CTD data collected during MOCNESS hauls from ARSV Laurence M. Gould, RVIB Nathaniel B. Palmer LMG0104, LMG0106, LMG0203, NBP0103, NBP0104, NBP0202, NBP0204 in the Southern Ocean from 2001-2002 (SOGLOBEC project)

Website: https://www.bco-dmo.org/dataset/2515
Version: final
Version Date: 2001-12-03

Project
» U.S. GLOBEC Southern Ocean (SOGLOBEC)

Program
» U.S. GLOBal ocean ECosystems dynamics (U.S. GLOBEC)

Contributors	Affiliation	Role
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Table of Contents

Dataset Description

CTD observations taken simultaneously during MOCNESS tows, plus MOCNESS sampling conditions

Note: Some variables have been eliminated from the display but are nevertheless available. These variables include: oxycurrent, oxytemp, tempco, and echo.

The MOCNESS is based on the Tucker Trawl principle (Tucker, 1951). The particular MOCNESS system from which these CTD data came is one of two net systems. The MOCNESS-1 has nine rectangular nets (1m x 1.4 m) which are opened and closed sequentially by commands through conducting cable from the surface (Wiebe *et al.*, 1976). In both systems, "the underwater unit sends a data frame, comprised of temperature, depth, conductivity, net-frame angle, flow count, time, number of open net, and net opening/closing, to the deck unit in a compressed hexadecimal format every 2 seconds and from the deck unit to a microcomputer every 4 seconds... Temperature (to approximately 0.01 deg C) and conductivity are measured with SEABIRD sensors. Normally, a modified T.S.K.-flowmeter is used... Both the temperature and conductivity sensors and the flow meter are mounted on top of the frame so that they face horizontally when the frame is at a towing angle of 45deg... Calculations of salinity (to approximately 0.01 o/oo S), potential temperature (theta), potential density (sigma), the oblique and vertical velocities of the net, and the approximate volume filtered by each net are made after each string of data has been received by the computer." (Wiebe *et al.*, 1985)
In addition, data were collected from four other sensors attached to the frame: the Transmissometer, the

Fluorometer, the Down welling light sensor, and the Oxygen sensor. A SeaBird underwater pump was also included in the sensor suite.

It should be noted that due to Antarctic cold, the first few minutes of data are often of questionable value as they are extremely variable and have a high frequency of "50.000" (indicating "bad values") in the temp, theta and sal fields. Once the sensors encounter deeper, warmer water, they start recording good values.

For additional information, contact the chief scientist for the cruise.

References

Fofonoff and Millard, 1983, UNESCO technical papers in Marine Sciences, #44

Tucker, G.H., 1951. Relation of fishes and other organisms to the scattering of underwater sound. *Journal of Marine Research*, **10:** 215-238.

Wiebe, P.H., K.H. Burt, S. H. Boyd, A.W. Morton, 1976. The multiple opening/closing net and environmental sensing system for sampling zooplankton. *Journal of Marine Research*, **34(3):** 313-326

Wiebe, P.H., A.W. Morton, A.M. Bradley, R.H. Backus, J.E. Craddock, V. Barber, T.J. Cowles and G.R. Flierl, 1985. New developments in the MOCNESS, an apparatus for sampling zooplankton and micronekton. *Marine Biology*, **87:** 313-323.

last updated January 10, 2006; gfh

Methods & Sampling

The MOCNESS is based on the Tucker Trawl principle (Tucker, 1951). The particular MOCNESS system from which these CTD data came is one of two net systems. The MOCNESS-1 has nine rectangular nets (1m x 1.4 m) which are opened and closed sequentially by commands through conducting cable from the surface (Wiebe et al., 1976). The MOCNESS-10 (with 10 m2 nets)carries 6 nets of 3.0-mm circular mesh. In both systems, 'the underwater unit sends a data frame, comprised of temperature, depth, conductivity, net-frame angle, flow count, time, number of open net, and net opening/closing, to the deck unit in a compressed hexadecimal format every 2 seconds and from the deck unit to a microcomputer every 4 seconds... Temperature (to approximately 0.01 deg C) and conductivity are measured with SEABIRD sensors. Normally, a modified T.S.K.-flowmeter is used... Both the temperature and conductivity sensors and the flow meter are mounted on top of the frame so that they face horizontally when the frame is at a towing angle of 45deg... Calculations of salinity (to approximately 0.01 o/oo S), potential temperature (theta), potential density (sigma), the oblique and vertical velocities of the net, and the approximate volume filtered by each net are made after each string of data has been received by the computer.' (Wiebe et al., 1985) In addition, data were collected from four other sensors attached to the frame: the Transmissometer, the Fluorometer, the Down welling light sensor, and the Oxygen sensor. A SeaBird underwater pump was also included in the sensor suite.

Data Processing Description

It should be noted that due to Antarctic cold, the first few minutes of data are often of questionable value as they are extremely variable and have a high frequency of '50.000' (indicating 'bad values') in the temp, theta and sal fields. Once the sensors encounter deeper, warmer water, they start recording good values.

For additional information, contact the chief scientist for the cruise.

[table of contents | back to top]

Data Files

File
mocness_ctd.csv (Comma Separated Values (.csv), 35.95 MB) MD5:dff00f9e9c27ef6719520efb67eb25fe Primary data file for dataset ID 2515

[table of contents | back to top]

Parameters

Parameter	Description	Units
cruiseid	cruise identification, e.g. NBP0202, for RVIB Palmer cruise 0202	
temp	temperature of water	degrees C
datatype	sampling method - instrument type, e.g. MOCNESS-1 or MOCNESS-10	
year	year	
brief_desc	brief cruise description, such as process or mooring	
tow	tow number	
day_gmt	day of month, GMT, 1-31	
month_gmt	month of year, GMT, 1 - 12	
station	station number, from event log	
station_std	standard station number, from event log	
yrday_gmt	year day as a decimal, based on Julian calendar, GMT	YYY.Y
time_gmt	time, GMT using 24 hour clock to decimal minutes	HHmm.m
press	depth of observation or sample	meters
potemp	potential temperature or theta1 [1]Fofonoff and Millard, 1983, UNESCO technical papers in Marine Sciences, #44	
sal	salinity calculated from conductivity, bad values are set to 50	
sigma_0	potential density1 [1]Fofonoff and Millard, 1983, UNESCO technical papers in Marine Sciences, #44	
flvolt	relative fluorescence (0-5 volts)	volts
angle	angle of net frame relative to vertical (0-89 degrees)	degrees
flow	consecutive flow counts	
hzvel	horizontal net velocity	m/min
vtvel	vertical net velocity	m/min
vol_filt	volume filtered	meters3
trans_v	transmissometry or light transmission, (0-5 volts)	volts
o2	dissolved oxygen	ml/liter
lite	downwelling light	volts
net	MOCNESS net number, (00-08)	
lat	latitude, negative = South	DD.D
lon	longitude, negative = West	DDD.D

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	Conductivity, Temperature, Depth
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.

Dataset-specific Instrument Name	CTD MOCNESS
Generic Instrument Name	CTD MOCNESS
Generic Instrument Description	The CTD part of the MOCNESS includes 1) a pressure (depth) sensor which is a thermally isolated titanium strain gauge with a standard range of 0-5000 decibars full scale, 2) A Sea Bird temperature sensor whose frequency output is measured and sent to the surface for logging and conversion to temperature by the software in the MOCNESS computer (The system allows better than 1 milli-degree resolution at 10 Hz sampling rate), and 3) A Sea Bird conductivity sensor whose output frequency is measured and sent to the surface for logging and conversion to conductivity by the software in the computer (The system allows better than 1 micro mho/cm at 10 Hz sampling rate). The data rate depends on the speed of the computer and the quality of the cable. With a good cable, the system can operate at 2400 baud, sampling all variables at 2 times per second. One sample every 4 seconds is the default, although the hardware can operate much faster. (From The MOCNESS Manual)

[table of contents | back to top]

Deployments

LMG0104

Website	https://www.bco-dmo.org/deployment/57637
Platform	ARSV Laurence M. Gould
Report	http://www.ccpo.odu.edu/Research/globec/cruises/gould0103_0104.doc
Start Date	2001-04-20
End Date	2001-06-05
Description	**Methods & Sampling** The MOCNESS is based on the Tucker Trawl principle (Tucker, 1951). The particular MOCNESS system from which these CTD data came is one of two net systems. The MOCNESS-1 has nine rectangular nets (1m x 1.4 m) which are opened and closed sequentially by commands through conducting cable from the surface (Wiebe et al., 1976). The MOCNESS-10 (with 10 m2 nets)carries 6 nets of 3.0-mm circular mesh. In both systems, 'the underwater unit sends a data frame, comprised of temperature, depth, conductivity, net-frame angle, flow count, time, number of open net, and net opening/closing, to the deck unit in a compressed hexadecimal format every 2 seconds and from the deck unit to a microcomputer every 4 seconds... Temperature (to approximately 0.01 deg C) and conductivity are measured with SEABIRD sensors. Normally, a modified T.S.K.-flowmeter is used... Both the temperature and conductivity sensors and the flow meter are mounted on top of the frame so that they face horizontally when the frame is at a towing angle of 45deg... Calculations of salinity (to approximately 0.01 o/oo S), potential temperature (theta), potential density (sigma), the oblique and vertical velocities of the net, and the approximate volume filtered by each net are made after each string of data has been received by the computer.' (Wiebe et al., 1985) In addition, data were collected from four other sensors attached to the frame: the Transmissometer, the Fluorometer, the Down welling light sensor, and the Oxygen sensor. A SeaBird underwater pump was also included in the sensor suite. **Processing Description** It should be noted that due to Antarctic cold, the first few minutes of data are often of questionable value as they are extremely variable and have a high frequency of '50.000' (indicating 'bad values') in the temp, theta and sal fields. Once the sensors encounter deeper, warmer water, they start recording good values. For additional information, contact the chief scientist for the cruise.

LMG0106

Website	https://www.bco-dmo.org/deployment/57639
Platform	ARSV Laurence M. Gould
Report	http://www.ccpo.odu.edu/Research/globec/cruises01/lmg0106_menu.html
Start Date	2001-07-21
End Date	2001-09-01
Description	**Methods & Sampling** The MOCNESS is based on the Tucker Trawl principle (Tucker, 1951). The particular MOCNESS system from which these CTD data came is one of two net systems. The MOCNESS-1 has nine rectangular nets (1m x 1.4 m) which are opened and closed sequentially by commands through conducting cable from the surface (Wiebe et al., 1976). The MOCNESS-10 (with 10 m2 nets)carries 6 nets of 3.0-mm circular mesh. In both systems, 'the underwater unit sends a data frame, comprised of temperature, depth, conductivity, net-frame angle, flow count, time, number of open net, and net opening/closing, to the deck unit in a compressed hexadecimal format every 2 seconds and from the deck unit to a microcomputer every 4 seconds... Temperature (to approximately 0.01 deg C) and conductivity are measured with SEABIRD sensors. Normally, a modified T.S.K.-flowmeter is used... Both the temperature and conductivity sensors and the flow meter are mounted on top of the frame so that they face horizontally when the frame is at a towing angle of 45deg... Calculations of salinity (to approximately 0.01 o/oo S), potential temperature (theta), potential density (sigma), the oblique and vertical velocities of the net, and the approximate volume filtered by each net are made after each string of data has been received by the computer.' (Wiebe et al., 1985) In addition, data were collected from four other sensors attached to the frame: the Transmissometer, the Fluorometer, the Down welling light sensor, and the Oxygen sensor. A SeaBird underwater pump was also included in the sensor suite. **Processing Description** It should be noted that due to Antarctic cold, the first few minutes of data are often of questionable value as they are extremely variable and have a high frequency of '50.000' (indicating 'bad values') in the temp, theta and sal fields. Once the sensors encounter deeper, warmer water, they start recording good values. For additional information, contact the chief scientist for the cruise.

LMG0203

Website	https://www.bco-dmo.org/deployment/57642
Platform	ARSV Laurence M. Gould
Report	http://www.ccpo.odu.edu/Research/globec/main_cruises02/lmg0203/menu.html
Start Date	2002-04-07
End Date	2002-05-20
Description	**Methods & Sampling** The MOCNESS is based on the Tucker Trawl principle (Tucker, 1951). The particular MOCNESS system from which these CTD data came is one of two net systems. The MOCNESS-1 has nine rectangular nets (1m x 1.4 m) which are opened and closed sequentially by commands through conducting cable from the surface (Wiebe et al., 1976). The MOCNESS-10 (with 10 m2 nets)carries 6 nets of 3.0-mm circular mesh. In both systems, 'the underwater unit sends a data frame, comprised of temperature, depth, conductivity, net-frame angle, flow count, time, number of open net, and net opening/closing, to the deck unit in a compressed hexadecimal format every 2 seconds and from the deck unit to a microcomputer every 4 seconds... Temperature (to approximately 0.01 deg C) and conductivity are measured with SEABIRD sensors. Normally, a modified T.S.K.-flowmeter is used... Both the temperature and conductivity sensors and the flow meter are mounted on top of the frame so that they face horizontally when the frame is at a towing angle of 45deg... Calculations of salinity (to approximately 0.01 o/oo S), potential temperature (theta), potential density (sigma), the oblique and vertical velocities of the net, and the approximate volume filtered by each net are made after each string of data has been received by the computer.' (Wiebe et al., 1985) In addition, data were collected from four other sensors attached to the frame: the Transmissometer, the Fluorometer, the Down welling light sensor, and the Oxygen sensor. A SeaBird underwater pump was also included in the sensor suite. **Processing Description** It should be noted that due to Antarctic cold, the first few minutes of data are often of questionable value as they are extremely variable and have a high frequency of '50.000' (indicating 'bad values') in the temp, theta and sal fields. Once the sensors encounter deeper, warmer water, they start recording good values. For additional information, contact the chief scientist for the cruise.

NBP0103

Website	https://www.bco-dmo.org/deployment/57636
Platform	RVIB Nathaniel B. Palmer
Report	http://globec.whoi.edu/so-dir/reports/nbp0103/nbp0103.html
Start Date	2001-04-24
End Date	2001-06-05
Description	**Methods & Sampling** The MOCNESS is based on the Tucker Trawl principle (Tucker, 1951). The particular MOCNESS system from which these CTD data came is one of two net systems. The MOCNESS-1 has nine rectangular nets (1m x 1.4 m) which are opened and closed sequentially by commands through conducting cable from the surface (Wiebe et al., 1976). The MOCNESS-10 (with 10 m2 nets)carries 6 nets of 3.0-mm circular mesh. In both systems, 'the underwater unit sends a data frame, comprised of temperature, depth, conductivity, net-frame angle, flow count, time, number of open net, and net opening/closing, to the deck unit in a compressed hexadecimal format every 2 seconds and from the deck unit to a microcomputer every 4 seconds... Temperature (to approximately 0.01 deg C) and conductivity are measured with SEABIRD sensors. Normally, a modified T.S.K.-flowmeter is used... Both the temperature and conductivity sensors and the flow meter are mounted on top of the frame so that they face horizontally when the frame is at a towing angle of 45deg... Calculations of salinity (to approximately 0.01 o/oo S), potential temperature (theta), potential density (sigma), the oblique and vertical velocities of the net, and the approximate volume filtered by each net are made after each string of data has been received by the computer.' (Wiebe et al., 1985) In addition, data were collected from four other sensors attached to the frame: the Transmissometer, the Fluorometer, the Down welling light sensor, and the Oxygen sensor. A SeaBird underwater pump was also included in the sensor suite. **Processing Description** It should be noted that due to Antarctic cold, the first few minutes of data are often of questionable value as they are extremely variable and have a high frequency of '50.000' (indicating 'bad values') in the temp, theta and sal fields. Once the sensors encounter deeper, warmer water, they start recording good values. For additional information, contact the chief scientist for the cruise.

NBP0104

Website	https://www.bco-dmo.org/deployment/57638
Platform	RVIB Nathaniel B. Palmer
Report	http://www.ccpo.odu.edu/Research/globec/cruises01/nbp0104_menu.html
Start Date	2001-07-22
End Date	2001-08-31
Description	**Methods & Sampling** The MOCNESS is based on the Tucker Trawl principle (Tucker, 1951). The particular MOCNESS system from which these CTD data came is one of two net systems. The MOCNESS-1 has nine rectangular nets (1m x 1.4 m) which are opened and closed sequentially by commands through conducting cable from the surface (Wiebe et al., 1976). The MOCNESS-10 (with 10 m2 nets)carries 6 nets of 3.0-mm circular mesh. In both systems, 'the underwater unit sends a data frame, comprised of temperature, depth, conductivity, net-frame angle, flow count, time, number of open net, and net opening/closing, to the deck unit in a compressed hexadecimal format every 2 seconds and from the deck unit to a microcomputer every 4 seconds... Temperature (to approximately 0.01 deg C) and conductivity are measured with SEABIRD sensors. Normally, a modified T.S.K.-flowmeter is used... Both the temperature and conductivity sensors and the flow meter are mounted on top of the frame so that they face horizontally when the frame is at a towing angle of 45deg... Calculations of salinity (to approximately 0.01 o/oo S), potential temperature (theta), potential density (sigma), the oblique and vertical velocities of the net, and the approximate volume filtered by each net are made after each string of data has been received by the computer.' (Wiebe et al., 1985) In addition, data were collected from four other sensors attached to the frame: the Transmissometer, the Fluorometer, the Down welling light sensor, and the Oxygen sensor. A SeaBird underwater pump was also included in the sensor suite. **Processing Description** It should be noted that due to Antarctic cold, the first few minutes of data are often of questionable value as they are extremely variable and have a high frequency of '50.000' (indicating 'bad values') in the temp, theta and sal fields. Once the sensors encounter deeper, warmer water, they start recording good values. For additional information, contact the chief scientist for the cruise.

NBP0202

Website	https://www.bco-dmo.org/deployment/57641
Platform	RVIB Nathaniel B. Palmer
Report	http://globec.whoi.edu/so-dir/reports/nbp0202/nbp0202b.html
Start Date	2002-04-09
End Date	2002-05-21
Description	**Methods & Sampling** The MOCNESS is based on the Tucker Trawl principle (Tucker, 1951). The particular MOCNESS system from which these CTD data came is one of two net systems. The MOCNESS-1 has nine rectangular nets (1m x 1.4 m) which are opened and closed sequentially by commands through conducting cable from the surface (Wiebe et al., 1976). The MOCNESS-10 (with 10 m2 nets)carries 6 nets of 3.0-mm circular mesh. In both systems, 'the underwater unit sends a data frame, comprised of temperature, depth, conductivity, net-frame angle, flow count, time, number of open net, and net opening/closing, to the deck unit in a compressed hexadecimal format every 2 seconds and from the deck unit to a microcomputer every 4 seconds... Temperature (to approximately 0.01 deg C) and conductivity are measured with SEABIRD sensors. Normally, a modified T.S.K.-flowmeter is used... Both the temperature and conductivity sensors and the flow meter are mounted on top of the frame so that they face horizontally when the frame is at a towing angle of 45deg... Calculations of salinity (to approximately 0.01 o/oo S), potential temperature (theta), potential density (sigma), the oblique and vertical velocities of the net, and the approximate volume filtered by each net are made after each string of data has been received by the computer.' (Wiebe et al., 1985) In addition, data were collected from four other sensors attached to the frame: the Transmissometer, the Fluorometer, the Down welling light sensor, and the Oxygen sensor. A SeaBird underwater pump was also included in the sensor suite. **Processing Description** It should be noted that due to Antarctic cold, the first few minutes of data are often of questionable value as they are extremely variable and have a high frequency of '50.000' (indicating 'bad values') in the temp, theta and sal fields. Once the sensors encounter deeper, warmer water, they start recording good values. For additional information, contact the chief scientist for the cruise.

NBP0204

Website	https://www.bco-dmo.org/deployment/57643
Platform	RVIB Nathaniel B. Palmer
Report	http://globec.whoi.edu/so-dir/reports/nbp0204/nbp0204b.html
Start Date	2002-07-31
End Date	2002-09-18
Description	Also see NBP0204 Cruise Data Report **Methods & Sampling** The MOCNESS is based on the Tucker Trawl principle (Tucker, 1951). The particular MOCNESS system from which these CTD data came is one of two net systems. The MOCNESS-1 has nine rectangular nets (1m x 1.4 m) which are opened and closed sequentially by commands through conducting cable from the surface (Wiebe et al., 1976). The MOCNESS-10 (with 10 m2 nets)carries 6 nets of 3.0-mm circular mesh. In both systems, 'the underwater unit sends a data frame, comprised of temperature, depth, conductivity, net-frame angle, flow count, time, number of open net, and net opening/closing, to the deck unit in a compressed hexadecimal format every 2 seconds and from the deck unit to a microcomputer every 4 seconds... Temperature (to approximately 0.01 deg C) and conductivity are measured with SEABIRD sensors. Normally, a modified T.S.K.-flowmeter is used... Both the temperature and conductivity sensors and the flow meter are mounted on top of the frame so that they face horizontally when the frame is at a towing angle of 45deg... Calculations of salinity (to approximately 0.01 o/oo S), potential temperature (theta), potential density (sigma), the oblique and vertical velocities of the net, and the approximate volume filtered by each net are made after each string of data has been received by the computer.' (Wiebe et al., 1985) In addition, data were collected from four other sensors attached to the frame: the Transmissometer, the Fluorometer, the Down welling light sensor, and the Oxygen sensor. A SeaBird underwater pump was also included in the sensor suite. **Processing Description** It should be noted that due to Antarctic cold, the first few minutes of data are often of questionable value as they are extremely variable and have a high frequency of '50.000' (indicating 'bad values') in the temp, theta and sal fields. Once the sensors encounter deeper, warmer water, they start recording good values. For additional information, contact the chief scientist for the cruise.

[table of contents | back to top]

Project Information

U.S. GLOBEC Southern Ocean (SOGLOBEC)

Website: http://www.ccpo.odu.edu/Research/globec_menu.html

Coverage: Southern Ocean

The fundamental objectives of United States Global Ocean Ecosystems Dynamics (U.S. GLOBEC) Program are dependent upon the cooperation of scientists from several disciplines. Physicists, biologists, and chemists must make use of data collected during U.S. GLOBEC field programs to further our understanding of the interplay of physics, biology, and chemistry. Our objectives require quantitative analysis of interdisciplinary data sets and, therefore, data must be exchanged between researchers. To extract the full scientific value, data must be made available to the scientific community on a timely basis.

[table of contents | back to top]

Program Information

U.S. GLOBal ocean ECosystems dynamics (U.S. GLOBEC)

Website: http://www.usglobec.org/

Coverage: Global

U.S. GLOBEC (GLOBal ocean ECosystems dynamics) is a research program organized by oceanographers and fisheries scientists to address the question of how global climate change may affect the abundance and production of animals in the sea.

The U.S. GLOBEC Program currently had major research efforts underway in the Georges Bank / Northwest Atlantic Region, and the Northeast Pacific (with components in the California Current and in the Coastal Gulf of Alaska). U.S. GLOBEC was a major contributor to International GLOBEC efforts in the Southern Ocean and Western Antarctic Peninsula (WAP).

[table of contents | back to top]

Funding

Funding Source	Award
NSF Antarctic Sciences (NSF ANT)	unknown SOGLOBEC NSF ANT

[table of contents | back to top]