General project information

Project	CarbonBridge - Briding marine productivity regimes: How Atlantic advective inflow affects productivity, carbon cycling and export in a melting Arctic Ocean
Funding	Norwegian Research Council (NFR)
NFR project-ID	226415
RIS-ID	6637 (http://www.researchinsvalbard.no/project/7215)
CRIStin-ID	412717 (https://www.cristin.no/app/projects/show.jsf?id=412717)
Sampling area	west and north of Svalbard

Data information

Station name	name of stations sampled ("D"-stations are situated along a transect west off Svalbard, "C" and "E"-transects are situated northwest off Svalbard, and "B"-transect north off Svalbard)
Date/Time	provided in ISO-format (e.g. 1954-04-07T13:34:11), with time being provided in Coordinated Universal Time (UTC)
Latitude	in decimal degrees (northern latitude)
Longitude	in decimal degrees (positive values: east of Greenwich; negative values: west of Greenwich)
Station depth	water depth at station sampled in meters
Sampling depth	depth in meters from which sample was retrieved
CTD file name	file name of the CTD cast accompanying the here presented data. The CTD data are available from the database of the Norwegian Polar Institute (www.npolar.no)
CTD-S	salinity recorded by a CTD (Seabird SBE 911 plus©) at the given depth
CTD-T	potential temperature in degrees Celsius recorded by a CTD (Seabird SBE 911 plus©) at the given depth
Sigma	water density, sigma, as kilogram per cubic meter (kg/m^3), calculated based on the salinity and temperature of the water at the given depth
NO3+NO2	concentration of nitrate and nitrite in micro molar (µM). For nutrient analysis, water samples were stored frozen in acid-washed plastic bottles, and analyzed with standard seawater methods, applying Flow Solution IV analyzer (OI Analytical) calibrated using reference seawater (Ocean Scientific International).

NH4	concentration of ammonium in micro molar (µM) was measured manually with the sensitive flurometric method (Holmes et al. 1999)
PO4	concentration of phosphate in micro molar (µM). For nutrient analysis, water samples were stored frozen in acid-washed plastic bottles, and analyzed with standard seawater methods, applying Flow Solution IV analyzer (OI Analytical) calibrated using reference seawater (Ocean Scientific International).
Si(OH)4	concentration of silicic acid in micro molar (µM). For nutrient analysis, water samples were stored frozen in acid-washed plastic bottles, and analyzed with standard seawater methods, applying Flow Solution IV analyzer (OI Analytical) calibrated using reference seawater (Ocean Scientific International).
total Chl a	concentration of total chlorophyll a (Chl a) in microgram per liter (µg/L). Chl a was determined fluorometrically (10-AU, Turner Designs) from triplicates of Whatmann GFF filters (pore size approx. 0.7µm) after extraction in 5 mL methanol at room temperature in the dark for 12 h without grinding.
Chl a > 10 µm	concentration of chlorophyll a (Chl a) larger than 10µm in microgram per liter (µg/L). Chl a was determined fluorometrically (10-AU, Turner Designs) from triplicate membrane filters of 10 µm pore size (Whatman Nuclepore Track-Etch membrane) after extraction in 5 mL methanol at room temperature in the dark for 12 h without grinding.
total Phaeo	concentration of total phaeophytine (Phaeo) in microgram per liter (µg/L). Chl a was determined fluorometrically (10-AU, Turner Designs) from triplicates of Whatmann GFF filters (pore size approx. 0.7µm) after extraction in 5 mL methanol at room temperature in the dark for 12 h without grinding.
Phaeo > 10 µm	concentration of phaeophytine (Phaeo) larger than 10µm in microgram per liter (µg/L). Chl a was determined fluorometrically (10-AU, Turner Designs) from triplicate membrane filters of 10 µm pore size (Whatman Nuclepore Track-Etch membrane) after extraction in 5 mL methanol at room temperature in the dark for 12 h without grinding.
POC	concentration of particulate organic carbon (POC) in microgram per liter (µg/L). For analysis of POC, triplicate subsamples (100 - 500 mL) were filtered onto precombusted Whatman GF/F glass-fiber filters (450°C for 5 h), dried at 60oC for 24 h and analyzed on-shore with a Leeman Lab CEC 440 CHN analyzer. Prior to analysis, the dried samples were fumed by concentrated HCl in 24 h before re-drying at 60°C for 24 h to remove inorganic carbon.

PON	concentration of particulate organic nitrogen (PON) in microgram per liter (µg/L). For analysis of PON, triplicate subsamples (100 - 500 mL) were filtered onto precombusted Whatman GF/F glass-fiber filters (450°C for 5 h), dried at 60oC for 24 h and analyzed on-shore with a Leeman Lab CEC 440 CHN analyzer. Prior to analysis, the dried samples were fumed by concentrated HCl in 24 h before re-drying at 60°C for 24 h to remove inorganic carbon.
POC/PON	ratio of particulate organic carbon to particulate organic nitrogen based on atom to atom
PP-part	particulate primary production in microgram carbon per liter and day (µg C/L/d), determined from in-situ water incubations spiked with 14-bicarbonate (10 µC) and analyzed from Whatman GF/F filters with a Perkin Elmer scintillation counter (Tri-Carb 2900TR). For more detail see Vernet et al. 1998
PP-total	total primary production (i.e. both particulate and dissolved) in microgram carbon per liter and day (µg C/L/d), determined from in-situ water incubations spiked with 14-bicarbonate (10 µC) and analyzed from 2 mL water sample with a Perkin Elmer scintillation counter (Tri-Carb 2900TR). For more detail see Vernet et al. 1998
NH4-uptake	ammonium uptake in microgram ammonium per liter and day (µg NH4/L/d), determined form in-situ water incubations spiked with 15N-ammunium (0.1 µM) and analyzed from Whatman GF/F filters with an elemental analyzer (ECS 4010, Costech Analytical Technologies Inc.) coupled to a mass spectrometer (Delta V Advantage, ThermoFinnigan). See Randelhoff et al. (2016) for more details.
NO3-uptake	nitrate uptake in microgram nitrate per liter and day (µg NO3/L/d), determined form in-situ water incubations spiked with 15N-nitrate (0.1 µM) and analysed from Whatman GF/F filters with an elemental analyzer (ECS 4010, Costech Analytical Technologies Inc.) coupled to a mass spectrometer (Delta V Advantage, ThermoFinnigan). See Randelhoff et al. (2016) for more details.
f-ratio	fraction of total primary production fueled by nitrate (dimensionless ratio)
BP	bacterial production in microgram carbon per liter and day (µg C/L). BP was estimated from incorporation rates of 3H-labelled leucine, measured by standard methods (Kirchman, 2001). Leucine incorporation was converted into biomass production using a carbon fraction of proteins of 1.5, assuming no isotope dilution.
Chl a-flux	vertical export of chlorophyll a in milligram per square meter and day (mg Cha a/m^2/d), as was measured by a free-drifting sediment trap array. Chl a w as determined as specified for "Chl a" above.

Phaeo-flux	vertical export of phaeophytine in milligram per square meter and day (mg Phaeo a/m^2/d), as was measured by a free-drifting sediment trap array. Phaeophytine was determined as specified for "Phaeo" above.
POC-flux	vertical export of particulate organic carbon in milligram per square meter and day (mg POC/m^2/d), as was measured by a free-drifting sediment trap array. POC concentration was determined as specified for "POC" above.
PON-flux	vertical export of particulate organic nitrogen in milligram per square meter and day (mg PON/m^2/d), as was measured by a free-drifting sediment trap array. PON concentration was determined as specified for "PON" above.
POC/PON-flux	ratio of vertically exported particulate organic carbon to particulate organic nitrogen (atom to atom), as measured from a free-drifting sediment array.

References

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Randelhoff, A., Fer, I., Sundfjord, A., Tremblay, J.E., and Reigstad, M. (2016). Vertical fluxes of nitrate in the seasonal nitracline of the Atlantic sector of the Arctic Ocean. Journal of Geophysical Research-Oceans 121(7), 5282-5295. doi: 10.1002/2016jc011779.

Kirchman, D. (2001). Measuring bacterial biomass production and growth rates from leucine incorporation in natural aquatic environments. Methods in Microbiology, Vol 30 30, 227-237. doi: 10.1016/s0580-9517(01)30047-8.

Holmes, R. M., A. Aminot, R. Kerouel, B. A. Hooker, and B. J. Peterson (1999), A simple and precise method for measuring ammonium inmarine and freshwater ecosystems, Can. J. Fish. Aquat. Sci., 56(10), 1801–1808, doi:10.1139/f99-128.