 in the BERS.

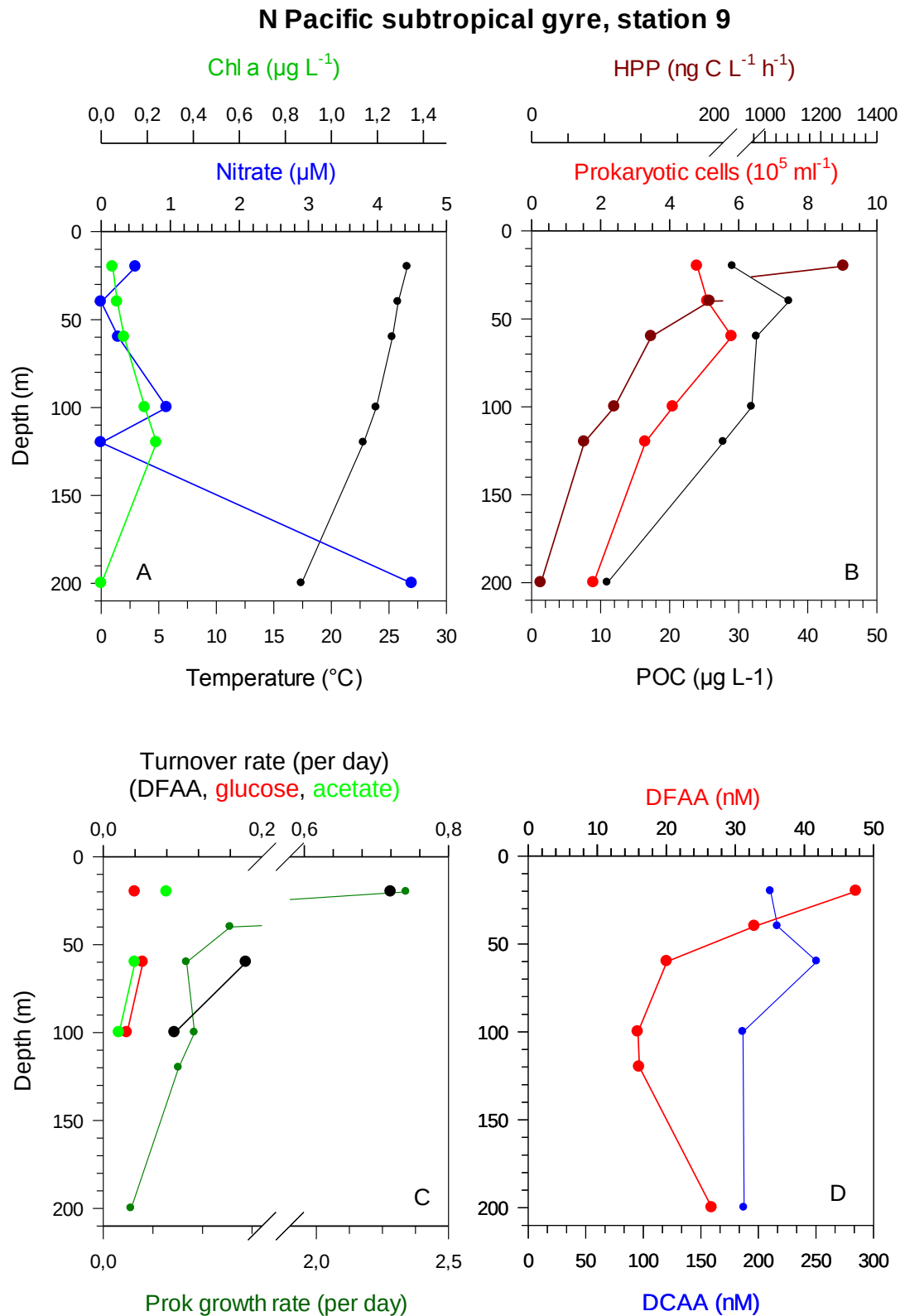


Figure S6: Depth profiles between 20 and 200 m of temperature, nitrate, Chl *a* (A), POC, prokaryotic cell numbers and HPP (B), turnover rate constants of DFAA, glucose and acetate and growth rates (C), and concentrations of DFAA and DCAA at station 9 in the NPSG.

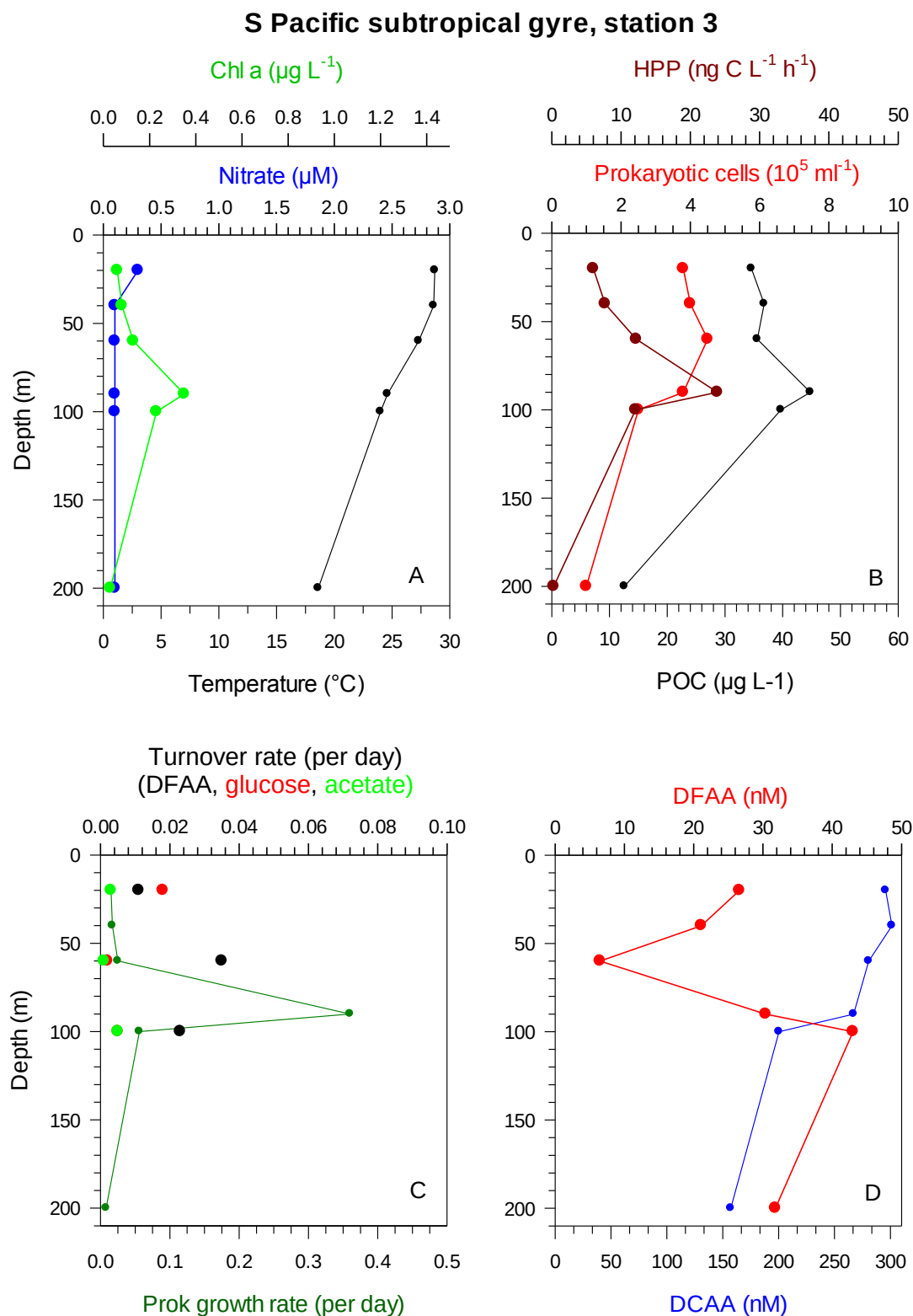


Figure S7: Depth profiles between 20 and 200 m of temperature, nitrate, Chl *a* (A), POC, prokaryotic cell numbers and HPP (B), turnover rate constants of DFAA, glucose and acetate and growth rates (C), and concentrations of DFAA and DCAA at station 3 in the SPSG.

Subantarctic Pacific, station 24

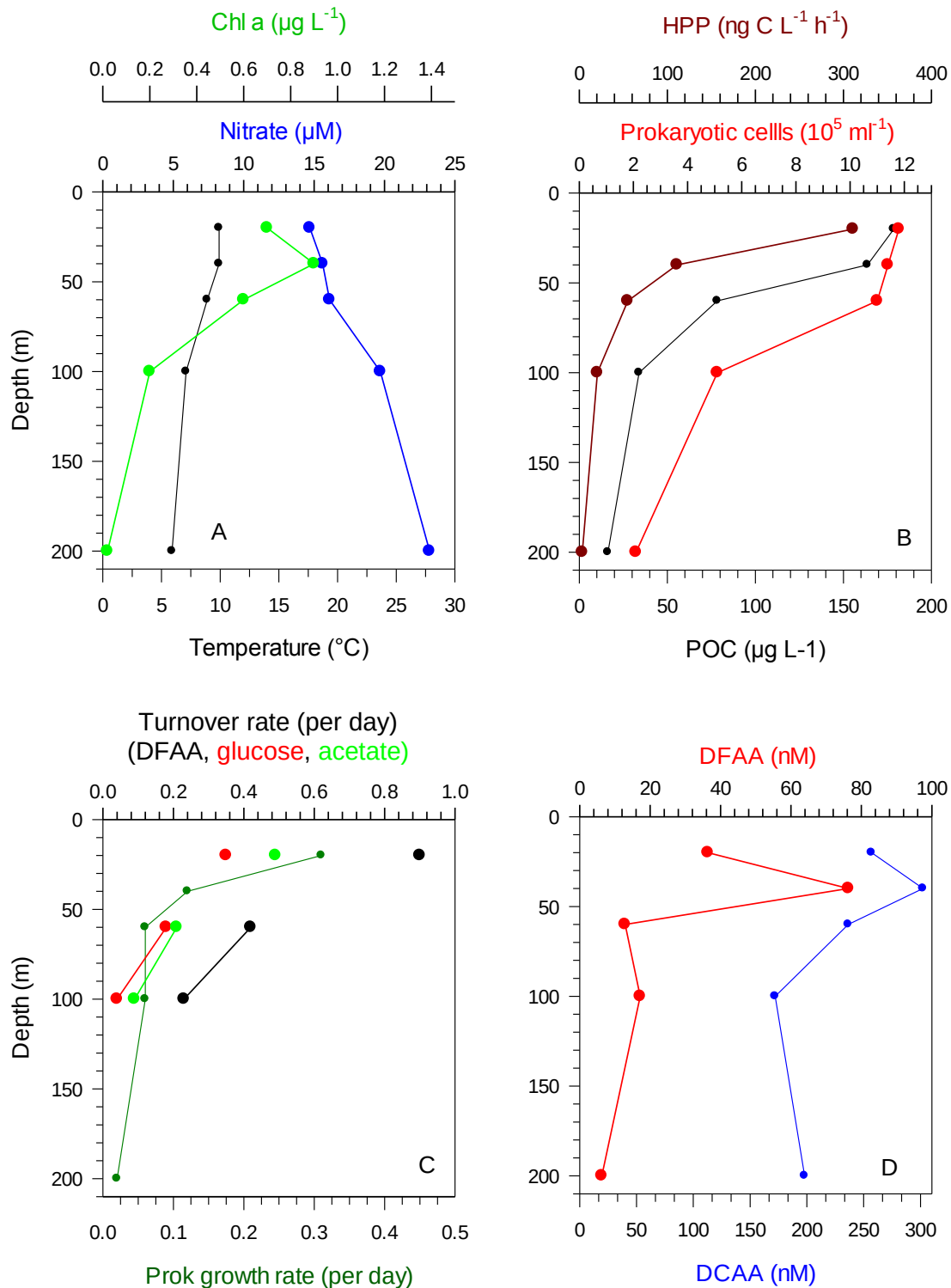


Figure S8: Depth profiles between 20 and 200 m of temperature, nitrate, Chl *a* (A), POC, prokaryotic cell numbers and HPP (B), turnover rate constants of DFAA, glucose and acetate and growth rates (C), and concentrations of DFAA and DCAA at station 24 in the SANT.

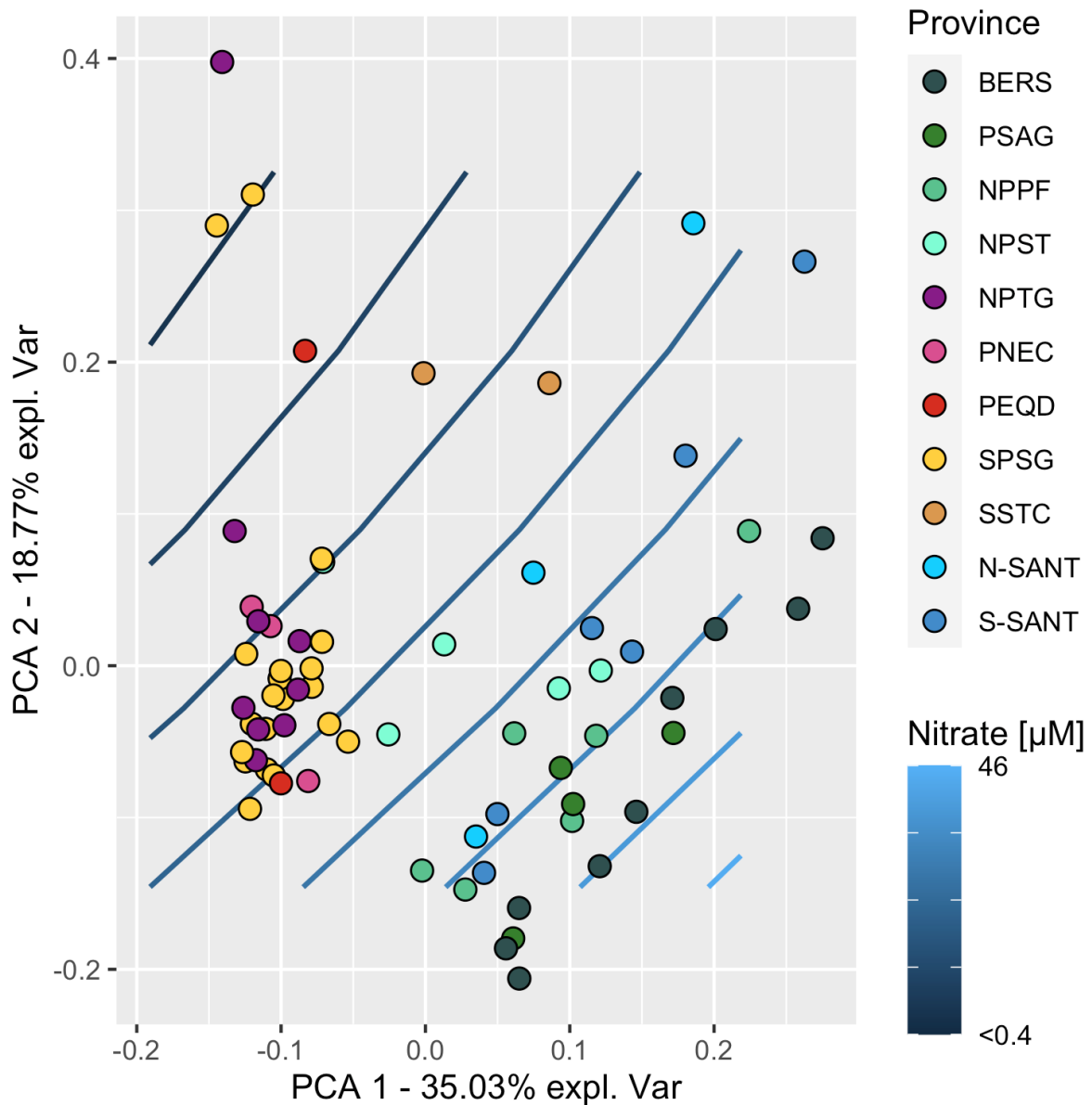


Figure S9: PCA analysis including all data collected in the upper 100 m or the depth of the DCM when below 100 m of 25 stations along the transect between 52°S and 59°N in the Pacific Ocean encompassing 10 biogeographic provinces. Blue lines indicate the interpolated gradient of nitrate concentrations between 0.1 to 25 μM along the transect. Each circle represents the data of one depth (20, 40, 60, 100 m, DCM) at a single station. The color code refers to the affiliated biogeographic province. BERS: Bering Sea; PSAG: Pacific subarctic gyre; NPPF: North Pacific polar frontal region; NPST: North Pacific subtropical gyre; NPTG: North Pacific tropical gyre; PNEQ: Pacific north equatorial current; PEQD: Pacific equatorial divergence; SPSG: South Pacific subtropical gyre; SSTC: South subtropical convergences; SANT: subantarctic province (Northern and Southern region separated by the subantarctic front). Blue lines indicate the interpolated nitrate concentrations between <0.4 and 46 μM along the transect. For abbreviations see legend of Fig. 1.