Jellyfish Database Initiative: Global records on gelatinous zooplankton for the past 200 years, collected from global sources and literature (Trophic BATS project)

Website: https://www.bco-dmo.org/dataset/526852
Version: 2014-08-28

Project
» Plankton Community Composition and Trophic Interactions as Modifiers of Carbon Export in the Sargasso Sea (Trophic BATS)

Program
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
Condon, Robert	University of North Carolina - Wilmington (UNC-Wilmington)	Principal Investigator
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Abstract
The Jellyfish Database Initiative (JeDI) is a scientifically-coordinated global database dedicated to gelatinous zooplankton (members of the Cnidaria, Ctenophora and Thaliacea) and associated environmental data. The database holds 476,000 quantitative, categorical, presence-absence and presence only records of gelatinous zooplankton spanning the past four centuries (1790-2011) assembled from a variety of published and unpublished sources. Gelatinous zooplankton data are reported to species level, where identified, but taxonomic information on phylum, family and order are reported for all records. Other auxiliary metadata, such as physical, environmental and biometric information relating to the gelatinous zooplankton metadata, are included with each respective entry. JeDI has been developed and designed as an open access research tool for the scientific community to quantitatively define the global baseline of gelatinous zooplankton populations and to describe long-term and large-scale trends in gelatinous zooplankton populations and blooms. It has also been constructed as a future repository of datasets, thus allowing retrospective analyses of the baseline and trends in global gelatinous zooplankton populations to be conducted in the future.

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Dataset Description

The Jellyfish Database Initiative (JeDI) is a scientifically-coordinated global database dedicated to gelatinous zooplankton (members of the Cnidaria, Ctenophora and Thaliacea) and associated environmental data. The database holds 476,000 quantitative, categorical, presence-absence and presence only records of gelatinous zooplankton spanning the past four centuries (1790-2011) assembled from a variety of published and unpublished sources. Gelatinous zooplankton data are reported to species level, where identified, but taxonomic information on phylum, family and order are reported for all records. Other auxiliary metadata, such as physical, environmental and biometric information relating to the gelatinous zooplankton metadata, are

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References:

Lucas, C.J., et al. 2014. Gelatinous zooplankton biomass in the global oceans: geographic variation and environmental drivers. Global Ecol. Biogeogr. (DOI: 10.1111/geb.12169)

Condon, R. H., et al. 2013. Recurrent jellyfish blooms are a consequence of global oscillations. PNAS vol. 110(3) 1000-1005. www.pnas.org/cgi/doi/10.1073/pnas.1210920110)

*Condon, R. H., et al. 2012.*Questioning the Rise of Gelatinous Zooplankton in the World's Oceans. BioScience vol. 62(2) 160-169. (doi:10.1525/bio.2012.62.2.9)

Methods & Sampling

This information has been synthesized by members of the Global Jellyfish Group from online databases, unpublished and published datasets. More specific details may be found in *Lucas, C.J., et al. 2014. Gelatinous zooplankton biomass in the global oceans: geographic variation and environmental drivers. Global Ecol. Biogeogr. (DOI: 10.1111/geb.12169)* in the methods section.

Data Processing Description

BCO-DMO Processing Notes:

-Added BCO-DMO header information
NOTE:
record 476254-476255 (klr.49, physalia sp.) both have "None" as values for almost all fields.
precision varies greatly within parameters and over the time series.

Ran a script to edit the following in in all text fields:
- Output was tab-delimited file
- spaces were edited to underscores
- commas edited to semicolons
- "?" was edited to unknown
- missing data fields were edited to 'nd'.

Also edited the following:
- resolved/edited all special characters associated with foreign language/names
- Separated day from variably-formatted date and served month day and year separately.
- edited precision of density (calculated field)
- Separated compound Project names into Project and Sub-pProject names (i.e., created column 'sub-project')

-Many text fields were too large to serve online, and were therefore edited to abbreviate information, create a consistent format, and correct found errors. Original values were retained in the file: jedi_term_legend.txt

Formatting of names was highly variable/inconsistent. Therefore, the parameters 'owner_dataset' and 'contact' were edited as follows:
-Last name was put first with underscore, then first initial. If first/last names were indistinquishable, and no comma or semicolon was present, then first name in cell was considered the first name of individual and moved to just initial after the second name, assumed to be last name.
-More than three names in a cell was abbreviated to lastname_firstinitial_et_al
-Removed all puncuation (e.g., commas, semicolons, appostrophies and ampersands)
-Removed titles (e.g., Dr.)

When editing location names:
- Abbreviations were made where possible, in addition to camel case for two-word water body names.

- Commas were edited to semicolons for distinguishing between multiple location names

- As per PI, the following parameters were removed from the original file (empty fields):

Sea surface temperature, Temperature at collection depth, Temperature at maximum depth, Sea surface salinity, Salinity at collection depth, Salinity at maximum depth, Dissolved oxygen at surface, Dissolved oxygen at collection depth, Dissolved oxygen at maximum depth, Chlorophyll at surface, Chlorophyll at maximum depth, Chlorophyll at collection depth, Fluorescence at surface, Fluorescence at collection depth, Fluorescence at maximum depth, Transmissivity at surface, Transmissivity at collection depth, Transmissivity at maximum depth, pH at surface, pH at collection depth, pH at maximum depth, JEDI internal reference number, Depth integrated carbon, Depth integrated nitrogen, Depth integrated protein, Morpho metadata file ID.

- Removed all duplicate records (lines).

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Data Files

File
JeDI.csv (Comma Separated Values (.csv), 104.11 MB) MD5:89697ce63cedc2a5f0bc8fa2833a3c3c Primary data file for dataset ID 526852

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Parameters

Parameter	Description	Units
project_title	Main portion of original project name or regional description.	dimensionless
owner_dataset	Original owner of data.	dimensionless
contact	Contact details for data access or further information about dataset.	dimensionless
location_name	Description of sample region.	dimensionless
date	Date sample was collected.	variable
year	year in YYYY format	unitless
month	Month of the year	MM
day	Day of the month	DD
time_local	Local time of sampling.	HH:MM:SS

lat	Sample latitude.	Decimal degrees
lon	Sample longitude.	Decimal degrees
taxon	Taxonomic grouping.	dimensionless
rank_phylum	Taxonomic phylum name.	dimensionless
rank_class	Taxonomic class name.	dimensionless
rank_order	Taxonomic order name.	dimensionless
rank_family	Taxonomic class name.	dimensionless
rank_genus	Taxonomic genus name.	dimensionless
rank_species	Taxonomic species name.	dimensionless
data_type	Quantitative categorical presence/absence or presence only.	dimensionless
collection_method	Brief description of methodology or data synthesis.	dimensionless
net_opening	Size of collection net opening.	meter
net_mesh	Net mesh size.	millimeter
depth	Sampling depth.	meter
depth_upper	Used for determining integrated sample units.	meter
depth_lower	Used for determining integrated sample units	meter
count_actual	Raw counts from respective survey.	dimensionless
density	density	unknown
density_integrated	Depth integrated density.	unknown

biovolume	Displacement volume of sample.	milliliters/meter^3
biovolume_integrated	Depth integrated biovolume.	milliliters/meter^2
weight_wet	Sample wet weight.	grams/meter^3
weight_dry	sample dry weight.	grams/meter^3
categorical_abundance	Generic categories or descriptors of jellyfish abundance.	unknown
presence_absence	Indication of presence or absence of a targeted species, via 'present' or 'absent'.	dimensionless
study_type	Text describing type of study in which samples were obtained.	dimensionless
accompanying_ancillary_data	Indication of accompanying ancillary data via 'yes' or 'no'.	dimensionless
catch_per_effort	Fisheries unit: an indirect measure of the abundance of a target species; also known as catch rate.	kilograms per hectare
sub_project_title	Sub-project portion of original project name. If no sub-project exists, original project name was duplicated in this field.	dimensionless

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Deployments

JeDI_Condon_2014

Website	https://www.bco-dmo.org/deployment/541693
Platform	Jellyfish_Database_Initiative
Description	The Jellyfish Database Initiative (JeDI) is a scientifically-coordinated global database dedicated to gelatinous zooplankton (members of the Cnidaria, Ctenophora and Thaliacea) and associated environmental data. The database holds 476,000 quantitative, categorical, presence-absence and presence only records of gelatinous zooplankton spanning the past four centuries (1790-2011) assembled from a variety of published and unpublished sources. Gelatinous zooplankton data are reported to species level, where identified, but taxonomic information on phylum, family and order are reported for all records. Other auxiliary metadata, such as physical, environmental and biometric information relating to the gelatinous zooplankton metadata, are included with each respective entry. JeDI has been developed and designed as an open access research tool for the scientific community to quantitatively define the global baseline of gelatinous zooplankton populations and to describe long-term and large-scale trends in gelatinous zooplankton populations and blooms. It has also been constructed as a future repository of datasets, thus allowing retrospective analyses of the baseline and trends in global gelatinous zooplankton populations to be conducted in the future.

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Project Information

Plankton Community Composition and Trophic Interactions as Modifiers of Carbon Export in the Sargasso Sea (Trophic BATS)

Coverage: Sargasso Sea, BATS site

Fluxes of particulate carbon from the surface ocean are greatly influenced by the size, taxonomic composition and trophic interactions of the resident planktonic community. Large and/or heavily-ballasted phytoplankton such as diatoms and coccolithophores are key contributors to carbon export due to their high sinking rates and direct routes of export through large zooplankton. The potential contributions of small, unballasted phytoplankton, through aggregation and/or trophic re-packaging, have been recognized more recently. This recognition comes as direct observations in the field show unexpected trends. In the Sargasso Sea, for example, shallow carbon export has increased in the last decade but the corresponding shift in phytoplankton community composition during this time has not been towards larger cells like diatoms. Instead, the abundance of the picoplanktonic cyanobacterium, Synechococccus, has increased significantly. The trophic pathways that link the increased abundance of Synechococcus to carbon export have not been characterized. These observations helped to frame the overarching research question, "How do plankton size, community composition and trophic interactions modify carbon export from the euphotic zone". Since small phytoplankton are responsible for the majority of primary production in oligotrophic subtropical gyres, the trophic interactions that include them must be characterized in order to achieve a mechanistic understanding of the function of the biological pump in the oligotrophic regions of the ocean.

This requires a complete characterization of the major organisms and their rates of production and consumption. Accordingly, the research objectives are: 1) to characterize (qualitatively and quantitatively) trophic interactions between major plankton groups in the euphotic zone and rates of, and contributors to, carbon export and 2) to develop a constrained food web model, based on these data, that will allow us to better understand current and predict near-future patterns in export production in the Sargasso Sea.

The investigators will use a combination of field-based process studies and food web modeling to quantify rates of carbon exchange between key components of the ecosystem at the Bermuda Atlantic Time-series Study (BATS) site. Measurements will include a novel DNA-based approach to characterizing and quantifying planktonic contributors to carbon export. The well-documented seasonal variability at BATS and the occurrence of mesoscale eddies will be used as a natural laboratory in which to study ecosystems of different structure. This study is unique in that it aims to characterize multiple food web interactions and carbon export simultaneously and over similar time and space scales. A key strength of the proposed research is also the tight connection and feedback between the data collection and modeling components.

Characterizing the complex interactions between the biological community and export production is critical for predicting changes in phytoplankton species dominance, trophic relationships and export production that might occur under scenarios of climate-related changes in ocean circulation and mixing. The results from this research may also contribute to understanding of the biological mechanisms that drive current regional to basin scale variability in carbon export in oligotrophic gyres.

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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 research role as a component of the

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 CO2 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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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1030149

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