

# Video Plankton Recorder data from RVIB Nathaniel B. Palmer (NBP0103, NBP0104, NBP0202) in the Southern Ocean from 2001-2002 (SOGLOBEC project, Southern Ocean Krill project)

Website: <https://www.bco-dmo.org/dataset/2823>

Version: 2011-05-09

## Project

- » [U.S. GLOBEC Southern Ocean](#) (SOGLOBEC)
- » [GLOBEC: Winter Distribution and Success of Southern Ocean Krill](#) (Southern Ocean Krill)

## Programs

- » [U.S. GLOBal ocean ECosystems dynamics](#) (U.S. GLOBEC)
- » [U.S. GLOBal ocean ECosystems dynamics](#) (U.S. GLOBEC)

Contributors	Affiliation	Role
<a href="#">Ashjian, Carin J.</a>	Woods Hole Oceanographic Institution (WHOI)	Principal Investigator
<a href="#">Allison, Dicky</a>	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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## Dataset Description

### Video Plankton Recorder Data

These data are from images of plankton and particles collected using the Video Plankton Recorder (VPR), a camera system mounted on the BIO -Optical Multi-frequency Acoustical and Physical Environmental Recorder (BIOMAPER II)<sup>1</sup> data acquisition system.

BIOMAPERII is a towed package consisting of a number of independent observational components: a multi-frequency sonar (Acoustics) system, a video plankton recorder (VPR) system, and an environmental sensor system (ESS).

Companion object: [biomaperII](#).

<sup>1</sup>Wiebe, P.H., et al., 2002, BIOMAPER-II: An Integrated Instrument Platform for Coupled Biological and Physical Measurements in Coastal and Oceanic Regimes. IEEE Journal of Oceanic Engineering, **27(3)**:700-716.

## Methodology

Detailed discussion of the data and sampling methods used here can be found in C.J. Ashjian et al., 2008. Distribution of larval krill and zooplankton in association with hydrography in Marguerite Bay, Antarctic Peninsula, in austral fall and winter 2001 described using the Video Plankton Recorder. Deep- Sea Research II **55/3-4**(2008), pp. 455-471.

## Any questions, contact:

Carin Ashjian, Associate Scientist

Woods Hole Oceanographic Institution  
Woods Hole, MA 02543  
voice: (508) 289-3457  
fax: (508) 457-2169  
e-mail: [cashjian@whoi.edu](mailto:cashjian@whoi.edu)

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## Methods & Sampling

These data are from images of plankton and particles collected using the Video Plankton Recorder (VPR), a camera system mounted on the BIO -Optical Multi-frequency Acoustical and Physical Environmental Recorder (BIOMAPER II)1 data acquisition system. BIOMAPER II is a towed package consisting of a number of independent observational components: a multi-frequency sonar (Acoustics) system, a video plankton recorder (VPR) system, and an environmental sensor system (ESS).

## Data Processing Description

Detailed discussion of the data and sampling methods used here can be found in C.J. Ashjian et al., 2008. Distribution of larval krill and zooplankton in association with hydrography in Marguerite Bay, Antarctic Peninsula, in austral fall and winter 2001 described using the Video Plankton Recorder. Deep- Sea Research II 55/3-4(2008), pp. 455-471.

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## Data Files

File
<b>vpr_cashjian.csv</b> (Comma Separated Values (.csv), 83.79 MB) MD5:53e1d6b4e9ddfe2d372dbd83fc410baf Primary data file for dataset ID 2823

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## Parameters

Parameter	Description	Units
cruiseid	cruise identification	
year	year, i.e. 2001, GMT	
yrday0_gmt	Year day where Jan 1 = year day 0, GMT	YYY.Y
month_gmt	month of year, GMT, i.e. 01-12	
day_gmt	day of month, GMT, i.e. 01-31	

time_gmt	time of day, GMT	
lat	negative = South	decimal degrees
lon	negative = West	decimal degrees
press	depth of sample/data point, reported as pressure	decibars
potemp	potential temperature	degrees C
sal	salinity, PSS	dimensionless
sigma_0	potential density (sigma theta)	kilograms/cubic meter
flvolts	fluorescence (volts 0-5)	volts
trans_v	light transmission, reported as volts	volts
depth_w	water depth in meters	meters
copepods	number of copepods	number/Liter
larvaceans	number of larvaceans per liter	number/Liter
larval_euph	larval euphausiids	number/Liter
marine_snow	Particles of plankton	number/Liter
pteropods	number of pteropods per liter	number/Liter
radiolarians	number of radiolarians per liter	number/Liter
polychaetes	number of polychaetes per liter	number/Liter
diatoms	diatoms	number/Liter
algal_mat	algal mats	number/Liter

## Instruments

<b>Dataset-specific Instrument Name</b>	Blo-Optical Multi-frequency Acoustical and Physical Environmental Recorder II
<b>Generic Instrument Name</b>	Blo-Optical Multi-frequency Acoustical and Physical Environmental Recorder II
<b>Generic Instrument Description</b>	<p>BIOMAPER II is a set of sensors on a long aluminum frame that resembles the tail of a World War II airplane. A research vessel tows the instrument through the water on a specialized tow cable that sends power to the sensors and brings data back to the ship. People use BIOMAPER II to learn about phytoplankton and zooplankton over areas that are too large to study with the traditional net-and-microscope method. Whereas nets can sample areas up to about 5 meters (16 feet) on a side, BIOMAPER II can record data from 500 meters (1,640 feet) or more of the water column at a time. The instrument's standard suite of sensors were chosen for studying plankton: a five-frequency sonar system, a video plankton recorder and an environmental sensor system (ESS, like the one on MOCNESS). The ESS measures water temperature, salinity, oxygen, chlorophyll and light levels. BIOMAPER II also has room for attaching other instruments for specific uses. The instrument's official name is BIOMAPER-II: the Blo-Optical Multi-frequency Acoustical and Physical Environmental Recorder. The Roman numeral II indicates that it's a redesign of the original BIOMAPER, a prototype that was invented and tested in the mid 1990s. (more information).</p>

<b>Dataset-specific Instrument Name</b>	Video Plankton Recorder
<b>Generic Instrument Name</b>	Video Plankton Recorder
<b>Generic Instrument Description</b>	<p>The Video Plankton Recorder (VPR) is a video-microscope system used for imaging plankton and other particulate matter in the size range from a few micrometers to several centimeters. The VPR is essentially an underwater microscope. It consists of four video cameras (with magnifying optics) synchronized at 60 fields per second (fps) to a red-filtered 80 W xenon strobe (pulse duration = 1 microsecond). The current lens on each camera can be adjusted to provide a field of view between 5 mm and 10 cm. Use of higher magnification lenses is currently being explored for viewing protozoans (less than 1 micrometer resolution). The four cameras are set for concentric viewing fields so that a range of up to four magnifications can be viewed simultaneously, allowing a wide size range of plankton to be sampled. Depth of field is adjusted by the lens aperture setting, and the volume sampled in each video field ranges from about 1 ml to 1 liter, depending on lens settings. The cameras have been configured for stereoscopic viewing as well. A strobe on the other arm illuminates the imaged volume and flashes 60 times per second, producing 60 images per second of the particles and plankton in the water. The images are then saved internally on a computer hard disk and later plotted. Deployment: Most commonly, the VPR is mounted in a frame and lowered into the water from the stern of the ship. Sometimes, a CTD also is mounted next to the VPR to collect depth, temperature, and salinity information at the same time as each video image. The instrument is lowered down through the water to a maximum depth of 350 meters to generate a profile of plankton/particle abundance and taxon group along with temperature and salinity. In addition to the towed configuration for mapping plankton distributions, it is possible to deploy the VPR in a fixed position (on a mooring) for viewing plankton swimming behaviors in two or three dimensions. The VPR instrument system has been used in both configurations, and deployment on ROVs has been proposed. This definition was taken from the WHOI Ocean Instruments Web site and from a US GLOBEC Newsletter.</p>

## Deployments

### NBP0103

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57636">https://www.bco-dmo.org/deployment/57636</a>
<b>Platform</b>	RVIB Nathaniel B. Palmer
<b>Report</b>	<a href="http://globec.who.edu/so-dir/reports/nbp0103/nbp0103.html">http://globec.who.edu/so-dir/reports/nbp0103/nbp0103.html</a>
<b>Start Date</b>	2001-04-24
<b>End Date</b>	2001-06-05
<b>Description</b>	<p><b>Methods &amp; Sampling</b></p> <p>These data are from images of plankton and particles collected using the Video Plankton Recorder (VPR), a camera system mounted on the BIO -Optical Multi-frequency Acoustical and Physical Environmental Recorder (BIOMAPER II)1 data acquisition system. BIOMAPERII is a towed package consisting of a number of independent observational components: a multi-frequency sonar (Acoustics) system, a video plankton recorder (VPR) system, and an environmental sensor system (ESS).</p> <p><b>Processing Description</b></p> <p>Detailed discussion of the data and sampling methods used here can be found in C.J. Ashjian et al., 2008. Distribution of larval krill and zooplankton in association with hydrography in Marguerite Bay, Antarctic Peninsula, in austral fall and winter 2001 described using the Video Plankton Recorder. Deep- Sea Research II 55/3-4(2008), pp. 455-471.</p>

### NBP0104

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57638">https://www.bco-dmo.org/deployment/57638</a>
<b>Platform</b>	RVIB Nathaniel B. Palmer
<b>Report</b>	<a href="http://www.ccpo.odu.edu/Research/globec/cruises01/nbp0104_menu.html">http://www.ccpo.odu.edu/Research/globec/cruises01/nbp0104_menu.html</a>
<b>Start Date</b>	2001-07-22
<b>End Date</b>	2001-08-31
<b>Description</b>	<p><b>Methods &amp; Sampling</b></p> <p>These data are from images of plankton and particles collected using the Video Plankton Recorder (VPR), a camera system mounted on the BIO -Optical Multi-frequency Acoustical and Physical Environmental Recorder (BIOMAPER II)1 data acquisition system.</p> <p><b>Processing Description</b></p> <p>Detailed discussion of the data and sampling methods used here can be found in C.J. Ashjian et al., 2008. Distribution of larval krill and zooplankton in association with hydrography in Marguerite Bay, Antarctic Peninsula, in austral fall and winter 2001 described using the Video Plankton Recorder. Deep- Sea Research II 55/3-4(2008), pp. 455-471.</p>

### NBP0202

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57641">https://www.bco-dmo.org/deployment/57641</a>
<b>Platform</b>	RVIB Nathaniel B. Palmer
<b>Report</b>	<a href="http://globec.who.edu/so-dir/reports/nbp0202/nbp0202b.html">http://globec.who.edu/so-dir/reports/nbp0202/nbp0202b.html</a>
<b>Start Date</b>	2002-04-09
<b>End Date</b>	2002-05-21
<b>Description</b>	<p><b>Methods &amp; Sampling</b></p> <p>VPR data</p>

## Project Information

### U.S. GLOBEC Southern Ocean (SOGLOBEC)

**Website:** [http://www.ccpo.odu.edu/Research/globec\\_menu.html](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.

### GLOBEC: Winter Distribution and Success of Southern Ocean Krill (Southern Ocean Krill)

**Coverage:** Southern Ocean

The U.S. Global Ocean Ecosystems Dynamics (U.S. GLOBEC) program has the goal of understanding and ultimately predicting how populations of marine animal species respond to natural and anthropogenic changes in climate. Research in the Southern Ocean (SO) indicates strong coupling between climatic processes and ecosystem dynamics via the annual formation and destruction of sea ice. The Southern Ocean GLOBEC Program (SO GLOBEC) will investigate the dynamic relationship between physical processes and ecosystem responses through identification of critical parameters that affect the distribution, abundance and population dynamics of target species. The overall goals of the SO GLOBEC program are to elucidate shelf circulation processes and their effect on sea ice formation and krill distribution, and to examine the factors which govern krill survivorship and availability to higher trophic levels, including penguins, seals and whales. The focus of the U.S. contribution to the international SO GLOBEC program will be on winter processes. This component will focus on juvenile and adult krill and mesozooplankton prey distribution and abundance using a sophisticated instrument package, BIOMAPPER II, which is equipped with an acoustic backscatter sonar system, a video plankton recorder and an environmental sensor system. The system is used in large-scale studies. Additionally, a remotely-operative vehicle will be used to map the distribution and behavior of krill under ice. The result of the integrated SO GLOBEC program will be to improve the predictability of living marine resources, especially with respect to local and global climatic shifts.

## 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).

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

**Website:** <http://www.usglobec.org/>

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## **Funding**

Funding Source	Award
<a href="#">NSF Antarctic Sciences (NSF ANT)</a>	<a href="#">ANT-9910307</a>

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