

# Hydrographic data collected by CTD during RVIB Nathaniel B. Palmer cruise in the Ross Sea, Southern Ocean from 2017-2018

**Website:** <https://www.bco-dmo.org/dataset/783911>

**Data Type:** Cruise Results

**Version:** 1

**Version Date:** 2020-01-03

## Project

» [Collaborative Research: Cobalamin and Iron Co-Limitation Of Phytoplankton Species in Terra Nova Bay](#) (CICLOPS)

Contributors	Affiliation	Role
<a href="#">DiTullio, Giacomo</a>	College of Charleston (CofC)	Principal Investigator
<a href="#">Lee, Peter</a>	College of Charleston (CofC)	Co-Principal Investigator
<a href="#">York, Amber</a>	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

## Abstract

Hydrographic data collected by CTD during RVIB Nathaniel B. Palmer cruise in the Ross Sea, Southern Ocean from 2017-2018

---

## Table of Contents

- [Coverage](#)
  - [Dataset Description](#)
    - [Acquisition Description](#)
    - [Processing Description](#)
  - [Parameters](#)
  - [Instruments](#)
  - [Deployments](#)
  - [Project Information](#)
  - [Funding](#)
-

## Coverage

**Spatial Extent:** N:-64.7219 E:-173.5369 S:-78.6295 W:179.9983

**Temporal Extent:** 2017-12-26 - 2018-02-19

---

## Dataset Description

Hydrographic data collected by CTD during RVIB Nathaniel B. Palmer cruise in the Ross Sea, Southern Ocean from 2017-2018.

## Acquisition Description

Hydrography data were collected using a Sea-Brid SBE 9 CTD with an SBE 11plus deck unit. The CTD was equipped with sensors to measure temperature, conductivity, pressure, dissolved oxygen, fluorescence, altimetry, beam transmission and irradiance.

Locations: Amundsen Sea, Ross Sea, Terra Nova Bay

## Processing Description

Data collected from the CTD were processed using Seasave version 7.26.1.8. The data included are from the downcasts.

BCO-DMO Data Manager Processing Notes:

- \* added a conventional header with dataset name, PI name, version date
- \* modified parameter names to conform with BCO-DMO naming conventions (spaces, +, and - changed to underscores). Units in parentheses removed and added to Parameter Description metadata section.
- \* Concatenated 79 .csv files into one tabular dataset.
- \* Added column "Station" with the station number from the originally submitted csv filename.
- \* Changed date format from m/d/Y to ISO 8601 formatted date Y-m-d
- \* Extracted time from "Julian Day" and "Date" to construct ISO\_DateTime\_UTC.
- \* Data sorted by ISO\_DateTime\_UTC, Station, Pressure, Depth

[ [table of contents](#) | [back to top](#) ]

---

## Parameters

Parameter	Description	Units
Station	Station	unitless
Date	Date in format yyyy-mm-dd	unitless
Julian_Day	Decimal day of year. Days since Jan 1st of the calendar year with time included as fractional days.	days
ISO_DateTime_UTC	Timestamp (UTC) in standard ISO 8601:2004(E) format YYYY-mm-ddTHH:MM:SSZ	unitless
Pressure	Pressure	decibars (db)
Depth	Depth	meters (m)
Temperature	Temperature (sensor 1)	degrees Celsius (C)
Temperature_2	Temperature (sensor 2)	degrees Celsius
Conductivity	Conductivity (sensor 1)	milliSiemens per centimeter (mS/cm)
Conductivity_2	Conductivity (sensor 2)	milliSiemens per centimeter (mS/cm)
Oxygen	Oxygen (sensor 1)	millileters per liter (mL/L)
Oxygen_2	Oxygen (sensor 2)	millileters per liter (mL/L)
Fluorescence	Fluorescence	micrograms per cubic meter (mg/m <sup>3</sup> )
Beam_Transmission	Beam Transmission	percent (%)
PAR_Irradiance	PAR/Irradiance	micromoles photons per meters squared per second (umol photons/m <sup>2</sup> /s)
Latitude	Latitude, degrees North	decimal degrees
Longitude	Longitude, degrees East	decimal degrees
Altimeter	Altitude	meters (m)
SPAR_Surface_Irradiance	SPAR/Surface Irradiance	micromoles photons per meters squared per second (umol photons/m <sup>2</sup> /s)
Time_Elapsed	Time Elapsed	seconds

Scan_Count	Scan Count	unitless
Salinity	Salinity (sensor 1)	PSU
Salinity_2	Salinity (sensor 2)	PSU
Oxygen_Saturation	Oxygen Saturation	millileters per liter (mL/L)
Scans_bin	Number of scans per meter bin	count
Flag	Flag. Quality assurance tag. 0 indicates good quality data with no issues.	unitless

[ [table of contents](#) | [back to top](#) ]

---

## Instruments

<b>Dataset-specific Instrument Name</b>	
<b>Generic Instrument Name</b>	CTD Sea-Bird SBE 911plus
<b>Generic Instrument Description</b>	<p>The Sea-Bird SBE 911plus is a type of CTD instrument package for continuous measurement of conductivity, temperature and pressure. The SBE 911plus includes the SBE 9plus Underwater Unit and the SBE 11plus Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9plus and SBE 11plus is called a SBE 911plus. The SBE 9plus uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3plus and SBE 4). The SBE 9plus CTD can be configured with up to eight auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). more information from Sea-Bird Electronics</p>

[ [table of contents](#) | [back to top](#) ]

---

## Deployments

## NBP1801

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/778919">https://www.bco-dmo.org/deployment/778919</a>
<b>Platform</b>	RVIB Nathaniel B. Palmer
<b>Start Date</b>	2017-12-16
<b>End Date</b>	2018-03-03
<b>Description</b>	Chief Scientist: Saba, Grace Start Port: Punta Arenas End Port: Hobart

[ [table of contents](#) | [back to top](#) ]

---

## Project Information

### Collaborative Research: Cobalamin and Iron Co-Limitation Of Phytoplankton Species in Terra Nova Bay (CICLOPS)

**Coverage:** Amundsen Sea, Ross Sea, Terra Nova Bay

NSF abstract: Phytoplankton blooms in the coastal waters of the Ross Sea, Antarctica are typically dominated by either diatoms or *Phaeocystis Antarctica* (a flagellated algae that often can form large colonies in a gelatinous matrix). The project seeks to determine if an association of bacterial populations with *Phaeocystis antarctica* colonies can directly supply *Phaeocystis* with Vitamin B12, which can be an important co-limiting micronutrient in the Ross Sea. The supply of an essential vitamin coupled with the ability to grow at lower iron concentrations may put *Phaeocystis* at a competitive advantage over diatoms. Because *Phaeocystis* cells can fix more carbon than diatoms and *Phaeocystis* are not grazed as efficiently as diatoms, the project will help in refining understanding of carbon dynamics in the region as well as the basis of the food web webs. Such understanding also has the potential to help refine predictive ecological models for the region. The project will conduct public outreach activities and will contribute to undergraduate and graduate research. Engagement of underrepresented students will occur during summer student internships. A collaboration with Italian Antarctic researchers, who have been studying the Terra Nova Bay ecosystem since the 1980s, aims to enhance the project and promote international scientific collaborations. The study will test whether a mutualistic symbioses between attached bacteria and *Phaeocystis* provides colonial cells a mechanism for alleviating chronic Vitamin B12 co-limitation effects thereby conferring them with a competitive advantage over diatom communities. The use of drifters in a time series study will provide the opportunity to track in both space and time a developing algal bloom in Terra Nova Bay and to determine community structure and the physiological nutrient status of microbial

populations. A combination of flow cytometry, proteomics, metatranscriptomics, radioisotopic and stable isotopic labeling experiments will determine carbon and nutrient uptake rates and the role of bacteria in mitigating potential vitamin B12 and iron limitation. Membrane inlet and proton transfer reaction mass spectrometry will also be used to estimate net community production and release of volatile organic carbon compounds that are climatically active. Understanding how environmental parameters can influence microbial community dynamics in Antarctic coastal waters will advance an understanding of how changes in ocean stratification and chemistry could impact the biogeochemistry and food web dynamics of Southern Ocean ecosystems.

[ [table of contents](#) | [back to top](#) ]

---

## Funding

Funding Source	Award
<a href="#">NSF Office of Polar Programs (formerly NSF PLR) (NSF OPP)</a>	<a href="#">OPP-1644073</a>

[ [table of contents](#) | [back to top](#) ]