Chemistry - May 2007 from R/V Akvanavt AV2007_May in the North East Black Sea from May 2007 (Anammox Black Sea project)

Website: https://www.bco-dmo.org/dataset/3492
Version: 20 June 2011
Version Date: 2011-06-20

Project
» Anammox, denitrification and nitrogen fixation in the Black Sea (Anammox Black Sea)

Contributors	Affiliation	Role
Staley, James	University of Washington (UW)	Principal Investigator
Murray, James W.	University of Washington (UW)	Co-Principal Investigator
Gegg, Stephen R.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Table of Contents

- Dataset Description
- Data Files
- Parameters
- Instruments
- Deployments
- Project Information
- Funding

Dataset Description

Chemistry collected during the May 2007 cruise

[table of contents | back to top]

Data Files

File
May2007_Chem.csv (Comma Separated Values (.csv), 9.24 KB) MD5:5f4119c09be1df7f8811981453be3eec Primary data file for dataset ID 3492

[table of contents | back to top]

Parameters

Parameter	Description	Units
Cast	Cast	xxxx.x
date	date	yyyymmdd

time	time	hhmm
lat	Station latitude (South is negative)	decimal degrees
lon	Station longitude (West is negative)	decimal degrees
Bottle	Bottle	integer
Pressure	Pressure	decibars
T_in_situ	T in situ	deg c
Sal	Sal	PSU
Sigma_Tau	Sigma Tau	(tbd)
O2	O2	uM
pH	pH	sea water scale
Alkalinity	Alkalinity	(tbd)
PO4	PO4	uM
Total_P	Total P	uM
Si	Si	uM
NO3_UW	NO3 UW	uM
NO2	NO2	uM
NH4	NH4	uM
UREA	UREA	uM
H2S	H2S	uM

Mn_dissolved	Mn dissolved	uM
Organic_P	Organic P	uM
Mn_total	Mn total	uM
Mn_particulate	Mn particulate	uM
Suspended_PON	Suspended PON	uM
Suspended_POC	Suspended POC	uM
UW_DON	UW DON	(tbd)
N2_Ar	N2 Ar	(tbd)

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	CTD profiler
Generic Instrument Name	CTD - profiler
Generic Instrument Description	The Conductivity, Temperature, Depth (CTD) unit is an integrated instrument package designed to measure the conductivity, temperature, and pressure (depth) of the water column. The instrument is lowered via cable through the water column. It permits scientists to observe the physical properties in real-time via a conducting cable, which is typically connected to a CTD to a deck unit and computer on a ship. The CTD is often configured with additional optional sensors including fluorometers, transmissometers and/or radiometers. It is often combined with a Rosette of water sampling bottles (e.g. Niskin, GO-FLO) for collecting discrete water samples during the cast. This term applies to profiling CTDs. For fixed CTDs, see https://www.bco-dmo.org/instrument/869934.

[table of contents | back to top]

Deployments

AV2007_May

Website	https://www.bco-dmo.org/deployment/58673
Platform	R/V Akvanavt
Start Date	2007-05-18
End Date	2007-05-21
Description	RV Akvanavt, Russia R/V "Akvanavt" is operated by Southern Branch of the P.P.Shirshov Institute of Oceanology of the Russian Academy of Sciences (SB SIO RAS) in Gelendzhik, Russia. Commissioning - 18.08.1976 Displacement, tons - 273 Dimensions, meters - 34.0 x 7.1 x 2.6 Speed max, knots - 8.5 It holds 13 crewmembers and 8 scientists. The vessel is fitted up with modern navigational systems, research instruments and equipment for complex studies of the Sea. The P.P.Shirshov Institute of Oceanology of the Russian Academy of Sciences (IO RAS)

[table of contents | back to top]

Project Information

Anammox, denitrification and nitrogen fixation in the Black Sea (Anammox Black Sea)

Coverage: Black Sea

Anammox, denitrification and nitrogen fixation in the Black Sea

The goal of this research project is to understand the large variability in the chemical and microbial distributions related to nitrogen cycling in the suboxic zone of the Black Sea. The large temporal variability is best explained by changes by microbially mediated processes such as ANAMMOX and nitrification. Previous work has identified some of the bacteria present across the chemocline, but their metabolisms, activities, and relative contributions to the biogeochemical balance of nitrogen are still very poorly understood. This project will address not only the presence and absence of different types and abundances of microbial groups, but also their metabolic activity by testing two hypotheses. The first hypothesis is that the seasonal variability in the flux of particulate organic carbon causes variability in the relative importance of ANAMMOX and denitrification. The second hypothesis is that variability in the concentrations of N2 and Delta 15 N-N2 is determined by variability in the vertical flux of particulate organic nitrogen produced by nitrogen fixation in the euphotic zone. The principal investigators will address these hypotheses by conducting a time series of observations that consist of four short cruises (spring, fall, winter and summer) on a Russian research vessel to deep water stations in the Black Sea. During these cruises comprehensive hydrophysical, chemical and microbiological sampling, and measurements of the sinking flux of particulate organic carbon will be conducted. This new geochemical data will be used to expand on the investigators previous data sets by looking specifically at the variability in nitrogen species and isotope distributions and fluxes over the annual cycle. The specific focus of the biological work proposed here is to document not only changes in the microbial community, but to identify active growth and gene transcripts of specific groups of microbes. The study has ramifications beyond the Black Sea as the results will help us understand some of the controls on nitrogen cycling under low oxygen conditions in general. The ability to predict future change as a result of anthropogenic forcing requires that we understand the current dynamics in the nitrogen cycle. Suboxic and anaerobic environments are susceptible to anthropogenic forcing, and play an increasingly important role not only in enclosed basins but in areas of high productivity and economic importance, such as the Oregon and Washington coast. These results will also shed light on suboxic and anaerobic processes that have been important throughout Earth's history.

RELATED PUBLICATIONS:

Fuchsman, CA; Murray, JW; Konovalov, SK. "Concentration and natural stable isotope profiles of nitrogen species in the Black Sea," MARINE CHEMISTRY, v.111, 2008, p. 90-105. [View at Web of Science]

Konovalov, SK; Fuchsman, CA; Belokopitov, V; Murray, JW. "Modeling the distribution of nitrogen species and isotopes in the water column of the Black Sea," MARINE CHEMISTRY, v.111, 2008, p. 106-124. [View at Web of Science]

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0751617

[table of contents | back to top]