

# Nitrate nitrogen and oxygen isotope data from the underway acquisition system from R/V Aurora Australis and R/V Southern Surveyor cruises in the Southern Ocean from 1997 to 1999 (CAREER project)

**Website:** <https://www.bco-dmo.org/dataset/3595>

**Version:** 26 February 2012

**Version Date:** 2011-02-26

## Project

» [CAREER: Nitrate Isotopes and Biogeochemistry; A Plan for coupling](#) (CAREER)

Contributors	Affiliation	Role
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## Data Files

File
<b>Underway.csv</b> (Comma Separated Values (.csv), 9.67 KB) MD5:44f0ef55ddf82ebc85dedb7aa0264601
Primary data file for dataset ID 3595

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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
time	Time of cast	HHMM
NO3	Nitrate	micromoles/liter
d15N_NO3	delta 15N of dissolved nitrate relative to atmospheric N2	per mil

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## Deployments

### AU9701

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

### AU9901

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

### SS9902

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/58747">https://www.bco-dmo.org/deployment/58747</a>
<b>Platform</b>	R/V Southern Surveyor
<b>Report</b>	<a href="http://www.marine.csiro.au/maru/marlin_admin.survey_details?srv_id=623&amp;src_id=8&amp;rscr=plst">http://www.marine.csiro.au/maru/marlin_admin.survey_details?srv_id=623&amp;src_id=8&amp;rscr=plst</a>
<b>Start Date</b>	1999-02-06
<b>End Date</b>	1999-02-14

#### AU9804

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/58745">https://www.bco-dmo.org/deployment/58745</a>
<b>Platform</b>	R/V Aurora Australis
<b>Report</b>	<a href="http://data.aad.gov.au/aadc/voyages/display_voyage.cfm?voyage_id=91">http://data.aad.gov.au/aadc/voyages/display_voyage.cfm?voyage_id=91</a>
<b>Start Date</b>	1998-10-29
<b>End Date</b>	1998-12-27

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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 N<sub>2</sub> (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 (d180\_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

<b>Funding Source</b>	<b>Award</b>
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-0447570</a>
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-0081686</a>
<a href="#">NSF Antarctic Sciences (NSF ANT)</a>	<a href="#">ANT-0453680</a>

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