# Broadscale physical and nutrient kriged data, five year summary from R/V Endeavor, R/V Albatross IV, R/V Oceanus in the Gulf of Maine and Georges Bank, WHOI from 1995-2004 (GB project)

**Website**: https://www.bco-dmo.org/dataset/2297
**Version**: 1
**Version Date**: 2010-03-12

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

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

| Contributors | Affiliation | Role |
|---|---|---|
| Mountain, David | National Oceanic and Atmospheric Administration (NOAA) | Principal Investigator |
| Townsend, David W. | University of Miami | Principal Investigator |
| Copley, Nancy | Woods Hole Oceanographic Institution (WHOI) | Technician, BCO-DMO Data Manager |
| Taylor, Maureen | National Oceanic and Atmospheric Administration (NOAA) | Technician |

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## Coverage

**Spatial Extent**: **N**:42.5 **E**:-65.5 **S**:40 **W**:-70.5
**Temporal Extent**: 1995 - 2004

## Dataset Description

Modeling study performed at WHOI using Broadscale cruise data. Thumbnail images of the broad-scale data, processed using kriging techniques, are displayed here. Clicking on the thumbnail image will open a new browser window displaying the original, large image. Matlab data files are also accessible on these pages by clicking on the appropriate link. Matlab data files are of kriged values for Georges Bank with 2385 grid points. Note that on some browsers it will be necessary to hold down the "shift key" before clicking on the link in order to download the data to a file. Otherwise the data are loaded into your browser. Unless your browser knows what to do with Matlab binary data, it is best to download the whole file.

Thumbnail images were created from the original Matlab generated images using the mogrify utility in a single batch operation prior to serving. The thumbnail image page, however, is created each time it is viewed so that the most recent images are incorporated in the served data.

These maps were created using EasyKrig 3.0 (D. Chu, WHOI, 2004, http://globec.whoi.edu/software/kriging/easy_krig/easy_krig.html) by Nancy Copley, WHOI. All data were treated anisotropically, i.e., the variable of interest changes more rapidly in one direction than in another, essentially stretching the effect. In this case the x:y ratio was 2:1 and the rotation was 45 degrees for alignment with the Bank. These parameters were chosen based upon known circulation and geography of Georges Bank. When plotting the station locations as circles on the maps, only those stations containing data are shown. Some datasets are quite sparse, e.g. ammonia at 50-100m.

**Nutrients:** nitrates & nitrites (NO3/NO2), ammonia (NH4), silica (SiOH4), phosphates (PO4) (Townsend et al, U. Maine):
Data are available for 1997-1999, for January through June except:
1997: no January or June data
1998: no January data

The same colorbar range was used for the nutrient maps (nitrates/nitrites, ammonia, phosphates, silicates) as D. Townsend used in his plots, located on the GLOBEC website at:
http://globec.whoi.edu/jg/info/globec/gb/nut_phyto%7Bdir=globec.whoi.edu/jg/dir/globec/gb/,data=grampus.umeoce.maine.edu/jg/serv/globec/nut_phyto.html0%7D?

Chlorophyll-a values for 1995-1996 (February through July 1995 and January through June 1996) are from the ctd_hydrography; the 1997-1999 data are from D. Townsend's nutrient data. The color range is given as both 0-6 and 0-10 in order to make both large and small scale variations more clearly visible.

Nutrient and chl-a data were averaged from 3 depth strata: 0-15m, 15-50m, and 50-100m. There were usually one or two bottle samples in each range.

Biovolume data from bongo net displacement volumes is from D. Mountain, Jack Green and Joe Kane,
NMFS:http://globec.whoi.edu/jg/serv/globec/gb/broadscale/bongovols.html0%7Bdir=globec.whoi.edu/jg/dir/globec/gb/broadscale/,info=globec.whoi.edu/jg/info/globec/gb/broadscale/bon

Temperature, fluorometry, salinity and density stratification values were kriged from data provided by D. Mountain at http://globec.whoi.edu/jg/dir/globec/gb/broadscale/ under ctd_hydrography.

The density stratification was calculated by first finding the density of each station and depth for which there was a temperature and salinity using a Matlab mfile function called sw_dens.m. Then the mean density was calculated for the depth strata 0-15 meters and for 50-100 m. If the maximum depth of a station was less than 50 m, the mean of 25-50m was used as the deep value. The difference is the stratification index.

### Methods & Sampling

See cruise reports for information on original data used to create the kriged maps.

NOTE: There appears to be a decrease in the sensitivity of the fluorometer beginning in June 1997 (It may have begun earlier but the data is too variable to tell).
It appeared to remain about the same until January of 1999 where it declined again and became only about 1/3 - 1/4 the sensitivity of what it was in 95 and 96.
There does not appear to be a further change during 1999 although again it is hard to tell. (E.D.,8/05)

### Data Processing Description

**VARIABLE STRUCTURE**

There are two structures: "para" and "data", where structure "para" contains all parameters including "load data", "variogram", "kriging", and "display", and structure "data" contains the input ("in")and output data ("out") structures.

1. PARAMETERS

| VARIABLE NAME | | | DESCRIPTION |
|---|---|---|---|
| para | | | Parameters Structure |
| | .home_dir | | home directory |
| | .optim | | flag of optimization tool box |
| | .dataprep | | Data Preparation parameters |
| | | .filename | input filename |
| | | .fileID | File ID for the data set |
| | | .x_norm | normalization factor for variable 1 |
| | | .y_norm | normalization factor for variable 2 |
| | | .z_norm | normalization factor for variable 3 |
| | | .x_offset | coordinate offset for variable 1 |
| | | .y_offset | coordinate offset for variable 2 |
| | | .z_offset | coordinate offset for variable 3 |
| | | .latlonfac | conversion factor between longitude/latitude (deg) and x/y (length) |
| | | .reduct_fac | data reduction factor |
| | | .filter_type | filter type |
| | | .filter_supt | filter support |
| | | .transform_index | index of data transformation model |
| | .vario | | (Semi-)Variogram/Correlogram parameters |
| | | .model | model index of variogram/correlogram |
| | | .sill | sill |
| | | .lscl | relative length scale |
| | | .nugt | nugget |
| | | .powr | power |
| | | .hole | scale of hole effect |
| | | .range | range of modeling |
| | | .res | resolution of the lag |
| | | .angle | anisotrophy angle |
| | | .ratio | anisotrophy aspect ratio |
| | | .ang_res | angle resolution of 2D variogram/correlogram |
| | | .para_file | parameter filename |
| | .krig | | Kriging parameters |
| | | .xmin | minimum x-coordinate |
| | | .xmax | maximum x-coordinate |
| | | .dx | resolution in x direction |
| | | .ymin | minimum y-coordinate |
| | | .ymax | maximum y-coordinate |
| | | .dy | resolution in y direction |
| | | .zmin | minimum z-coordinate |
| | | .zmax | maximum z-coordinate |
| | | .dz | resolution in z direction |
| | | .model | kriging model index |
| | | .scheme | kriging scheme index |
| | | .blk_nx | horizontal block size (only for point-block kriging) |
| | | .blk_ny | vertical block size (only for point-block kriging) |
| | | .srad | kriging search radius |
| | | .kmin | minimum kriging points |
| | | .kmax | maximum kriging points |
| | | .elim | relative error limit |
| | | .batch_file_proc | flag for batch file processing |
| | | .batch_data_file | file that contains a list of input data filename(s) for batch processing |
| | | .grid_file | filepath and filename of the customized grid file |

2. OUTPUT AND INPUT DATA

| VARIABLE NAME | DESCRIPTION |
|---|---|
| data | Data Structure |
| .in | Input data |
| .dim | dimension of the input data |
| .var1 | x-coordinates of raw data after duplicated data and nan's removed |
| .var2 | y-coordinates of raw data after duplicated data and nan's removed |
| .var3 | z-coordinates of raw data after duplicated data and nan's removed |
| .var | raw data after duplicated data and nan's removed |
| .x | x - coordinates after initial manipulation (reduction, normalization) |
| .y | y - coordinates after initial manipulation (reduction, normalization) |
| .z | z - coordinates after initial manipulation (reduction, normalization) |
| .v | data after initial data processing (reduction) |
| .tvar | transformed data from data.in.var. |
| .tv | transformed data from data.in.v |
| .out | Output data |
| .vario | Data output from semi-variogram/correlogram computation |
| .c0 | variance |
| .lag | lag of semi-variogram (correlogram) |
| .gammah | semi-variogram |
| .cnt | count of data pairs at each lag |
| .ang | angle array for 2D semi-variogram/correlogram |
| .x | x-axis of 2D semi-variogram/correlogram |
| .y | y-axis of 2D semi-variogram/correlogram |
| .lag_theo | lag used in model-based variogram/correlogram |
| .gammah_theo | model-based semi-variogram |
| .gammah2d | 2D semi-variogram |
| .krig | Data output from kriging |
| .nx | output data dimension: nx * ny for 2D and nx * ny * nz for 3D |
| .ny | output data dimension: nx * ny for 2D and nx * ny * nz for 3D |
| .nz | output data dimension: nx * ny * nz for 3D |
| .xg | normalized grided x-coordinate |
| .yg | normalized grided y-coordinate |
| .zg | normalized grided z-coordinate |
| .gx | normalized grided x-coordinates for customized grids |
| .gy | normalized grided y-coordinates for customized grids |
| .gz | normalized grided z-coordinates for customized grids |
| .Xg | 2D/3D x-coordinate matrix |
| .Yg | 2D/3D x-coordinate matrix |
| .Zg | 2D/3D x-coordinate matrix |
| .Vg | 2D/3D data from kriging at (Xg, Yg) |
| .Eg | 2D/3D kriging variance at (Xg,Yg) |
| .lg | reshaped 1D representation of the 2D/3D variable Cg |
| .eg | reshaped 1D representation of the 2D/3D variable Eg |
| .gv | kriging results at the customized grids (gx, gy, gz) |
| .ge | kriging variance at the customized grids (gx, gy, gz) |
| .ls | predicted observed data from Double Kriging cross-validation |
| .ljk | predicted observed data from leave-one-out cross-validation |
| .ek | normalized residual array in Q1 and Q2 cross-validations |
| .q1 | value of Q1 cross validation |
| .q2 | value of Q2 cross validation |

3. Example
To plot the kriging map using your own program, load the output file saved
from easy_krig3.0 and then type:

```
>>pcolor(data.out.krig.Xg,data.out.krig.Yg,data.out.krig.Cg);
>>colorbar;shading interp
```

to plot a kriging image, or

```
>>pcolor(data.out.krig.Xg,data.out.krig.Yg,data.out.krig.Eg);
>>colorbar;shading interp
```

to plot the kriging variance image. The structured variable "data.out.krig.Xg" means "out" is a substructure under "data", "krig" is a substructure of "out", and "Xg" is a member (2d array) of the substructure "krig". All substructures and members of the primary structures "data" and "para" are listed and explained above (note that only part of those parameters may be useful to the users).

*Last modified: May 18, 2005*

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## Data Files

| File |
|---|
| **broadscale_summary.csv** (Comma Separated Values (.csv), 8.07 KB)<br>MD5:d5bc8844992d0e666b5d5973736dc022<br><br>Primary data file for dataset ID 2297 |

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## Parameters

| Parameter | Description | Units |
|---|---|---|
| biovol | Bongo net displacement volume | cc/m2 |
| chl_a | Chlorophyll-a pigment | milligrams per meter cubed (mg/m3) or micrograms per liter (g/l) |
| density | Density stratification index | density of deep (25-50m) minus density of shallow (0-15m) |
| flvolt | Fluorometer voltage measurement | volts |
| NH4 | Ammonium | microM (micromolar) or g-at NH3-N/l |
| NO3_NO2 | Nitrate and Nitrite | microM (micromolar) or microgram-at NO3-N and NO2-N/l |
| PO4 | Orthophosphate | microM (micromolar) or g-at PO4-P/l |
| sal | Salinity | practical salinity units |
| SiOH_4 | Orthosilicic Acid | Si(OH)4 microM(micromolar) or g-at Si(OH)4-Si/l |
| temp | Temperature | degrees Centigrade |
| press | Pressure | decibars |

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## Instruments

| | |
|---|---|
| **Dataset-specific Instrument Name** | CTD profiler |
| **Generic Instrument Name** | CTD - profiler |
| **Generic Instrument Description** | The Conductivity, Temperature, Depth (CTD) unit is an integrated instrument package designed to measure the conductivity, temperature, and pressure (depth) of the water column. The instrument is lowered via cable through the water column. It permits scientists to observe the physical properties in real-time via a conducting cable, which is typically connected to a CTD to a deck unit and computer on a ship. The CTD is often configured with additional optional sensors including fluorometers, transmissometers and/or radiometers. It is often combined with a Rosette of water sampling bottles (e.g. Niskin, GO-FLO) for collecting discrete water samples during the cast. This term applies to profiling CTDs. For fixed CTDs, see https://www.bco-dmo.org/instrument/869934. |

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## Deployments

**EN276**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57413 |
| **Platform** | R/V Endeavor |
| **Report** | http://globec.whoi.edu/globec-dir/reports/en276/EN276.pdf |
| **Start Date** | 1996-01-10 |
| **End Date** | 1996-01-22 |
| **Description** | broad-scale |

**lab_WHOI_broadscale_summary**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/58040 |
| **Platform** | WHOI |
| **Start Date** | 2004-10-01 |
| **End Date** | 2004-12-31 |
| **Description** | kriged maps from Broadscale cruise data were created using kriging software created by D. Chu.<br><br>**Methods & Sampling**<br>Modeling study performed at WHOI using Broadscale cruise data |

**EN261**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57401 |
| **Platform** | R/V Endeavor |
| **Start Date** | 1995-02-10 |
| **End Date** | 1995-02-20 |
| **Description** | broad-scale |

**EN263**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57403 |
| **Platform** | R/V Endeavor |
| **Report** | http://globec.whoi.edu/globec-dir/reports/en263/EN263.pdf |
| **Start Date** | 1995-03-13 |
| **End Date** | 1995-03-24 |
| **Description** | broad-scale |

**EN265**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57405 |
| **Platform** | R/V Endeavor |
| **Start Date** | 1995-04-11 |
| **End Date** | 1995-04-22 |
| **Description** | broad-scale |

**AL9505**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57371 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9505/al9505rot.pdf |
| **Start Date** | 1995-05-09 |
| **End Date** | 1995-05-18 |
| **Description** | broad-scale |

**AL9506**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57372 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9506/al9506new.html |
| **Start Date** | 1995-06-05 |
| **End Date** | 1995-06-15 |
| **Description** | broad-scale |

**AL9508**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57373 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9508/a9508rp2.HTM |
| **Start Date** | 1995-07-10 |
| **End Date** | 1995-07-20 |
| **Description** | broad-scale |

**EN278**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57414 |
| **Platform** | R/V Endeavor |
| **Start Date** | 1996-02-13 |
| **End Date** | 1996-02-25 |
| **Description** | broad-scale |

**EN282**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57415 |
| **Platform** | R/V Endeavor |
| **Start Date** | 1996-04-08 |
| **End Date** | 1996-04-20 |
| **Description** | broad-scale |

**AL9607**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57376 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9607/AL9607.pdf |
| **Start Date** | 1996-06-03 |
| **End Date** | 1996-06-13 |
| **Description** | broad-scale |

**AL9605**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57375 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9605/al9605.html |
| **Start Date** | 1996-05-06 |
| **End Date** | 1996-05-17 |
| **Description** | broad-scale |

**AL9701**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57378 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9701/cral9701.htm |
| **Start Date** | 1997-01-13 |
| **End Date** | 1997-01-20 |
| **Description** | broad-scale |

**OC317**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57451 |
| **Platform** | R/V Oceanus |
| **Start Date** | 1998-02-06 |
| **End Date** | 1998-02-19 |
| **Description** | broad-scale |

**EN319**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57426 |
| **Platform** | R/V Endeavor |
| **Report** | http://globec.whoi.edu/globec-dir/reports/en319/en319rept.html |
| **Start Date** | 1999-02-21 |
| **End Date** | 1999-03-04 |
| **Description** | process zooplankton vital rates |

**OC322**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57454 |
| **Platform** | R/V Oceanus |
| **Report** | http://globec.whoi.edu/globec-dir/reports/oc322/oc322.html |
| **Start Date** | 1998-04-15 |
| **End Date** | 1998-04-27 |
| **Description** | broad-scale |

**AL9806**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57384 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9806/al9806.html |
| **Start Date** | 1998-05-13 |
| **End Date** | 1998-05-22 |
| **Description** | broad-scale |

**AL9808**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57385 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9808/al9808.html |
| **Start Date** | 1998-06-16 |
| **End Date** | 1998-06-26 |
| **Description** | broad-scale |

**AL9901**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57386 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9901/al9901.html |
| **Start Date** | 1999-01-12 |
| **End Date** | 1999-01-24 |
| **Description** | broad-scale |

**OC336**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57459 |
| **Platform** | R/V Oceanus |
| **Report** | http://globec.whoi.edu/globec-dir/reports/oc336/oc336cruise-report.html |
| **Start Date** | 1999-02-11 |
| **End Date** | 1999-02-23 |
| **Description** | broad-scale |

**EN320**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57427 |
| **Platform** | R/V Endeavor |
| **Report** | http://globec.whoi.edu/globec-dir/reports/en320new/en320mda.htm |
| **Start Date** | 1999-03-10 |
| **End Date** | 1999-03-23 |
| **Description** | broad-scale |

**OC341**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57464 |
| **Platform** | R/V Oceanus |
| **Report** | http://globec.whoi.edu/globec-dir/reports/oc341/reptoc341.html |
| **Start Date** | 1999-04-16 |
| **End Date** | 1999-04-27 |
| **Description** | broad-scale |

**AL9904**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57387 |
| **Platform** | R/V Albatross IV |
| **Start Date** | 1999-05-19 |
| **End Date** | 1999-05-27 |
| **Description** | broad-scale |

**AL9906**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57388 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9906/al9906rpt.html |
| **Start Date** | 1999-06-14 |
| **End Date** | 1999-06-24 |
| **Description** | broad-scale |

**OC298**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57444 |
| **Platform** | R/V Oceanus |
| **Report** | http://globec.whoi.edu/globec-dir/reports/oc298/cruisereport.html |
| **Start Date** | 1997-02-11 |
| **End Date** | 1997-02-23 |
| **Description** | broad-scale |

**OC300**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57446 |
| **Platform** | R/V Oceanus |
| **Report** | http://globec.whoi.edu/globec-dir/reports/oc300/oc300rpt.mr7.html |
| **Start Date** | 1997-03-16 |
| **End Date** | 1997-03-28 |
| **Description** | broad-scale |

**OC302**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57448 |
| **Platform** | R/V Oceanus |
| **Report** | http://globec.whoi.edu/globec-dir/reports/oc302/oce302.html |
| **Start Date** | 1997-04-22 |
| **End Date** | 1997-05-02 |
| **Description** | broad-scale |

**AL9705**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57379 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9705/al9705.html |
| **Start Date** | 1997-05-19 |
| **End Date** | 1997-05-27 |
| **Description** | broad-scale |

**AL9707**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57380 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9707/al9707.html |
| **Start Date** | 1997-06-18 |
| **End Date** | 1997-06-28 |
| **Description** | broad-scale |

**AL9801**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57382 |
| **Platform** | R/V Albatross IV |
| **Report** | http://globec.whoi.edu/globec-dir/reports/al9801/al9801.html |
| **Start Date** | 1998-01-07 |
| **End Date** | 1998-01-19 |
| **Description** | broad-scale |

**OC275**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/57440 |
| **Platform** | R/V Oceanus |
| **Start Date** | 1996-03-11 |
| **End Date** | 1996-03-22 |
| **Description** | broad-scale |

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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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