Sample metadata for MOCNESS tows conducted on R/V Kilo Moana cruise KM1910 at Station ALOHA during June 2019

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Project
» EAGER Collaborative Research: Early career chief scientist training for biological and chemical oceanographers (Chief Sci KM1910)

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Abstract
Metadata for samples collected by 1m2 MOCNESS on the Chief Scientist Training Cruise at station ALOHA in June 2019.

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Coverage

Spatial Extent: **N**:22.8433 **E**:-157.955 **S**:22.6879 **W**:-158.081
Temporal Extent: 2019-06 - 2019-06

Dataset Description

Data have been published "as is". Final review by the data submitter was not received after it was imported into the BCO-DMO data system.

Methods & Sampling

The zooplankton assemblage was collected using a 1m2 Multiple Opening/Closing Nets and Environmental Sampling System (MOCNESS), with all nets and cod ends at 202 µm mesh. All tows were conducted at Station ALOHA (22° 45'N 158° W) A total of 5 tows sampled the full water column between 1000 m and the sea

surface, with 3 day and 2 night paired tows. Depth strata were as follows: 0-1000m (Net 0), 1000-800 m (Net 1), 800-600m (Net 2), 600-500m (Net 3), 500-400m (Net 4), 400-300m (Net 5), 300-200m (Net 6), 200-100m (Net 7), 100-50m (Net 8), 50-0m (Net 9).

Bulk plankton from each net and tow were quantitatively split using a Folsom plankton splitter, with additional processing or preservation for several analyses. Two additional 'short' MOCNESS tows were conducted to sample the base of the mesopelagic (700-1000m) and epipelagic (0-200 m) for metatranscriptomic analyses of the zooplankton assemblage. Rapid recovery and preservation of the material was important in this case, given primary interest in gene expression profiles, and so the nets were flown as quickly as possible through midwater.

Quantitative subsamples of bulk plankton were preserved as follows:

1. Formalin-preserved – sodium tetraborate buffered formaldehyde, preserved broadly following CalCOFI protocols (https://calcofi.org/about-calcofi/calcofi-handbook/301-net-sample-preservation.html). Analyses: ZooScan, Microscopy
2. Size-fractionated into 5 or 2 fractions (0.2-0.5 mm, 0.5-1.0 mm, 1.0-2.0 mm, 2.0-5.0 mm, >5.0 mm OR 0.2-1.0 mm, >1.0 mm), filtered onto 200 µm Nitex filters, rinsed with ammonium formate, and followed by cryopreservation and storage at -80° C. Analyses: biomass, bioelements, isotopes.
3. Filtered onto 200 µm Nitex filters, followed by preservation in RNALater and storage at -80° C. Analyses: Metabarcoding.
4. Filtered onto 200 µm Nitex filters, flash frozen and stored in liquid nitrogen. Analyses: Electron Transport System (ETS) activity assay.
5. Size-fractionated into 2 fractions (0.2 - 1.0 mm, > 1.0 mm) and analyzed shipboard for alkaline phosphatase activity (APA assay)

Data Processing Description

BCO-DMO Processing:

- renamed fields to remove spaces, and problematic characters
- converted time to UTC
- converted lat lon to decimal degrees
- split size fraction column into min and max values
- split target depths column into min and max values

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Data Files

File
eager_goetze_mocness_samples_june2019-1.csv (Comma Separated Values (.csv), 50.75 KB) MD5:d9fc40c8000fb0f83eab6c5639305373 Primary data file for dataset ID 854424

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Parameters

Parameter	Description	Units
ID	Unique record idenfitier	unitless
Event_no	Event identifier	unitless

Tow_no	Tow identifier	unitless
Latitude_decimal_degrees	Latitude (degrees N)	decimal degrees
Longitude_decimal_degrees	Longitude (degrees E)	decimal degrees
Time_HST	Local time	unitless
Time_UTC	Time in UTC	unitless
Day_vs_night_tow	Time of day when a zooplankton sample was taken. "N" indicates night, and "D" indicates a daytime sample. "N short" and "D short" correspond to 2 abbreviated MOCNESS tows conducted to sample zooplankton for metatranscriptomics in the epipelagic and deep mesopelagic.	unitless
Net_no	Net identifier	unitless
Target_depths_m	Target collection depth range	meters (m)
Target_depth_min_m	Target depth minimum	meters (m)
Target_depth_max_m	Target depth maximum	meters (m)
Bulk_fraction	Bulk fraction is the quantitative subsample of the original bulk plankton from that tow/net.	unitless
Size_fraction	Size fractions as follows: NSF = not size-fractionated, 0.2-1.0mm [200 um - 1000 um], > 1.0mm [> 1000 um].	milimeters (mm)
Size_fraction_min	Size fraction minimums as follows: NSF = not size-fractionated, 0.2-1.0mm [200 um - 1000 um], > 1.0mm [> 1000 um].	milimeters (mm)
Size_fraction_max	Size fractions maximum as follows: NSF = not size-fractionated, 0.2-1.0mm [200 um - 1000 um], > 1.0mm [> 1000 um].	milimeters (mm)
Purpose_analysis	Purpose of collection and subsiquent analysis	unitless
Preservation	Preservation method applied to collected plankton	unitless

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Instruments

Dataset-specific Instrument Name	Folsom Plankton Splitter
Generic Instrument Name	Folsom Plankton Splitter
Dataset-specific Description	Bulk plankton from each net and tow were quantitatively split using a Folsom plankton splitter, with additional processing or preservation for several analyses.
Generic Instrument Description	A device for sub-sampling of plankton and ichthyoplankton samples by splitting, developed by Dr. Folsom of the Scripps Institute of Oceanography. Ideally suited for splitting plankton samples with minimal debris. A measured volume of plankton sample is placed in the undivided section of the drum. This is rotated 120 degrees to divide the stirred sample with a separating blade. Standard Methods suggests splitting until a subsample of 200-500 individuals is obtained.

Dataset-specific Instrument Name	1m2 MOCNESS
Generic Instrument Name	MOCNESS1
Dataset-specific Description	The zooplankton assemblage was collected using a 1m2 Multiple Opening/Closing Nets and Environmental Sampling System (MOCNESS), with all nets and cod ends at 202 µm mesh. All tows were conducted at Station ALOHA (22° 45’N 158° W). A total of 5 tows sampled the full water column between 1000 m and the sea surface, with 3 day and 2 night paired tows. Depth strata were as follows: 0-1000m (Net 0), 1000-800 m (Net 1), 800-600m (Net 2), 600-500m (Net 3), 500-400m (Net 4), 400-300m (Net 5), 300-200m (Net 6), 200-100m (Net 7), 100-50m (Net 8), 50-0m (Net 9).
Generic Instrument Description	The Multiple Opening/Closing Net and Environmental Sensing System or MOCNESS is a family of net systems based on the Tucker Trawl principle. The MOCNESS-1 carries nine 1-m2 nets usually of 335 micrometer mesh and is intended for use with the macrozooplankton. All nets are black to reduce contrast with the background. A motor/toggle release assembly is mounted on the top portion of the frame and stainless steel cables with swaged fittings are used to attach the net bar to the toggle release. A stepping motor in a pressure compensated case filled with oil turns the escapement crankshaft of the toggle release which sequentially releases the nets to an open then closed position on command from the surface. -- from the MOCNESS Operations Manual (1999 + 2003).

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Deployments

KM1910

Website	https://www.bco-dmo.org/deployment/841636
Platform	R/V Kilo Moana
Report	https://datadocs.bco-dmo.org/docs/305/Chief_Sci_KM1910/data_docs/matt_church_EAGER_cruise_plan_06_17_2019.pdf
Start Date	2019-06-15
End Date	2019-06-24
Description	NSF Chief Scientist Training Cruise. For more information, see Rolling Deck to Repository (R2R): https://www.rvdata.us/search/cruise/KM1910 (cruise DOI: 10.7284/908380)

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Project Information

EAGER Collaborative Research: Early career chief scientist training for biological and chemical oceanographers (Chief Sci KM1910)

Coverage: Station ALOHA (22.75N, 158W), North Pacific Ocean

NSF Award Abstract:

Intellectual Merit
The PIs request funds to provide training in leading and organizing research cruises to early career researchers in the areas of Biological and Chemical Oceanography. Participants in this training program would be introduced to pre-cruise planning and logistics, receive training in commonly used oceanographic sampling equipment, and conduct shipboard measurements during a 10-day oceanographic cruise to the North Pacific Subtropical Gyre (NPSG). The goal of this training program is to prepare early career scientists for leading and participating in interdisciplinary oceanographic research at sea.

Broader Impacts
The proposed program addresses the broader impacts criteria successfully. The research cruise and follow-up reports and publications focus on interdisciplinary questions important for advancing the field. Given the rapid changes that oceanic systems are undergoing, it is important to have a cadre of junior scientists who are adept at managing interdisciplinary collaborations and conducting research at sea. The PIs are considering ways to connect with diverse audiences in recruiting participants. The impact on early career oceanographers will be very strong. This will create an experience that will be a major impact on the careers of the trainees, especially if they stay in the oceanography field.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1911831
NSF Division of Ocean Sciences (NSF OCE)	OCE-1911990

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