Southern Ocean 2001 moorings: LOW PASS temp., salinity, density data from ARSV Laurence M. Gould LMG0103, LMG0201A in the Southern Ocean from 2001-2002 (SOGLOBEC project)

Website: https://www.bco-dmo.org/dataset/3257
Version: 10 Nov. 2009
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Project
» U.S. GLOBEC Southern Ocean (SOGLOBEC)

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

Contributors	Affiliation	Role
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Dataset Description

"As part of the SO GLOBEC field program, the Woods Hole Oceanographic Institution (WHOI) deployed an array of instrumented subsurface moorings near Marguerite Bay during March 2001- March 2002 and a second array during March 2002-March 2003 (Figure 1). The moored measurements included pressure, temperature, conductivity, velocity, acoustic backscatter, and ice thickness. To monitor surface forcing during the moored array observations, two automatic weather stations (AWSs) were deployed on islands in Marguerite Bay and time series of wind, air temperature, pressure, and relative humidity were collected from May 2001 through March 2003.

The primary goals of this effort were to measure the temporal and spatial variability of currents and physical and biological water properties in the study area on time scales from hours to seasonal, improve our description and understanding of the regional general circulation, and identify and describe those physical processes that make this region well suited for krill production and survival." *[from technical report WHOI-2005-07.pdf (10.2 MB)]*

Methods & Sampling

See WHOI-2005-07.pdf (10.2 MB)]

Rotation angle (rotangle): The basic coordinate system is x(east) and y (north); the x and y velocity components are u and v. for some analysis, the coordinate and velocity are rotated into a local isobath coordinate system, where xr and yr are the rotated coordinates and ur and vr are the rotated velocity components. rotangle is the angle that the rotated xr and ur point in, measured in degrees counterclockwise from east. In the A1 case, rotangle = -152 degrees. Thus, the xr axis has been rotated 152 degrees clockwise (due to the negative sign on rotangle) from x (east). The governing complex equation (as it is written in matlab) is:

ur + i*vr = exp(i*pi*rotangle/180)*(u + i*v) where i = sqrt(-1).

Data Processing Description

See WHOI-2005-07.pdf (10.2 MB)]

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Data Files

File
moor_so_lp_2001_ts.csv (Comma Separated Values (.csv), 41.36 MB) MD5:c0de358465634f63a634bfab93e51476 Primary data file for dataset ID 3257

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Parameters

Parameter	Description	Units
year_start	starting year of mooring deployment	
lat	latitude, negative = South	decimal degrees
lon	longitude, negative = West	decimal degrees
depth	depth of instrument, negative = height above sea surf.	meters
hour_gmt	time GMT in hours (0-23)	whole hours
minute_gmt	time GMT in minutes (0-59)	whole minutes
day_gmt	day of month GMT (1-31)	
month_gmt	month of year GMT (1-12)	
year	year	
cond	conductivity	milliSeimens/centimeter
sigma_0	potential density	(kg/m^3)
sal	salinity, PSS78	psu
temp	water temperature, IPTS68	decimal deg. C
mooring	mooring identification	
depth_w	water depth	meters
yrday_gmt	GMT day and decimal time, as 326.5 for the 326th day of the year, or November 22 at 1200 hours (noon).	
density	water density	kilograms/meter3
rotangle	The angle that the rotated coordinates, xr, and the rotated velocity components, ur, point - measured in degrees counterclockwise from east (see more in Acquisition section, above)	degrees
sec	seconds of time	whole seconds

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Instruments

Dataset-specific Instrument Name	Acoustic Doppler Current Profiler
Generic Instrument Name	Acoustic Doppler Current Profiler
Generic Instrument Description	The ADCP measures water currents with sound, using a principle of sound waves called the Doppler effect. A sound wave has a higher frequency, or pitch, when it moves to you than when it moves away. You hear the Doppler effect in action when a car speeds past with a characteristic building of sound that fades when the car passes. The ADCP works by transmitting "pings" of sound at a constant frequency into the water. (The pings are so highly pitched that humans and even dolphins can't hear them.) As the sound waves travel, they ricochet off particles suspended in the moving water, and reflect back to the instrument. Due to the Doppler effect, sound waves bounced back from a particle moving away from the profiler have a slightly lowered frequency when they return. Particles moving toward the instrument send back higher frequency waves. The difference in frequency between the waves the profiler sends out and the waves it receives is called the Doppler shift. The instrument uses this shift to calculate how fast the particle and the water around it are moving. Sound waves that hit particles far from the profiler take longer to come back than waves that strike close by. By measuring the time it takes for the waves to bounce back and the Doppler shift, the profiler can measure current speed at many different depths with each series of pings. (More from WHOI instruments listing).

Dataset-specific Instrument Name	MicroCat
Generic Instrument Name	CTD Sea-Bird MicroCAT 37
Generic Instrument Description	The Sea-Bird MicroCAT CTD unit is a high-accuracy conductivity and temperature recorder based on the Sea-Bird SBE 37 MicroCAT series of products. It can be configured with optional pressure sensor, internal batteries, memory, built-in Inductive Modem, integral Pump, and/or SBE-43 Integrated Dissolved Oxygen sensor. Constructed of titanium and other non-corroding materials for long life with minimal maintenance, the MicroCAT is designed for long duration on moorings. In a typical mooring, a modem module housed in the buoy communicates with underwater instruments and is interfaced to a computer or data logger via serial port. The computer or data logger is programmed to poll each instrument on the mooring for its data, and send the data to a telemetry transmitter (satellite link, cell phone, RF modem, etc.). The MicroCAT saves data in memory for upload after recovery, providing a data backup if real-time telemetry is interrupted.

Dataset-specific Instrument Name	Sea-Bird Seacat CTD
Generic Instrument Name	CTD Sea-Bird SEACAT
Generic Instrument Description	The CTD SEACAT recorder is an instrument package manufactured by Sea-Bird Electronics. The first Sea-Bird SEACAT Recorder was the original SBE 16 SEACAT developed in 1987. There are several model numbers including the SBE 16plus (SEACAT C-T Recorder (P optional))and the SBE 19 (SBE 19plus SEACAT Profiler measures conductivity, temperature, and pressure (depth)). More information from Sea-Bird Electronics.

Dataset-specific Instrument Name	ice profiler
Generic Instrument Name	Ice Profiling Sonar
Generic Instrument Description	The ASL Environmental Sciences (e.g. IPS4 or IPS5) ice profiler is an upward looking sonar device deployed on a mooring for measuring ice keel drafts. The distance between the instrument and the bottom of the ice is measured by sonar at an operating frequency of 420 kHz with a beam width of 1.8 degrees and sampling rate of up to 2Hz. Water depth is measured by a pressure sensor and ice draft is calculated by the difference.

Dataset-specific Instrument Name	SBE 26 SeaGauge
Generic Instrument Name	Sea-Bird SBE 26 Wave and Tide Recorder
Generic Instrument Description	The Sea-Bird Electronics SBE 26 SEAGAUGE is a wave level and tide recorder with a pressure sensor, accurate clock, precision thermometer and optional SBE 4M conductivity sensor. Pressure data are integrated to give sea level or are burst recorded at rates up to 4 Hz to characterize waves. The standard pressure sensor is a 20 meter (45 psia) Quartzonix, with a temperature-compensated quartz element. Optionally, the SBE 26 can be configured with a Paroscientific Digiquartz pressure sensor with a temperature-compensated quartz element in 13 ranges, from 1 to 6800 meters (15 to 10,000 psia). more information from Sea-Bird Electronics

Dataset-specific Instrument Name	Vector Averaging Current Meter
Generic Instrument Name	Vector Averaging Current Meter
Generic Instrument Description	Vector Averaging Current Meter

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Deployments

LMG0103

Website	https://www.bco-dmo.org/deployment/57635
Platform	ARSV Laurence M. Gould
Report	http://www.ccpo.odu.edu/Research/globec/cruises01/mooringcruise/lmg0103_menu.html
Start Date	2001-03-18
End Date	2001-04-13
Description	**Methods & Sampling** A- and B-line mooring deployment

LMG0201A

Website	https://www.bco-dmo.org/deployment/57640
Platform	ARSV Laurence M. Gould
Report	http://www.ccpo.odu.edu/Research/globec/main_cruises02/lmg0201a/LMG02-01A_Report.pdf
Start Date	2002-02-06
End Date	2002-03-03
Description	**Methods & Sampling** A- and B-line mooring recovery and C-line deployment

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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.

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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).

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Funding

Funding Source	Award
NSF Antarctic Sciences (NSF ANT)	ANT-9910092

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