Zooplankton data from the Optical Plankton Counter (OPC) on a MOCNESS from RVIB Nathaniel B. Palmer, ARSV Laurence M. Gould NBP0104, LMG0104, LMG0203, NBP0204 in the Southern Ocean from 2001-2002 (SOGLOBEC project)

Website: https://www.bco-dmo.org/dataset/3466
Version: 2011-04-12

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

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

Contributors	Affiliation	Role
Zhou, Meng	University of Massachusetts Boston (UMB-EEOS)	Principal Investigator
Zhu, Yiwu	University of Massachusetts Boston (UMB-EEOS)	Data Manager
Copley, Nancy	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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Dataset Description

This data set was collected from the Optical Plankton Counter (OPC, Focal Technologies) during Southern Ocean GLOBEC cruises LMG00104, NBP0104, LMG0203, and NBP0204. The OPC was mounted on the MOCNESS-1 frame.

Data Processing Description

The OPC data was processed into abundance spectra (N) vs. equivalent spherical diameter (ESD) of plankton in 50 size classes in the depth intervals of a correspondent MOCNESS-1 tow. The spectra calculation is based on the standard definitions in Zhou and Huntley (2007):

Definitions:

v = body volume of a zooplankter (1)
Water volume filtered (V) = OPC cross section × flow speed (2)
Abundancy sprectrum(N)= (# zooplankton in size interval delta_v)/ size interval delta_v * V (3)

Units:
ESD: mm
v: mm3
N: # mm-1 (?ESD) m-3 (water)
V: m3

Data file format:
Line 1 (header): latitude longitude date time (local, at the beginning of the deployment)
Line 2 (title): logESD dep-range1 dep-range2 ...
Line 3-52 (data): log10(ESD) log10(b) (dep 1) log10(b) (dep 2) ....

Notes:
1) Each data file represents one MOCNESS/OPC cast .The OPC failed in some MOCNESS tows.
2) The filename conventions are "CruiseName_spe_cntStationNumber.txt". The OPC cast number is same as the corresponding MOCNESS-1 cast number.
3) The depth intervals of abundance spectra are equal to the depth intervals of a corresponding MOCNESS tow.
4) The water filtered by the OPC was estimated using the flowmeter on the MOCNESS-1.
5) The size interval delta-v is evenly distributed on log(ESD) of valid OPC size range
6) The first column of the data file , represent the mid values of log10(ESD) of each size group.
7) The "-3.00" for log10(b) means 0 counts for the size group in the depth bin.
8) In some cases the OPC went through ups and downs in one depth bin, which are indicated in the depth range, for example, "25-22-75".

Reference:
Zhou, M. and M. E. Huntley, Population dynamics theory of plankton based on biomass spectra. Marine Ecology Progress Series, 157, 61-73, 1997.

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Data Files

File
opc_moc1.csv (Comma Separated Values (.csv), 1.45 MB) MD5:d36178b5621c302ffdfac3b8019ba2f5 Primary data file for dataset ID 3466

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Parameters

Parameter	Description	Units
log_abund_spec	Log10 of the abundance spectra: zooplankton abundance per mm of ESD, per cubic meter of water, in log10	log10(number per millimeter/cubic meter of water)
cruiseid	cruise identifier	text
day_local	day in local time	1 to 30
depth_close	depth at which net closed	meters
depth_open	depth at which net opened	meters
lat	latitude; North is positive	decimal degrees
logESD	log of the Estimated Spherical Diameter	millimeters
lon	longitude; East is positive	decimal degrees
month_local	month in local time	1 to 12
time_local	local time; 24 hour clock	HHmm
tow	tow identifier	integer
yrday_local	local day and decimal time; as 326.5 for the 326th day of the year or November 22 at 1200 hours (noon)	number
year	year of sampling, local time	

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Instruments

Dataset-specific Instrument Name	MOCNESS
Generic Instrument Name	MOCNESS
Generic Instrument Description	The Multiple Opening/Closing Net and Environmental Sensing System or MOCNESS is a family of net systems based on the Tucker Trawl principle. There are currently 8 different sizes of MOCNESS in existence which are designed for capture of different size ranges of zooplankton and micro-nekton Each system is designated according to the size of the net mouth opening and in two cases, the number of nets it carries. The original MOCNESS (Wiebe et al, 1976) was a redesigned and improved version of a system described by Frost and McCrone (1974). (from MOCNESS manual)

Dataset-specific Instrument Name	Optical Plankton Counter
Generic Instrument Name	Optical Plankton Counter
Dataset-specific Description	OPC mounted on MOCNESS-1 frame.
Generic Instrument Description	An OPC provides quantitative measurements of abundance and sizes of mesozooplankton ranging between approximately 0.25 and 14 mm in Equivalent Spherical Diameter (ESD), and has the capability to integrate measurements from other sensors such as a CTD, fluorometer and Global Positioning System (GPS). It can be deployed on a variety of instruments such as SeaSoar, Aries, Scanfish, MOCNESS, a bongo net or simple towing frame. The data from an OPC are typically transmitted to a data acquisition computer through two conducting wires in a towing cable at real time, but it can also be modified to have an internal memory. Large amounts of data are produced. The procedures employed by OPC users vary from; i) estimating integrated biomass by integrating the OPC size distributions, ii) comparing size distributions between OPC and net samples, and iii) simply isolating a size region in the OPC size distribution which correspond solely to specific taxa, eg. Calanus spp.. from: Zhou, M., Tande, K., 2002. Optical Plankton Counter Workshop. GLOBEC Report 17, University of Tromso, Tromso

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Deployments

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

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

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

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

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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)	unknown SOGLOBEC NSF ANT

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