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Cantoni, Carolina; Hopwood, Mark; Clarke, Jennifer; Chiggiato, Jacopo; Achterberg, Eric Pieter; Cozzi, Stefano (2019): Hydrological, biogeochemical and carbonate system data in coastal waters and in glacier drainage systems in Kongsfjorden (Svalbard), during July-August 2016. *PANGAEA*, https://doi.pangaea.de/10.1594/PANGAEA.904171 *(dataset in review)*,

Supplement to: Cantoni, C et al. (in review): Glacial drivers of marine biogeochemistry in an Arctic fjord (Kongsfjorden, Svalbard). *Science of the Total Environment*

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Abstract:

A detailed survey of a high Arctic fjord (Kongsfjorden, Svalbard), subjected to a large glacier discharge, was carried out from 24 July to 13 August 2016. Field activities addressed the identification of the effects of glacier and iceberg melting on the evolution of nutrient, dissolved organic matter and carbonate systems in this coastal marine environment. Hydrological (CTD downcasts) and biogeochemical (bottle sampling) data were collected during six oceanographic surveys in the inner area of the fjord, in concomitance to the annual phase of maximum air warming. An extensive sampling was also carried out in all glacier drainage systems located around the fjord and from several iceberg samples, in order to characterize all freshwater loads. The dataset includes hydrological data (T, Sal., density) carbonate chemistry data (pH, DIC, TA) and the concentrations of dissolved oxygen (DO), inorganic nutrients (NO3-, NO2-, NH4+, PO43-, SiO2), dissolved organic matter (DOC, DON) and some micronutrients (Fe, Mn).

Keyword(s):

Carbonate chemistry; glacier; Iceberg; nutrients; Ocean acidification; runoff

Related to:

Hopwood, Mark; Cantoni, Carolina; Cozzi, Stefano; Achterberg, Eric Pieter (2017): The heterogeneous nature of Fe delivery from melting icebergs. *Bulletin de lAssociation Française pour lÉtude du Quaternaire*, 200-209, https://doi.org/10.7185/geochemlet.1723

Hopwood, Mark; Dunse, Thorben; Iriarte, J L; Ribeiro, Sofia; Achterberg, Eric Pieter; Cantoni, Carolina; Chierici, Melissa; Cozzi, Stefano; Fransson, Agneta; Juul-Pedersen, Thomas (2019): Review Article: How does glacier discharge affect marine biogeochemistry and primary production in the Arctic? *The Cryosphere Discussions*, 1-51, https://doi.org/10.5194/tc-2019-136

Project(s):

OCEAN-CERTAIN (OCEAN-CERTAIN)

pH Tipping Point in Svalbard (pHinS)

Coverage:

Median Latitude: 78.954874 * *Median Longitude:* 12.296419 * *South-bound Latitude:* 78.864600 * *West-bound Longitude:* 11.765000 * *North-bound Latitude:* 79.008600 * *East-bound Longitude:* 12.582200

Date/Time Start: 2016-07-24T09:30:00 * *Date/Time End:* 2016-08-10T14:25:00

Comment:

Analytical methods

DO samples were analyzed by the Winkler method (Grasshoff et al., 1999) using an automated Metrohm 798 MPT Titrino potentiometric titration system (CV = 0.17 %at 210 µmol L-1).The determination of macronutrients was carried out following standard colorimetric methods (Grasshoff et al., 1999),using an OI-Analytical (Flow Solution III) autoanalyzer.Samples for the determination of DOC and TDN were analyzed by High-Temperature Catalytic Oxidation(HTCO) method, using a Shimadzu TOC-V analyzer equipped with a total nitrogen module TNM-1(Grasshoff et al., 1999). DOC was determined in triplicate (CV < 2 %) against potassium hydrogen phthalate standard solutionsusing a nondispersiveIR detector. TDN was determined in triplicate (CV < 2 %) by chemiluminescence,against potassium nitrate standard solutions. The total blank of the system and the efficiency of the oxidation step were checked daily by the analysis of ultra-pure Millipore Q water and standard solutions. All samples of TA and sediment rich pH samples were filteredprior the analysiswith 0.45 µm Durapore membrane using aperistaltic filtration, whichwas tested using CRM and low sediment fjord waters as reference (Bockmon &Dickson, 2014). DIC was measured using an infrared DIC analyzer (Apollo SciTech AS-C3) on an acidification and purging unit combined with a LI-COR 7000 CO2gas analyzer. TA was determined according to Dickson et al. (2007), using an automated open cell potentiometric titration system (Apollo AS-ALK2) equipped with a Thermo scientific combination electrode with the Orion 3* pH meter calibrated using buffers of 7 and 10 (Merck, Centipur buffers). Analytical precision (one-sigma; 1σ) was calculated as the absolute difference between sample duplicates divided by 2/√π (Thompson & Howarth, 1973)and it was equal to ± 3.8 and ± 1.7 µmol kg-1for DIC and TA, respectively.pH in marine samples was determined spectrophotometrically using m-cresole purple as indicator (Clayton & Byrne, 1993; Dickson et al., 2007) using 10 cm glass cells held in a thermostat bath at 20 ± 0.05 °C. pH values are reported on the total hydrogen ion scale at 20 °C (pHT20). For this parameter, the precision (1σ) determined on duplicate samples was ± 0.003 pH units (Thompson & Howarth, 1973). Unfiltered water was retained from Niskin bottles free from internal metal components, in pre-cleaned (1 week in 1 M HCl, 1 week in 1 M HNO3) 125 mL low density polyethylene bottles. Samples were then acidified to pH <1.9 by addition of 180 µL HCl (UPA grade ROMIL) and allowed to stand for >12 months. Samples were then diluted with 1 M HNO3distilled in house using a DST-1000 Savillex from SPA grade HNO3(ROMIL), and analysed by ICP-MS (ELEMENT XR, ThermoFisherScientific). For river and ice samples (S < 0.5), a Thermo Scientific glass electrode was used to determine the pH. It was calibrated, prior to use, at 20°C with buffers (Merck, Centipur buffers) at pH 7 and 10 and the values were reported on NBSscale (pHNBS20).Analytical methods used for the determination of the other chemical parameters in freshwater and melted ice samples were equivalent to those used for seawater samples.

Size:

3 datasets

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2. **Cantoni, C; Hopwood, M; Clarke, J et al. (2019):** Hydrological, biogeochemical and carbonate system data in coastal waters and in glacier drainage systems in Kongsfjorden (Svalbard), during July-August 2016: sea stations. https://doi.pangaea.de/10.1594/PANGAEA.904145
3. **Cantoni, C; Hopwood, M; Clarke, J et al. (2019):** Hydrological, biogeochemical and carbonate system data in coastal waters and in glacier drainage systems in Kongsfjorden (Svalbard), during July-August 2016: small icebergs. https://doi.pangaea.de/10.1594/PANGAEA.904170

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