Video Plankton Recorder data from R/V Columbus Iselin and R/V Endeavor in the Gulf of Maine and Georges Bank from 1994-1995 (GB project)

Website: https://www.bco-dmo.org/dataset/3680
Version: 2012-07-26

Project
» U.S. GLOBEC Georges Bank (GB)

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

Contributors	Affiliation	Role
Ashjian, Carin J.	Woods Hole Oceanographic Institution (WHOI)	Principal Investigator
Allison, Dicky	Woods Hole Oceanographic Institution (WHOI)	BCO-DMO Data Manager

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Dataset Description

This dataset was derived from the VPR_ashjian_orig dataset. In the 'nonzero' dataset, values of 0 in the abund_L column (taxon abundance) have been removed in order to allow the dataset to be mapped.

Methodology
The following information was extracted from *C.J. Ashjian et al., Deep- Sea Research II 48(2001) 245-282* . An in-depth discussion of the data and sampling methods can be found there.

The Video Plankton Recorder was towed at 2 m/s, collecting data from the surface to the bottom (towyo). The VPR was equipped with 2-4 cameras, temperature and conductivity probes, fluorometer and transmissometer. Environmental data was collected at 0.25 Hz (CI9407) or 0.5 Hz (EN259, EN262). Video images were recorded at 60 fields per second (fps).

Video tapes were analyzed for plankton abundances using a semi-automated method discussed in *Davis, C.S. et al., Deep-Sea Research II 43 (1996) 1946-1970*. In-focus images were extracted from the video tapes and identified by hand to particle type, taxon, or species. Plankton and particle observations were merged with environmental and navigational data by binning the observations for each category into the time intervals at which the environmental data were collected (again see above *Davis* citation). Concentrations were calculated utilizing the total volume (liters) imaged during that period. For less-abundant categories, usually only a single organism was observed during each time interval so that the resulting concentrations are close to presence or absence data rather than covering a range of values.

Methods & Sampling

The Video Plankton Recorder was towed at 2 m/s, collecting data from the surface to the bottom (towyo). The

VPR was equipped with 2-4 cameras, temperature and conductivity probes, fluorometer and transmissometer. Environmental data was collected at 0.25 Hz (CI9407) or 0.5 Hz (EN259, EN262). Video images were recorded at 60 fields per second (fps).

Data Processing Description

Video tapes were analyzed for plankton abundances using a semi-automated method discussed in Davis, C.S. et al., Deep-Sea Research II 43 (1996) 1946-1970. In-focus images were extracted from the video tapes and identified by hand to particle type, taxon, or species. Plankton and particle observations were merged with environmental and navigational data by binning the observations for each category into the time intervals at which the environmental data were collected (again see above Davis citation). Concentrations were calculated utilizing the total volume (liters) imaged during that period. For less-abundant categories, usually only a single organism was observed during each time interval so that the resulting concentrations are close to presence or absence data rather than covering a range of values.

To generate the nonzero dataset, BCO-DMO created a subset of the data where abund_L <> 0.00. See VPR_ashjian_orig dataset for complete data, including values of 0. Because the complete dataset is so large, it will take longer to load.

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Data Files

File
vpr_cashjian_nonzero.csv (Comma Separated Values (.csv), 6.49 MB) MD5:cda406bc3e19c8054725195b32f56e48 Primary data file for dataset ID 3680

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Parameters

Parameter	Description	Units
cruiseid	Cruise identification	
year	year GMT	
yrday0_gmt	year day, Jan 1 = 0, GMT	YYY.Y
month_gmt	month, GMT	
day_gmt	day of tow, GMT	
time_gmt	hour and decimal minute of binned video image, GMT	HHmm.m
lat	latitude, negative = south	decimal degrees

lon	longitude, negative = west	decimal degrees
press	pressure, depth of data interval	decibars
temp	temperature	degrees centigrade
sal	salinity, derived using Neil Brown software	PSU
sigma_t	sigma_t, density	kilograms/meter³
flvolt	fluorescence	volts
fluor	fluorescence	relative units
trans_v	light transmission	volts
dist_along_track	distance along ship's track	kilometers

taxon	Name of the taxonomic group. Hydroids = asexual hydroid phase of Cnidarians Other = other zooplankton not categorized Calanus = Calanus sp. but likely finmarchicus Phaeoproto = Phaeocystis spp. protocolonies Marinesnow = Particles of plankton Pseudocalanus = Pseudocalanus spp. Cope_uid = unidentified copepods Pseudow egg = Pseudocalanus with eggs Medusa_uid = unidentified medusa Algalmat = Collections of diatom chains Dino_Ceratium = Ceratium spp. Diat_Csocialis = Chaetoceros socialis Diat_Chaetoceros = Chaetoceros spp. Cyclopoid_uid = unidentified cyclopoid Unidentified = unidentified objects Centropages = Centropages spp. Oithona = Oithona spp.	dimensionless
abund_L	Taxon abundance (number per Liter). Note: 1 cubic meter = 1,000 L.	number/Liter
brief_desc	Brief description of the type of cruise.	dimensionless

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Instruments

Dataset-specific Instrument Name	Video Plankton Recorder
Generic Instrument Name	Video Plankton Recorder
Dataset-specific Description	Video Plankton Recorder, a towed vehicle. The Video Plankton Recorder was towed at 2 m/s, collecting data from the surface to the bottom (towyo). The VPR was equipped with 2-4 cameras, temperature and conductivity probes, fluorometer and transmissometer. Environmental data was collected at 0.25 Hz (CI9407) or 0.5 Hz (EN259, EN262). Video images were recorded at 60 fields per second (fps).
Generic Instrument Description	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.

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Deployments

CI9407

Website	https://www.bco-dmo.org/deployment/57391
Platform	R/V Columbus Iselin
Report	http://globec.whoi.edu/globec-dir/reports/ci9407/CI9407.pdf
Start Date	1994-05-25
End Date	1994-06-16
Description	process zoology **Methods & Sampling** The Video Plankton Recorder was towed at 2 m/s, collecting data from the surface to the bottom (towyo). The VPR was equipped with 2-4 cameras, temperature and conductivity probes, fluorometer and transmissometer. Environmental data was collected at 0.25 Hz (CI9407) or 0.5 Hz (EN259, EN262). Video images were recorded at 60 fields per second (fps). **Processing Description** Video tapes were analyzed for plankton abundances using a semi-automated method discussed in Davis, C.S. et al., Deep-Sea Research II 43 (1996) 1946-1970. In-focus images were extracted from the video tapes and identified by hand to particle type, taxon, or species. Plankton and particle observations were merged with environmental and navigational data by binning the observations for each category into the time intervals at which the environmental data were collected (again see above Davis citation). Concentrations were calculated utilizing the total volume (liters) imaged during that period. For less-abundant categories, usually only a single organism was observed during each time interval so that the resulting concentrations are close to presence or absence data rather than covering a range of values. To generate the nonzero dataset, BCO-DMO created a subset of the data where abund_L <> 0.00.

EN259

Website	https://www.bco-dmo.org/deployment/57399
Platform	R/V Endeavor
Report	http://globec.whoi.edu/globec-dir/reports/en259.html
Start Date	1995-01-10
End Date	1995-01-22
Description	process zoology **Methods & Sampling** The Video Plankton Recorder was towed at 2 m/s, collecting data from the surface to the bottom (towyo). The VPR was equipped with 2-4 cameras, temperature and conductivity probes, fluorometer and transmissometer. Environmental data was collected at 0.25 Hz (CI9407) or 0.5 Hz (EN259, EN262). Video images were recorded at 60 fields per second (fps). **Processing Description** Video tapes were analyzed for plankton abundances using a semi-automated method discussed in Davis, C.S. et al., Deep-Sea Research II 43 (1996) 1946-1970. In-focus images were extracted from the video tapes and identified by hand to particle type, taxon, or species. Plankton and particle observations were merged with environmental and navigational data by binning the observations for each category into the time intervals at which the environmental data were collected (again see above Davis citation). Concentrations were calculated utilizing the total volume (liters) imaged during that period. For less-abundant categories, usually only a single organism was observed during each time interval so that the resulting concentrations are close to presence or absence data rather than covering a range of values. To generate the nonzero dataset, BCO-DMO created a subset of the data where abund_L <> 0.00.

EN262

Website	https://www.bco-dmo.org/deployment/57402
Platform	R/V Endeavor
Report	http://globec.whoi.edu/globec-dir/reports/en262/EN262.pdf
Start Date	1995-02-23
End Date	1995-03-10
Description	process zoology **Methods & Sampling** The Video Plankton Recorder was towed at 2 m/s, collecting data from the surface to the bottom (towyo). The VPR was equipped with 2-4 cameras, temperature and conductivity probes, fluorometer and transmissometer. Environmental data was collected at 0.25 Hz (CI9407) or 0.5 Hz (EN259, EN262). Video images were recorded at 60 fields per second (fps). **Processing Description** Video tapes were analyzed for plankton abundances using a semi-automated method discussed in Davis, C.S. et al., Deep-Sea Research II 43 (1996) 1946-1970. In-focus images were extracted from the video tapes and identified by hand to particle type, taxon, or species. Plankton and particle observations were merged with environmental and navigational data by binning the observations for each category into the time intervals at which the environmental data were collected (again see above Davis citation). Concentrations were calculated utilizing the total volume (liters) imaged during that period. For less-abundant categories, usually only a single organism was observed during each time interval so that the resulting concentrations are close to presence or absence data rather than covering a range of values. To generate the nonzero dataset, BCO-DMO created a subset of the data where abund_L <> 0.00.

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Project Information

U.S. GLOBEC Georges Bank (GB)

Website: http://globec.whoi.edu/globec_program.html

Coverage: Georges Bank, Gulf of Maine, Northwest Atlantic Ocean

The U.S. GLOBEC Georges Bank Program is a large multi- disciplinary multi-year oceanographic effort. The proximate goal is to understand the population dynamics of key species on the Bank - Cod, Haddock, and two species of zooplankton (*Calanus finmarchicus* and *Pseudocalanus*) - in terms of their coupling to the physical environment and in terms of their predators and prey. The ultimate goal is to be able to predict changes in the distribution and abundance of these species as a result of changes in their physical and biotic environment as well as to anticipate how their populations might respond to climate change.

The effort is substantial, requiring broad-scale surveys of the entire Bank, and process studies which focus both on the links between the target species and their physical environment, and the determination of fundamental aspects of these species' life history (birth rates, growth rates, death rates, etc).

Equally important are the modelling efforts that are ongoing which seek to provide realistic predictions of the flow field and which utilize the life history information to produce an integrated view of the dynamics of the populations.

The U.S. GLOBEC Georges Bank Executive Committee (EXCO) provides program leadership and effective communication with the funding agencies.

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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
National Science Foundation (NSF)	unknown GB NSF
National Oceanic and Atmospheric Administration (NOAA)	unknown GB NOAA

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