

LOPC data: microplankton size spectra from 0.1 to 35 mm from R/V Pelican PE08-54, PE09-12, PE10-01 in the Northwest Florida shelf off Panama City FL. from 2008-2009 (BenDiM project)

Website: <https://www.bco-dmo.org/dataset/3787>

Version:

Version Date: 2012-12-12

Project

» [Benthic Dinoflagellate Migration: Occurrence and Processes](#) (BenDiM)

Contributors	Affiliation	Role
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Dataset Description

Data consists of particle counts and sizes from 0.1 mm to 35 mm measured using a Brooke Ocean Technology Laser Optical Plankton Counter (LOPC). The LOPC was deployed on a CTD during a cross-shelf transect.

Related references:

Laser Optical Plankton Counter Operation and Maintenance Manual. 2010. Brooke Ocean Technology (www.brooke-ocean.com).

Herman AW. LOPC post-processing page: http://www.alexherman.com/lopc_post.php. Contains software designed to enable first-time users of the LOPC to process data.

Herman AW, M Harvey. 2006. Application of normalized biomass size spectra to laser optical plankton counter net intercomparisons of zooplankton distributions. *Journal of Geophysical Research-Oceans*. 111(C5): C05S05.

Herman AW, B Beanlands, EF Phillips. 2004. The next generation of Optical Plankton Counter: the Laser-OPC. *Journal of Plankton Research*. 26(10): 1135-1145.

Methods & Sampling

Underway SeaSciences Acrobat surveys with the instrument package undulating through the water column between the 25-60 m isobaths provided near-surface to near-bottom (5-10 m off bottom inside the 40 m isobath and 10-20 m off bottom beyond the 40 m isobath) surveys.

Data Processing Description

Setup and Calibration Information for Acrobat TUV:

[BenDiM1/PE08-54](#)

[BenDiM2/PE09-12](#)

[BenDiM3/PE10-01](#)

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Data Files

File
lopc.csv (Comma Separated Values (.csv), 397.48 MB) MD5:2a3164053964a41915f1815296915f87 Primary data file for dataset ID 3787

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Parameters

Parameter	Description	Units
time_elapsed	Elapsed time since start of tow	seconds
distance	distance from start of tow	km
lat	latitude; North is positive	decimal degrees
lon	longitude; East is positive	decimal degrees
depth	depth	meters
press	pressure	decibars
temp	temperature	degrees Celsius
potemp	potential temperature	degrees Celsius
cond	conductivity	Siemens/meter
sal	salinity	dimensionless
sigma_0	potential density; sigma-theta	dimensionless
O2	dissolved oxygen	milliliters/liter
O2_sat_pcmt	saturation of oxygen	%
turbidity	Turbidity is the cloudiness or haziness of a fluid caused by individual particles. Formazin Turbidity Units (FTU). ISO refers to its units as FNU (Formazin Nephelometric Units)	FTU
chl_a	chlorophyll	micrograms/liter
CDOM	Colored dissolved organic matter (CDOM): The optically measurable component of the dissolved organic matter in water	micrograms/liter
biomass	sum of biovolumes across all the size ranges	micrometers/m ³
vol_x_y_um	volume of particles in the size range from x to y calculated from the estimated spherical diameter (ESD)	micrometers/m ³

Instruments

Dataset-specific Instrument Name	Laser Optical Plankton Counter
Generic Instrument Name	Laser Optical Plankton Counter
Dataset-specific Description	A Brooke-Ocean Laser Optical Plankton Counter (LOPC) for plankton size spectra from 0.1 mm to 35 mm was deployed for and underway SeaSciences Acrobat surveys with the instrument package undulating through the water column between the 25-60 m isobaths provided near-surface to near-bottom (5-10 m off bottom inside the 40 m isobath and 10-20 m off bottom beyond the 40 m isobath) surveys.
Generic Instrument Description	Laser Optical Plankton Counter (LOPC)

Dataset-specific Instrument Name	towed undulating vehicle
Generic Instrument Name	towed undulating vehicle
Dataset-specific Description	SeaSciences Acrobat is a towed undulated vehicle (TUV) carrying an instrument package. Cross-shelf survey were obtained using a SeaBird CTD package instrumented with SeaBird temperature, salinity, and dissolved oxygen sensors; SeaPoint chlorophyll and CDOM fluorescence and turbidity sensors; and a Brooke-Ocean Laser Optical Plankton Counter (LOPC) for plankton size spectra from 0.1 mm to 35 mm.
Generic Instrument Description	A towed undulating vehicle is a generic class of instruments. See the data set specific information for a detailed description. These are often prototype instrument packages designed to make very specific measurements.

Deployments

PE08-54

Website	https://www.bco-dmo.org/deployment/58880
Platform	R/V Pelican
Start Date	2008-05-15
End Date	2008-05-21
Description	Acrobat surveys and CTD/rosettes transects Cruise information and original data are available from the NSF R2R data catalog.

PE09-12

Website	https://www.bco-dmo.org/deployment/58881
Platform	R/V Pelican
Start Date	2008-10-15
End Date	2008-10-20
Description	Acrobat surveys and CTD/rosettes transects Cruise information and original data are available from the NSF R2R data catalog.

PE10-01

Website	https://www.bco-dmo.org/deployment/58882
Platform	R/V Pelican
Start Date	2009-07-08
End Date	2009-07-15
Description	Acrobat surveys and CTD/rosettes transects Cruise information and original data are available from the NSF R2R data catalog.

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Project Information

Benthic Dinoflagellate Migration: Occurrence and Processes (BenDiM)

Coverage: Northwest Florida shelf off Panama City, FL

Most applications of the standardized dinoflagellate diel vertical migration (DVM) hypothesis consider a surface goal in daylight and a subsurface nutrient goal at night because of the visibility of surface blooms. The subsurface nutrient source, however, can be so deep that dinoflagellates are unable to reach the surface during a 12 h ascent. At least three literature reports document a sediment-oriented expression of an alternative DVM pattern characteristic of continental boundaries with wider, more gently sloping shelves that can yield high biomass, near-bottom dinoflagellate accumulations. The targeted dinoflagellate niche, here termed 'Benthic Dinoflagellate Migration' or 'BenDiM', is influenced by light and nutrient gradients but is unique in that a DVM exists between a nutrient source near or at the sediment-sea interface and a light intensity in the lower euphotic zone that supports a net increase in population size. The project specifically deals with: 1) the different dinoflagellate species that occupy the BenDiM niche on the continental shelf off Panama City, FL between the 60 m and 20 m contours between May and Nov; 2) the light acclimation, the nutrient uptake capabilities, and the behavioral patterns required of different dinoflagellate species that occupy the BenDiM niche; and, 3) the effect of representative physical water motion on the formation, transport and fate of the different BenDiM dinoflagellate species populations. The study includes: 1) a pelagic/benthic field program with three 7-day cruises during different months between May and Oct in 2008 and Jul 2009; 2) laboratory studies on the light, nutrient, and behavioral characteristics of BenDiM dinoflagellates that allow successful competition with near-bottom pelagic diatoms and the microphytobenthos; and 3) a physical-biological modeling study to plan, integrate and extend the field and laboratory results. The cruise program applies standard UNOLS ship capabilities extended with instrumentation that includes: 1) an Acrobat undulating system instrumented with SeaBird CTD-O2 system, Biospherical PAR, SeaPoint Chlorophyll and CDOM Fluorometers, Seapoint Turbidity, Satlantic ISUS Nitrate Sensor, Brooke-Oceans Laser Optical Plankton Counter, and General Oceanics Flow Meter with integrated GPS and echo sounding location system and a real-time graphical display of the collected data, 2) the FlowCAM, and 3) the autonomous vertical profiler (AVP). The laboratory effort applies a proven motion analysis system for studying dinoflagellate behavior and a well-developed mesocosm capability for studying dinoflagellate physiology, biochemistry, and behavior. The modeling effort builds on an existing, biologically intense modeling approach that incorporates parameterization of dinoflagellate physiology, biochemistry and behavior in a representative physical field.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0726271

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