Georges Bank Northeast Peak ADCP mooring data from GB NEP Mooring NEP_buoy_dep3.1 in the Georges Bank, Northeast Peak from 1996 (GB project)

Website: https://www.bco-dmo.org/dataset/3277
Version: 2009-12-08

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

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

Contributors	Affiliation	Role
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Dataset Description

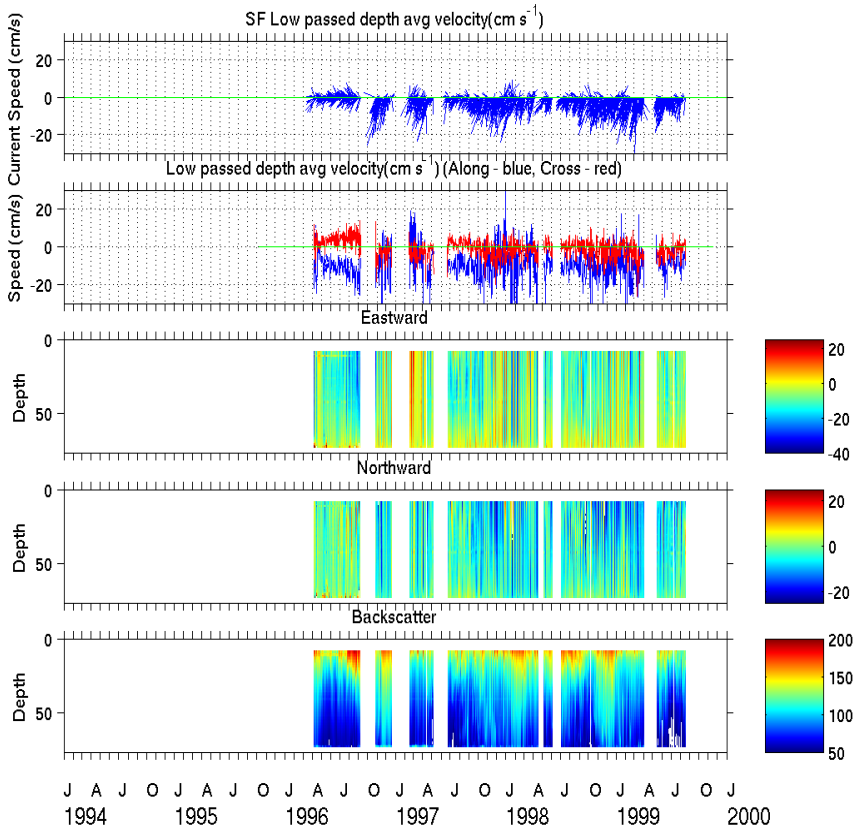
"As part of the U.S. GLOBEC Northwest Atlantic/Georges Bank program, moorings were deployed on Georges Bank as part of the broad-scale survey component to help measure the temporal variability of both physical and biological characteristics on the Bank. The array consisted of a primary mooring site on the Southern Flank which was maintained for the full 5-year duration of the field program, plus secondary moorings, with fewer sensors and of shorter duration, in the well-mixed water on the Crest and in the cod/haddock spawning region on the Northeast Peak. Temperature and conductivity (salinity) were measured at 5-m intervals, ADCP velocity profiles were obtained with 1-m vertical resolution, and bio-optical packages (measuring fluorescence, optical transmission and photosynthetically active radiation) were deployed at 10-m and 40-m depths. Bottom pressure was measured at the Southern Flank site. The buoy design, sensors and mooring configuration is presented and discussed below, and the data obtained is presented and discussed in an accompanying report "U.S. GLOBEC Georges Bank Long-Term Moored Program: Data Report." (December 2005 WHOI-2005-11; "*U.S. GLOBEC Georges Bank Long-Term Moored Program: Part 1 - Mooring Configuration*" by J.D. Irish, S. Kerry, P. Fucile, R.C. Beardsley, J. Lord, and Ken Brink.)

"Long-term moorings were deployed on Georges Bank from the fall of 1994 through the summer of 1999. The Southern Flank site was occupied all years, the Crest just the first and the Northeast Peak the second, fourth and fifth years. Not all depths were occupied by all sensors at all times." (DRAFT REPORT - 27 April 2005, WHOI-2005-XX, "*U.S. GLOBEC Georges Bank Long-Term Moored Program: Part 2 - Yearly Data Summary and Report*" J.D. Irish, R.C. Beardsley, M. Caruso, R. Limeburner, and Ken Brink)

Methods & Sampling

The ADCP pinged at as high a rate as possible with the power available in the ADCP with auxiliary battery pack - 900 pings at 4-second intervals so that the expected uncertainty in the velocity measurement was less that 0.5 cm/sec. The 1-hour (or sometimes 0.5 hour) averaged horizontal velocities were measured in 1-m vertical bins from about 8-m depth to about 10 m above bottom. The loss at the top was due to blanking to remove transducer ringing, and the loss at the bottom was due to sidelobe reflection from the direct downward path to the bottom. The amplitude of the backscattered signal was also recorded in the 1-meter bins and used to monitor the time and depth changes in backscattered signal (related to biological scatterers in the water column). The ADCP also "saw" the instrumentation along the mooring line as side-lobe reflection contamination of the records. This was not apparent in short records (1 week), but becomes obvious with 6-month long record averages. The amplitude of the backscattered signal has an increased level and the Doppler velocities decreased at the depths of the sensors. The decreased velocity estimate is because the signal reflected from the stationary sensors has zero Doppler shift and biases the velocity estimate toward zero. (December 2005 WHOI-2005-11; " *U.S. GLOBEC Georges Bank Long-Term Moored Program: Part 1 - Mooring Configuration*" by J.D. Irish, S. Kerry, P. Fucile, R.C. Beardsley, J. Lord, and Ken Brink.)

Data Processing Description



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Data Files

File
NEP_adcp_1996.csv (Comma Separated Values (.csv), 15.88 MB) MD5:b43ffb7165c383641211df09c940fe92 Primary data file for dataset ID 3277

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Parameters

Parameter	Description	Units
mooring	mooring identification	
year_start	starting year of sampling/operation, GMT	
lat	latitude, in decimal degrees, North is positive, negative denotes South	decimal degrees
lon	longitude, in decimal degrees, East is positive, negative denotes West	decimal degrees
depth_w	water depth	meters
depth	sampling depth	meters
julian_day	Julian day as a decimal, for reference: Julian day 2440000 begins at 0000 hours, May 23, 1968	
yrday_gmt	GMT day and decimal time, as 326.5 for the 326th day of the year, or November 22 at 1200 hours (noon)	
year	year, reported as YYYY, e.g. 1995	
month_gmt	month of year, GMT time , i.e. 1-12	
day_gmt	day, GMT time e.g. 22	
hour_gmt	hours of time, GMT	
minute_gmt	minutes of time, GMT	
u	eastward velocity	centimeters/second
v	northward velocity	centimeters/second
w	vertical velocity	centimeters/second

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Instruments

Dataset-specific Instrument Name	Acoustic Doppler Current Profiler
Generic Instrument Name	Acoustic Doppler Current Profiler
Dataset-specific Description	300-kHz RD Instruments Workhorse ADCP (Acoustic Doppler Current Profiler)
Generic Instrument Description	The ADCP measures water currents with sound, using a principle of sound waves called the Doppler effect. A sound wave has a higher frequency, or pitch, when it moves to you than when it moves away. You hear the Doppler effect in action when a car speeds past with a characteristic building of sound that fades when the car passes. The ADCP works by transmitting "pings" of sound at a constant frequency into the water. (The pings are so highly pitched that humans and even dolphins can't hear them.) As the sound waves travel, they ricochet off particles suspended in the moving water, and reflect back to the instrument. Due to the Doppler effect, sound waves bounced back from a particle moving away from the profiler have a slightly lowered frequency when they return. Particles moving toward the instrument send back higher frequency waves. The difference in frequency between the waves the profiler sends out and the waves it receives is called the Doppler shift. The instrument uses this shift to calculate how fast the particle and the water around it are moving. Sound waves that hit particles far from the profiler take longer to come back than waves that strike close by. By measuring the time it takes for the waves to bounce back and the Doppler shift, the profiler can measure current speed at many different depths with each series of pings. (More from WHOI instruments listing).

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Deployments

NEP_buoy_dep3.1

Website	https://www.bco-dmo.org/deployment/58023
Platform	GB NEP Mooring
Report	http://globec.whoi.edu/globec-dir/data_doc/WHOI-2005-11.pdf
Start Date	1996-10-27
End Date	1996-12-19
Description	U.S. GLOBEC Georges Bank Long-Term Moored Program

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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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