

MOCNESS tow depths of zooplankton & fecal pellet preserved samples from R/V New Horizon cruise NH1008 in Monterey Bay, near MBARI buoy M1 (36.747°N, 122.022°W); 2010 (GATEKEEPERS project)

Website: <https://www.bco-dmo.org/dataset/3730>

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Project

» [Zooplankton feeding at the base of the particle maximum: Gatekeepers of the Vertical Flux?](#) (GATEKEEPERS)

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Dataset Description

MOCNESS - Depths of Zooplankton & Fecal Pellet Preserved Samples

Notes:

MN depth data inaccurate. Depth data estimated using sigma-theta values from MN to obtain corresponding depth values from ODF CTD casts taken at approx. same location and time.

Upper depths of zero are surface and assumed to be zero.

Upper depths that are "nd" are from a sigma-theta value on the MN that corresponds to CTD depths <5m, of which there are no ODF CTD data for.

Methods & Sampling

(In Progress)

Data Processing Description

BCO-DMO Processing/Edits

- Generated from original file "MN_depths_13Dec2010_JFB.xls" contributed by Jessica Forrest-Baldini

- MN Tow PDT Date, PDT Time, Lat, Lon inserted from event log
- Parameter names modified to conform to BCO-DMO conventions (blanks to underscores, etc.)
- Parameter "Type" modified to "Sample_Type"
- "NaN" replaced with "nd" (no data)

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Data Files

File
MOCNESS_Depths.csv (Comma Separated Values (.csv), 11.84 KB) MD5:004c071ea10f87aca98e00535e696bec Primary data file for dataset ID 3730

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Parameters

Parameter	Description	Units
MN_Tow	MOCNESS Tow Number	Dimensionless
CTD_Cast	CTD Cast Number	Dimensionless
ISO_DateTime_Local	Deployment Start Date/Time (PDT) ISO formatted	YYYY-MM-DDTHH:MM:SS.xx[+/-TZ]
Date_Local	Deployment Start Date (PDT)	YYYYMMDD
Time_Local	Deployment Start Time (PDT)	HHMMSS
Latitude	Deployment Start Latitude (South is negative)	decimal degrees
Longitude	Deployment Start Longitude (West is negative)	decimal degrees
Preserved_Sample_Net_Number	Preserved Sample Net Number	Dimensionless
Sample_Type	Sample Type: Zooplank=1 Fecal Pellet=2	Dimensionless
Target_Depth_Lower	Target Depth Lower	meters

Target_Depth_Upper	Target Depth Upper	meters
MOCNESS_Depth_Readings_Lower	MOCNESS Depth Readings Lower	meters
MOCNESS_Depth_Readings_Upper	MOCNESS Depth Readings Upper	meters
Sigma_Theta_Lower	Density sigma-theta Lower	Kg/m ³
Sigma_Theta_Upper	Density sigma-theta Upper	Kg/m ³
Derived_Depth_Lower	Derived Depth Lower	meters
Derived_Depth_Upper	Derived Depth Upper	meters

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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) This designation is used when the specific type of MOCNESS (number and size of nets) was not specified by the contributing investigator.

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Deployments

NH1008

Website	https://www.bco-dmo.org/deployment/58852
Platform	R/V New Horizon
Report	http://bcodata.whoi.edu/GATEKEEPERS/cruise_plan_checkley_nh_8_25_jul_10_v3.pdf
Start Date	2010-07-08
End Date	2010-07-25
Description	Collaborative Research: Zooplankton at the Base of the Particle Maximum: Gatekeepers of the Vertical Flux?: Deployment and recovery of SOLOPCs in Monterey Bay, plus CTD and MOCNESS deployments in Monterey Bay Cruise information and original data are available from the NSF R2R data catalog. Figure 1. R/V New Horizon Cruise NH1008 GATEKEEPERS [click on the image to view a larger version]

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Project Information

Zooplankton feeding at the base of the particle maximum: Gatekeepers of the Vertical Flux? (GATEKEEPERS)

Website: <http://iod.ucsd.edu/gatekeeper/>

Coverage: Monterey Bay, CA and waters offshore

Zooplankton feeding at the base of the particle maximum: Gatekeepers of the Vertical Flux?

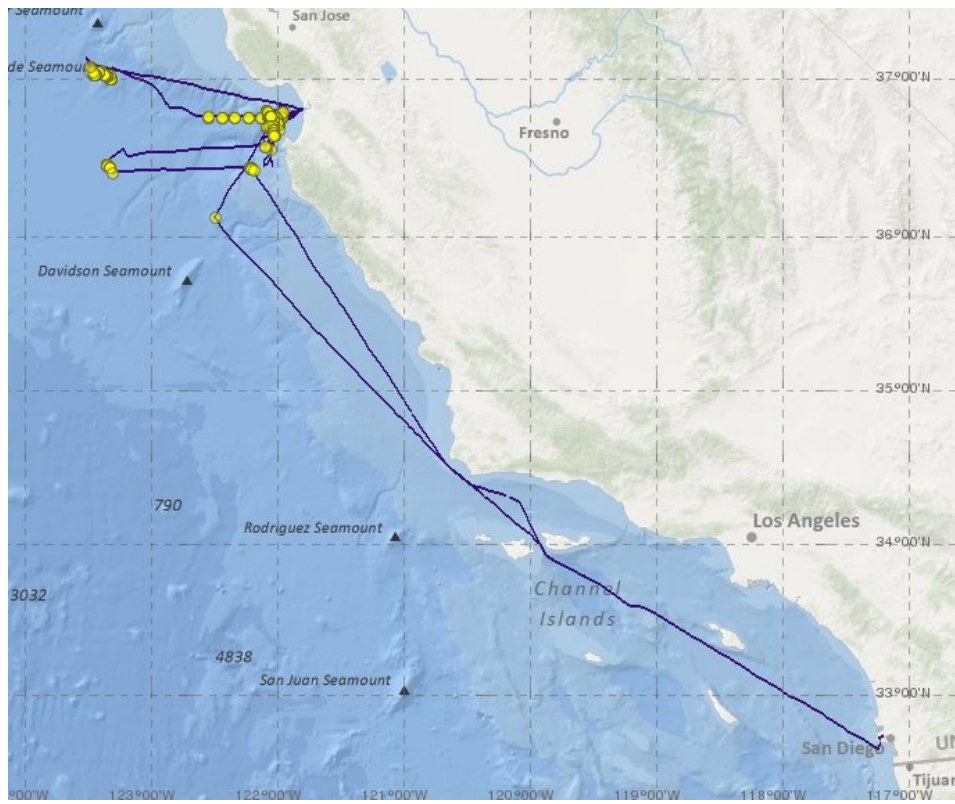
A range of observations suggest that zooplankton act as gatekeepers for material leaving the euphotic zone. This study will investigate the interactions of zooplankton with other particles using a suite of autonomous and tethered instruments in conjunction with finescale water sampling. The SOLOPC (Sounding Oceanographic Observer with Laser Optical Plankton Counter) will be the autonomous instrument and provide hourly profiles of zooplankton and other particles. Previous sampling with the SOLOPC indicated a diel cycle of production and abundance of particles in the euphotic zone and their sinking and consumption, presumably by zooplankton observed at the base of the particle abundance maximum. The SOLOPC senses particles, including zooplankton and aggregates, and measures their equivalent spherical diameters which can be used to compute particle size spectra. However, it is difficult to use the SOLOPC to distinguish among particle types, such as copepods, larvaceans, and aggregates, particularly if they are small. The research will include an intensive field study that will take place in Monterey Bay and use adaptive sampling to observe near SOLOPCs with a new, AUV-borne imaging system, ship-based CTD and MOCNESS sampling, and MBARI's ROV Ventana. The investigators will alter a SOLOPC to be stationary relative to an isopycnal and use the particle counts that it accumulates to calculate a flux spectrum. They will combine the flux and concentration spectra to estimate particle sinking velocities as a function of particle diameter. Zooplankton feeding in the water column will be estimated by analyzing the gut fluorescence of animals caught in zooplankton nets and by counting the distribution of fecal pellets in water samples. Results will enhance the understanding of the role of the zooplankton as gatekeepers in the vertical flux of particles and, hence, the biological pump. The study will also provide new insight into factors that affect zooplankton behavior and ecology.

Collaborating institutions include SIO, TAMU, LUMCON, MBARI, BIO, and Université Paris VI. The SOLOPC, modified to measure flux as well as profile, and REFLICS are intended for acquisition and use by other researchers worldwide. The understanding we gain of role of the zooplankton as gatekeepers of the vertical flux will contribute valuably to understanding of the biological pump and the carbon cycle.

PUBLICATIONS PRODUCED AS A RESULT OF THIS RESEARCH

Jackson, GA and DM Checkley Jr. "Particle size distributions in the upper 100 m water column and their implications for animal feeding in the plankton," *Deep-Sea Research*, 2011.

Figure 1. R/V New Horizon Cruise NH1008 GATEKEEPERS
[click on the image to view a larger version]



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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0927863
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