Nitrate nitrogen and oxygen isotope hydrocast data from R/V Aurora Australis and RV Nathaniel B. Palmer cruises in the Southern oceans from 1997 to 2006 (CAREER project)

Website: https://www.bco-dmo.org/dataset/3571
Version: 7 December 2011
Version Date: 2011-12-07

Project
» CAREER: Nitrate Isotopes and Biogeochemistry; A Plan for coupling (CAREER)

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Dataset Description

Nitrate and oxygen isotope data from the Southern Ocean

Related files and references:

DiFiore, P. J., D. M. Sigman, T. W. Trull, M. J. Lourey, K. Karsh, G.Cane, and R. Ho (2006), Nitrogen isotope constraints on subantarctic biogeochemistry, J. Geophys. Res., 111, C08016, doi:10.1029/2005JC003216.

DiFiore, P. J., D. M. Sigman, and R. B. Dunbar (2009), Upper ocean nitrogen fluxes in the Polar Antarctic Zone: Constraints from the nitrogen and oxygen isotopes of nitrate, Geochem. Geophys. Geosyst.,10, Q11016, doi:10.1029/2009GC002468.

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Data Files

File
Hydrocasts.csv (Comma Separated Values (.csv), 49.72 KB) MD5:b84b061cd0a53afddcbcf5ab77fc83b7 Primary data file for dataset ID 3571

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Parameters

Parameter	Description	Units
cruise_ID	Cruise identifier	dimensionless
start_date	start date of dataset	YYYYMMDD
end_date	end date of data set	YYYYMMDD
date	date of sample	YYYYMMDD
lat	latitude	decimal degrees
lon	longitude	decimal degrees
cast	station number	dimensionless
time	Time of cast	HHMM
depth	depth of measurement	meters
Zmax	deepest sample depth	meters
NO3	Nitrate	micromoles/liter
dN15_NO3	delta 15N of dissolved nitrate relative to atmospheric N2	per mil
d180_NO3	delta_180_NO3	per mil vs. SMOW

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Deployments

AU9701

Website	https://www.bco-dmo.org/deployment/58734
Platform	R/V Aurora Australis
Report	http://data.aad.gov.au/aadc/voyages/display_voyage.cfm?voyage_id=81
Start Date	1997-09-09
End Date	1997-09-22

NBP0101

Website	https://www.bco-dmo.org/deployment/58743
Platform	RVIB Nathaniel B. Palmer
Report	http://www.marine-geo.org/tools/search/entry.php?id=NBP0101
Start Date	2001-01-30
End Date	2001-03-28

AU9706

Website	https://www.bco-dmo.org/deployment/58744
Platform	R/V Aurora Australis
Report	http://data.aad.gov.au/aadc/voyages/display_voyage.cfm?voyage_id=84
Start Date	1998-02-28
End Date	1998-04-01

AU9901

Website	https://www.bco-dmo.org/deployment/58746
Platform	R/V Aurora Australis
Report	http://data.aad.gov.au/aadc/voyages/display_voyage.cfm?voyage_id=92
Start Date	1999-07-13
End Date	1999-10-07

NBP0608

Website	https://www.bco-dmo.org/deployment/57986
Platform	RVIB Nathaniel B. Palmer
Report	http://data.bco-dmo.org/CORSACS/cruises/Dunbar_Hydrography_report_NBP0608.pdf
Start Date	2006-11-01
End Date	2006-12-15
Description	This was the second of two Controls of Ross Sea Algal Community Structure (CORSACS) project cruises and was funded by the NSF Office of Polar Programs. The NBP0608 cruise was conducted in the Ross Sea in November and December 2006, ca. 65.21°S-78.65°S, 164.98°E-164.70°W. Related files: Cruise track map (PDF file) Related Sites: MGDS catalog: http://www.marine-geo.org/tools/search/entry.php?id=NBP0608

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Project Information

CAREER: Nitrate Isotopes and Biogeochemistry; A Plan for coupling (CAREER)

Coverage: Subantarctic waters, Antarctic Zone, and Ross Sea

Nitrate is a ubiquitous form of biologically available nitrogen in the environment. Based on previous method development in the principal investigator's laboratory, CAREER graduate students and undergraduates

investigate the nitrogen (N) and oxygen (O) isotopes of nitrate as 'tracers' of the N cycle, focusing on the marine environment. Research centers on two projects: (1) lab culture, in vitro assay, and field incubation studies of the coupled N and O isotope dynamics of nitrate assimilation and denitrification, two of the critical reactions in the N cycle; and (2) incorporation of the N and O isotopes of nitrate into numerical models of ocean circulation and biogeochemistry. These projects, in the context of the oceanic data sets generated in the principal investigator's laboratory, allow for the quantification of biogeochemical processes the signals of which are otherwise complicated by their simultaneous occurrence and by ocean circulation.

Oceanic data used in this project includes Nitrogen and delta 15N of dissolved nitrate relative to atmospheric N2 (dN15_NO3) collected during five cruises in the Southern Ocean -- in September, 1997, March, 1998, and August, 1998, February, 2001, and November 2006. During the last two cruises, samples of Oxygen isotopic composition (18O/16O) of nitrate (d18O_NO3) were also collected.

Related files and references:
DiFiore, P. J., D. M. Sigman, T. W. Trull, M. J. Lourey, K. Karsh, G.Cane, and R. Ho (2006), Nitrogen isotope constraints on subantarctic biogeochemistry, J. Geophys. Res., 111, C08016, doi:10.1029/2005JC003216.

DiFiore, P. J., D. M. Sigman, and R. B. Dunbar (2009), Upper ocean nitrogen fluxes in the Polar Antarctic Zone: Constraints from the nitrogen and oxygen isotopes of nitrate, Geochem. Geophys. Geosyst.,10, Q11016, doi:10.1029/2009GC002468.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0447570
NSF Division of Ocean Sciences (NSF OCE)	OCE-0081686
NSF Antarctic Sciences (NSF ANT)	ANT-0453680

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