CTD data from McMurdo Sound, Antarctica from 2012 to 2015 (McMurdo Predator Prey project)

Website: https://www.bco-dmo.org/dataset/680929
Data Type: Other Field Results
Version:
Version Date: 2017-05-04

Project
» Food web dynamics in an intact ecosystem: the role of top predators in McMurdo Sound (McMurdo Predator Prey)

Contributors	Affiliation	Role
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Coverage

Spatial Extent: **N**:-77.55077 **E**:166.3047 **S**:-77.70342 **W**:165.06118
Temporal Extent: 2012-11-21 - 2015-01-06

Dataset Description

This dataset includes temperature, salinity, conductivity, oxygen, depth, sound velocity, chlorophyll fluorescence, and pH measurements from McMurdo Sound, Antarctica. Data were collected by CTD, fluorescence, and pH sensors during austral years 2012/2013 and 2014/2015

Methods & Sampling

A small hole was drilled in the McMurdo Sound fast ice. The CTD was deployed below the fast ice to ~ 2 m depth. The CTD was then powered on and allowed to sit a few minutes until the pumps turned on and sensors stabilized and equilibrated. The CTD was then lowered using a hand winch to depths between 97 and 175 m.

Data Processing Description

These data are not quality controlled. The oxygen sensor failed at some point during both 2012 and 2014. The conductivity sensor calibrations did not show significant drift, however, a bad cable in 2014 likely caused intermittent data spikes.

There are no fluorescence values in these data for 2012 and the beginning of 2014. The first station with fluorescence is station 108 in 2014. There are no pH values in the 2014 data.

Raw data were saved as hex files and converted to 1 m bin averaged data using the Sea-Bird Electronics Inc. Data Processing Software v.7.23.1. For calibration and instrument information please consult the CTD header files (ZIP, 131 files, 440 KB total). The header files contain header lines generated by Sea-Bird processing software for each cast.

The "Parameter" section of this dataset landing page provides the data parameter names currently used in this data version as well as the original name used in the Sea-Bird Data Processing Software.

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
* blank values replaced with no data value 'nd'
* data from Jan 02 2013 15:00 had some trailing commas and/or extra values at end of lines (0.0). Characters after the last comma were removed.
* v0 Voltage 0 was duplicated with same variable name, values, and description. Removed second instance
* For station 212, austral season 2014 the time was in elapsed seconds so added the time in hh:mm instead to match other files. Got the time from a date time string column (timeJ) in the original file.
* Date format converted to ISO Date format (source timeJ)
* Data version 2017-05-04 is an update of version 2017-02-08 that includes variable name changes in the data and a timestamp change from local to UTC. Time and date now called time_local, date_local. Other variables are now more descriptive for example "depSM" is now "depth." Added time zone offset parameter.

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Data Files

File
ctds.csv(Comma Separated Values (.csv), 6.08 MB) MD5:6d4ed640afc81e793b723b86f0021216
Primary data file for dataset ID 680929

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Parameters

Parameter	Description	Units
austral_year	Austral season sampled	unitless
station	Sampling station identifier	unitless
cast	CTD cast identifier	unitless
lat	Latitude of sample; north is positive	decimal degrees
lon	Longitude of sample; west is negative	decimal degrees
depth	Depth of sample. Originally named "depSM."	meters
ISO_DateTime_UTC	ISO timestamp based on the ISO 8601:2004(E) standard in format YYYY-mm-ddTHH:MM:SS[.xx]Z (UTC)	unitless
date_local	Local date in format yyyy-mm-dd	unitless

time_local	Local time in format hh:mm:ss	unitless
time_zone_offset	Time offset in hours from UTC to local time at McMurdo Station.	unitless
temp	Temperature (ITS-90). Originally named "tv290C."	degrees Celsius
potemp	Primary potential temperature (ITS-90). Originally named "potemp090C."	degrees Celsius
sal	Salinity. Originally named "sal00."	practical salinity unit (PSU)
cond_S_m	Conductivity. Originally named "c0S/m."	Siemens per meter (S/m)
cond_mS_cm	Conductivity. Originally named "c0mS/cm."	millisiemens per centimeter (mS/cm)
density	Density. Originally named "density00."	kilograms per meter cubed (kg/m^3)
sigma_theta	Sigma-theta density. Originally named "sigma_e00."	kilograms per meters cubed
sigma_t	Sigma-t density. Originally named "sigma_t00."	kilograms per meters cubed
press	Pressure (Strain Gauge). Originally named "prdM."	decibars (db)
O2_mL_L	Dissolved oxygen. Originally named "sbeox0ML/L."	milliliters per liter (ml/l)
O2_mg_L	Dissolved oxygen. Originally named "sbeox0Mg/L."	milligrams per liter (mg/l)
O2_umol_kg	Dissolved oxygen. Originally named "sbeox0Mm/Kg."	micromoles per kilogram (umol/kg)
O2_sat	Oxygen saturation. Originally named "sbeox0PS."	percent
fluor	Fluorescence (from WET Labs ECO-AFL/FL). Originally named "flECO-AFL."	milligrams per meter cubed (mg/m^3)
pH	pH. Originally named "ph."	pH units
flag	Quality flag	unitless
sound_vel_CM	Sound velocity. Calculated using Chen and Millero (1977) formula. Originally named "svCM."	meters per second
sound_vel_DM	Sound velocity. Calculated using Del Grosso (1974) formula. Originally named "svDM."	meters per second
sound_vel_WM	Sound velocity. Calculated using Wilson (1960) formula. Originally named "svWM."	meters per second
avg_sound_vel_CM	Average sound velocity. Calculated using Chen and Millero (1977) formula. Originally named "avgsvCM."	meters per second
avg_sound_vel_DM	Average sound velocity. Calculated using Del Grosso (1974) formula. Originally named "avgsvDM."	meters per second
avg_sound_vel_WM	Average sound velocity. Calculated using Wilson (1960) formula. Originally named "avgsvWM."	meters per second

Instruments

Dataset-specific Instrument Name	Seabird SBE 19 Plus
Generic Instrument Name	CTD Sea-Bird SBE SEACAT 19plus
Generic Instrument Description	Self contained self powered CTD profiler. Measures conductivity, temperature and pressure in both profiling (samples at 4 scans/sec) and moored (sample rates of once every 5 seconds to once every 9 hours) mode. Available in plastic or titanium housing with depth ranges of 600m and 7000m respectively. Minature submersible pump provides water to conductivity cell.

Dataset-specific Instrument Name	
Generic Instrument Name	Niskin bottle
Generic Instrument Description	A Niskin bottle (a next generation water sampler based on the Nansen bottle) is a cylindrical, non-metallic water collection device with stoppers at both ends. The bottles can be attached individually on a hydrowire or deployed in 12, 24, or 36 bottle Rosette systems mounted on a frame and combined with a CTD. Niskin bottles are used to collect discrete water samples for a range of measurements including pigments, nutrients, plankton, etc.

Dataset-specific Instrument Name	Sea-Bird SBE-27 pH sensor
Generic Instrument Name	pH Sensor
Generic Instrument Description	An instrument that measures the hydrogen ion activity in solutions. The overall concentration of hydrogen ions is inversely related to its pH. The pH scale ranges from 0 to 14 and indicates whether acidic (more H+) or basic (less H+).

Dataset-specific Instrument Name	
Generic Instrument Name	Sea-Bird SBE 43 Dissolved Oxygen Sensor
Generic Instrument Description	The Sea-Bird SBE 43 dissolved oxygen sensor is a redesign of the Clark polarographic membrane type of dissolved oxygen sensors. more information from Sea-Bird Electronics

Dataset-specific Instrument Name	
Generic Instrument Name	Wet Labs ECO-AFL/FL Fluorometer
Generic Instrument Description	The Environmental Characterization Optics (ECO) series of single channel fluorometers delivers both high resolution and wide ranges across the entire line of parameters using 14 bit digital processing. The ECO series excels in biological monitoring and dye trace studies. The potted optics block results in long term stability of the instrument and the optional anti-biofouling technology delivers truly long term field measurements. more information from Wet Labs

Deployments

McMurdo_CTDs_2012-2014

Website	https://www.bco-dmo.org/deployment/679688
Platform	McMurdo Station
Start Date	2012-11-12
End Date	2015-01-09
Description	**Methods & Sampling** CTD casts in McMurdo Sound. For calibration information and specific instrument models used please consult the CTD header files (ZIP, 131 files, 440 KB total)

Project Information

Food web dynamics in an intact ecosystem: the role of top predators in McMurdo Sound (McMurdo Predator Prey)

**Website**: https://scini-penguin.mlml.calstate.edu/pauls-wordpress-test-site/

Coverage: McMurdo Sound, Antarctica

Extracted from the NSF award abstract:

The research project investigates the importance of top down forcing on pelagic food webs. The relatively pristine Ross Sea includes large populations of upper-level predators such as minke and killer whales, Adélie and Emperor penguins, and Antarctic toothfish. This project focuses on food web interactions of Adélie penguins, minke whales, and the fish-eating Ross Sea killer whales, all of which exert foraging pressure on their main prey, crystal krill (*Euphausia cyrstallorophias*) and silver fish (*Pleuragramma antarcticum*) in McMurdo Sound.

The investigators used a video- and acoustic-capable ROV, and standard biological and environmental sensors to quantify the abundance and distribution of phytoplankton, sea ice biota, prey, and relevant habitat data. The sampling area included 37 stations across an 30 x 15 km section of McMurdo Sound, stratified by distance from the ice edge as a proxy for air-breathing predator access. This study will be among the first to assess top-down forcing in the Ross Sea ecosystem and will form the basis for multidisciplinary studies in the future.

Map sampling stations
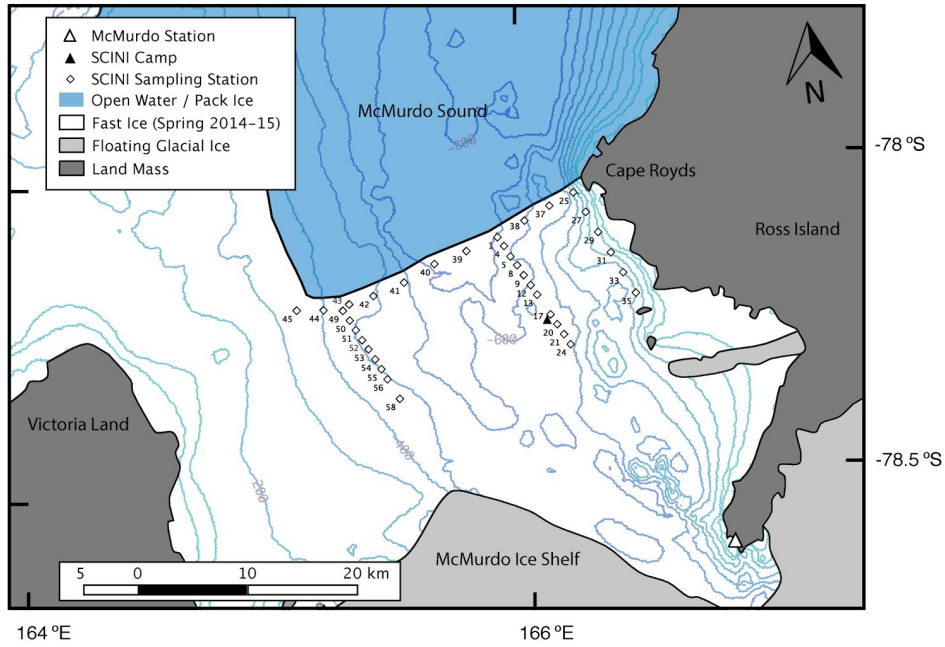
Funding

Funding Source	Award
NSF Division of Polar Programs (NSF PLR)	PLR-0944511