

# Video Plankton Recorder (VPR) raw data file collection from R/V Oceanus OC404-01, OC404-04, OC415-01, OC415-03 in the Sargasso Sea, 2004-2005 (EDDIES project)

Website: <https://www.bco-dmo.org/dataset/3033>

Version: 25 October 2007

Version Date: 2007-10-25

## Project

» [Eddies Dynamics, Mixing, Export, and Species composition](#) (EDDIES)

## Program

» [Ocean Carbon and Biogeochemistry](#) (OCB)

| Contributors                            | Affiliation   | Role                      |
|---|---|---------------------------|
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## Dataset Description

### EDDIES OC404 and OC415 cruises VPR raw data files

#### PI: Cabell Davis (WHOI)

25 October 2007: Prepared for OCB data system by Cyndy Chandler, BCO-DMO (MCG Dept, WHOI).

## Video Plankton Recorder (VPR) Raw Data File Collection

The WHOI Ocean Instruments Web site has a [general description of the VPR](#).

The VPR data files have not been processed yet for the EDDIES cruises. A complete set of raw data files for each cruise is available from the links below. There are two links for each cruise: (1) a .tar.gz (UNIX compressed file archive) and (2) a text file listing the files in each compressed archive.

Each OC404 (2 cruises in 2004) VPR file set includes these subdirectories:

nnpair/  
processed/  
rois/

and these zipped file archives:

Autoid.zip  
calibration.zip  
Nnpar.zip  
tefeature.zip  
Trrois.zip  
Vprlog.zip

Each OC415 (2 cruises in 2005) VPR file set includes:

a VPRstartup\_readme.txt file

and these subdirectories:

calibration  
 processed  
 rois  
 trois  
 vprlog

## The raw VPR data file collection organized by cruise

The VPR files for each cruise are packaged into several tar files to keep the size of the individual tar archives below the 2 GB maximum for the data server.

| Cruise ID                                   | Listing of Files in Compressed tar   | Compressed tar of VPR Data Files  |
|---|--|---|
| OC404-1 2004 Survey 1<br>Total size: 16 GB  | <a href="#">part 1 listing (&lt; 1 MB)</a><br><a href="#">part 2 listing (&lt; 1 MB)</a><br><a href="#">part 3 listing (&lt; 1 MB)</a><br><a href="#">part 3B listing (&lt; 1 MB)</a><br><a href="#">part 4 listing (&lt; 1 MB)</a><br><a href="#">part 4B listing (&lt; 1 MB)</a><br><a href="#">part 5 listing (&lt; 1 MB)</a><br><a href="#">part 5B listing (&lt; 1 MB)</a><br><a href="#">part 6 listing (&lt; 1 MB)</a><br><a href="#">part 6B listing (&lt; 1 MB)</a><br><a href="#">part 7 listing (&lt; 1 MB)</a><br><a href="#">part 8 listing (&lt; 1 MB)</a> | <a href="#">data part 1</a> (1.0 GB)<br><a href="#">data part 2</a> (1.6 GB)<br><a href="#">data part 3</a> (1.0 GB)<br><a href="#">data part 3B</a> (1.4 GB)<br><a href="#">data part 4</a> (2.0 GB)<br><a href="#">data part 4B</a> (.8 GB)<br><a href="#">data part 5</a> (.7 GB)<br><a href="#">data part 5B</a> (1.4 GB)<br><a href="#">data part 6</a> (.7 GB)<br><a href="#">data part 6B</a> (1.9 GB)<br><a href="#">data part 7</a> (1.9 GB)<br><a href="#">data part 8</a> (1.8 GB) |
| OC404-4 2004 Survey 2<br>Total size: 4.1 GB | <a href="#">part 1 listing (&lt; 1 MB)</a><br><a href="#">part 2 listing (&lt; 1 MB)</a><br><a href="#">part 3 listing (2 MB)</a>  | <a href="#">data part 1</a> (291 MB)<br><a href="#">data part 2</a> (1.7 GB)<br><a href="#">data part 3</a> (1.6 GB)  |
| OC415-1 2005 Survey 1<br>Total size: 6.2 GB | <a href="#">part 1 listing (15 MB)</a><br><a href="#">part 2 listing (7 MB)</a><br><a href="#">part 3 listing (7 MB)</a>   | <a href="#">data part 1</a> (1.6 GB)<br><a href="#">data part 2</a> (763 MB)<br><a href="#">data part 3</a> (748 MB)  |
| OC415-3 2005 Survey 2<br>Total size: 3.4 GB | <a href="#">archive listing (15 MB)</a>  | <a href="#">data files</a> (1.6 GB all in one archive)  |

**Hint:** To work with the raw files files, make a separate subdirectory for the cruise and download the compressed data file tar files to that cruise subdirectory. Then decompress and unpack only the .tar.gz files for that cruise into that cruise subdirectory. For example, to work with the VPR data files from OC415-1, the 2005 Survey 1 cruise, on a linux system:

1. mkdir OC415-1; cd OC415-1
2. download all the 3 .tar.gz files for cruise OC415-1 . . .
3. gunzip oc415\_1.raw\_part1.tar.gz
4. tar -xvf oc415\_1.raw\_part1.tar
5. repeat for each oc415\_1.raw\_part\*.tar file

After all the OC415-1 tar files are unpacked, they will require about 3.4 GB of disk space (the Total size noted in column 1), and you should have a collection of subdirectories similar to those listed above for OC415 VPR file set.

### Contact:

Anyone trying to use these raw VPR files is encouraged to contact either Dennis McGillicuddy or Cabell Davis with any questions.

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## Parameters

*Parameters for this dataset have not yet been identified*

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## Instruments

|   |  |
|---|--|
| <b>Dataset-specific Instrument Name</b> | Video Plankton Recorder  |
| <b>Generic Instrument Name</b>          | Video Plankton Recorder  |
| <b>Generic Instrument Description</b>   | <p>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.</p> |

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## Deployments

### OC404-01

|                    |   |
|--------------------|---|
| <b>Website</b>     | <a href="https://www.bco-dmo.org/deployment/57956">https://www.bco-dmo.org/deployment/57956</a>   |
| <b>Platform</b>    | R/V Oceanus   |
| <b>Report</b>      | <a href="http://ocb.whoi.edu/EDDIES/CRUISES/2004/OC404-1_Draft_Cruise_Report.pdf">http://ocb.whoi.edu/EDDIES/CRUISES/2004/OC404-1_Draft_Cruise_Report.pdf</a> |
| <b>Start Date</b>  | 2004-06-11  |
| <b>End Date</b>    | 2004-07-03  |
| <b>Description</b> | EDDIES 2004 Survey 1 cruise Funded by: NSF OCE-0241310 Original cruise data are available from the NSF R2R data catalog (Cruise DOI: 10.7284/900337)          |

### OC404-04

|                    |   |
|--------------------|---|
| <b>Website</b>     | <a href="https://www.bco-dmo.org/deployment/57961">https://www.bco-dmo.org/deployment/57961</a>   |
| <b>Platform</b>    | R/V Oceanus   |
| <b>Report</b>      | <a href="http://ocb.whoi.edu/EDDIES/CRUISES/2004/OC404-4_Draft_Cruise_Report.pdf">http://ocb.whoi.edu/EDDIES/CRUISES/2004/OC404-4_Draft_Cruise_Report.pdf</a> |
| <b>Start Date</b>  | 2004-07-25  |
| <b>End Date</b>    | 2004-08-12  |
| <b>Description</b> | EDDIES project 2004 Survey 2 cruise Funded by: NSF OCE-0241310 Original cruise data are available from the NSF R2R data catalog                               |

### OC415-01

|                    |   |
|--------------------|---|
| <b>Website</b>     | <a href="https://www.bco-dmo.org/deployment/57962">https://www.bco-dmo.org/deployment/57962</a>   |
| <b>Platform</b>    | R/V Oceanus   |
| <b>Report</b>      | <a href="http://ocb.whoi.edu/EDDIES/CRUISES/2005/OC415_Draft_Cruise_Report_050722.pdf">http://ocb.whoi.edu/EDDIES/CRUISES/2005/OC415_Draft_Cruise_Report_050722.pdf</a> |
| <b>Start Date</b>  | 2005-06-20  |
| <b>End Date</b>    | 2005-07-15  |
| <b>Description</b> | EDDIES project 2005 Survey 1 cruise Funded by: NSF OCE-0241310 Original cruise data are available from the NSF R2R data catalog   |

### OC415-03

|                    |   |
|--------------------|---|
| <b>Website</b>     | <a href="https://www.bco-dmo.org/deployment/57965">https://www.bco-dmo.org/deployment/57965</a>   |
| <b>Platform</b>    | R/V Oceanus   |
| <b>Report</b>      | <a href="http://ocb.whoi.edu/EDDIES/CRUISES/2005/OC415-3_CrRptDraft_091405.pdf">http://ocb.whoi.edu/EDDIES/CRUISES/2005/OC415-3_CrRptDraft_091405.pdf</a> |
| <b>Start Date</b>  | 2005-08-07  |
| <b>End Date</b>    | 2005-08-26  |
| <b>Description</b> | EDDIES project 2005 Survey 2 cruise Funded by: NSF OCE-0241310 Original cruise data are available from the NSF R2R data catalog                           |

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## Project Information

## **Eddies Dynamics, Mixing, Export, and Species composition (EDDIES)**

**Website:** [http://science.whoi.edu/users/olga/eddies/EDDIES\\_Project.html](http://science.whoi.edu/users/olga/eddies/EDDIES_Project.html)

**Coverage:** Sargasso Sea

The original title of this project from the NSF award is: Collaborative Research: Impacts of Eddies and Mixing on Plankton Community Structure and Biogeochemical Cycling in the Sargasso Sea".

Prior results have documented eddy-driven transport of nutrients into the euphotic zone and the associated accumulation of chlorophyll. However, several key aspects of mesoscale upwelling events remain unresolved by the extant database, including: (1) phytoplankton physiological response, (2) changes in community structure, (3) impact on export out of the euphotic zone, (4) rates of mixing between the surface mixed layer and the base of the euphotic zone, and (5) implications for biogeochemistry and differential cycling of carbon and associated bioactive elements. This leads to the following hypotheses concerning the complex, non-linear biological regulation of elemental cycling in the ocean:

H1: Eddy-induced upwelling, in combination with diapycnal mixing in the upper ocean, introduces new nutrients into the euphotic zone.

H2: The increase in inorganic nutrients stimulates a physiological response within the phytoplankton community.

H3: Differing physiological responses of the various species bring about a shift in community structure.

H4: Changes in community structure lead to increases in export from, and changes in biogeochemical cycling within, the upper ocean.

### **Publications**

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## **Program Information**

### **Ocean Carbon and Biogeochemistry (OCB)**

**Website:** <http://us-ocb.org/>

**Coverage:** Global

The Ocean Carbon and Biogeochemistry (OCB) program focuses on the ocean's role as a component of the global Earth system, bringing together research in geochemistry, ocean physics, and ecology that inform on and advance our understanding of ocean biogeochemistry. The overall program goals are to promote, plan, and coordinate collaborative, multidisciplinary research opportunities within the U.S. research community and with international partners. Important OCB-related activities currently include: the Ocean Carbon and Climate Change (OCCC) and the North American Carbon Program (NACP); U.S. contributions to IMBER, SOLAS, CARBOOCEAN; and numerous U.S. single-investigator and medium-size research projects funded by U.S. federal agencies including NASA, NOAA, and NSF.

The scientific mission of OCB is to study the evolving role of the ocean in the global carbon cycle, in the face of environmental variability and change through studies of marine biogeochemical cycles and associated ecosystems.

The overarching OCB science themes include improved understanding and prediction of: 1) oceanic uptake and release of atmospheric CO<sub>2</sub> and other greenhouse gases and 2) environmental sensitivities of biogeochemical cycles, marine ecosystems, and interactions between the two.

The OCB Research Priorities (updated January 2012) include: ocean acidification; terrestrial/coastal carbon fluxes and exchanges; climate sensitivities of and change in ecosystem structure and associated impacts on biogeochemical cycles; mesopelagic ecological and biogeochemical interactions; benthic-pelagic feedbacks on biogeochemical cycles; ocean carbon uptake and storage; and expanding low-oxygen conditions in the coastal and open oceans.

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