

# INVESTIGATING MIXOTROPHIC ALGAL CONTRIBUTION TO COPEPOD GROWTH AND REPRODUCTION

## DATA POLICY COMPLIANCE

The project investigators will comply with the data management and dissemination policies described in the NSF Award and Administration Guide (AAG, Chapter VI.D.4) and the NSF Division of Ocean Sciences Sample and Data Policy.

## PRE-CRUISE PLANNING ADD CRUISE REPORT

Three overnight sampling trips onboard the RV Gulf Challenger are intended, and pre-trip planning will be done via video-conferencing. Descriptions of station locations, instrument deployment (drift net and CTD) and sampling events will be written up as a cruise report for each trip. The actual sampling events will be recorded on paper logs (scanned into PDF documents) and/or in a digital event log using the R2R event logger application (if available).

## DESCRIPTION OF DATA TYPES

The project will produce several observational and experimental datasets, described in the list below. In addition to the datasets described below, educational resources produced by the project, including data and images, will be made available for public use on the PI's website. Observational data will be collected on Gulf of Maine sampling trips planned to take place during April, May and July of 2022.

### Observational Datasets:

**CTD and Niskin bottle data:** CTD data collected using a SeaBird SBE CTD package; processing to be done using SeaBird's SeaSave software; data will include standard environmental measurements (such as pressure, temperature, salinity, fluorescence). File types: Raw (.con, .hdr, .hex, .bl) and processed (.cnv, .asc, .btI) ASCII files. Repository: BCO-DMO

**Event log:** Cruise scientific sampling event log; will include event numbers, start/end dates, times & locations of instrument deployments. Will be recorded using the R2R event logger (if available) and on paper log sheets. File types: Excel file converted to .csv; scanned PDFs. Repository: BCO-DMO and Rolling Deck to Repository (R2R).

**Zooplankton sampling logs and images:** Zooplankton will be sampled via net tows at 3 sites during the cruise. Photographs of each tow/trawl will be taken on the ship using a digital camera. The contents of the trawl will be preserved in ethanol for transportation back to the laboratory where individual copepods will be picked from the net tows and their guts dissected for DNA extraction and amplicon sequencing. Copepods too small for dissection will be lysed whole. Water samples will also be collected and assessed for mixotroph activity using labeled prey ingestion incubation experiments. File types: PDF files of scanned log sheets; Excel files of sampling logs; images (.jpg files). Repository: BCO-DMO.

### Experimental Datasets:

**Copepod growth and reproduction:** Feeding experiments carried out on laboratory raised copepods using different mixtures of phototrophic, heterotrophic and mixotrophic prey grown under replete and nutrient limiting conditions; dataset will include data on the observed ingestion, growth and egg production/viability, and the nutrient (carbon, nitrogen, phosphorous) and fatty acid content of the food under replete and limiting conditions. File types: Excel file(s). Repository: BCO-DMO.

**Genetic sequencing:** Ribosomal DNA amplicon sequences from guts of copepods collected at sea, seawater and labeled prey ingestion experiments. Illumina MiSeq

sequencing will be performed at the URI Genomics Facility following the extraction and amplification of samples in the PI's laboratory after the cruise. File types: Short-read archive (.sra) files. Repository: NCBI; accession numbers to be provided to BCO-DMO.

### **DATA AND METADATA FORMATS AND STANDARDS**

Field observation data will be stored in flat ASCII files, which can be read easily by different software packages. Field data will include date, time, latitude, longitude, cast number, and depth, as appropriate. Quality flags will be assigned according to the ODS IODE Quality Flag scheme (IOC Manuals and Guides, 54, volume 3; [http://www.iode.org/mg54\\_3](http://www.iode.org/mg54_3) ). Metadata will be prepared in accordance with BCO-DMO conventions (i.e. using the BCO-DMO metadata forms) and will include detailed descriptions of collection and analysis procedures. Experimental data will be stored in ASCII files (.csv; via Excel).

### **DATA STORAGE AND ACCESS DURING THE PROJECT**

The investigators will store project data (including spreadsheets, ASCII files, images, and PDFs of scanned logs) on laboratory computers that are backed up by the institution central IS organization, and by individual PI external hard drives.

### **MECHANISMS AND POLICIES FOR ACCESS, SHARING, RE-USE, AND RE-DISTRIBUTION**

DNA sequences will be deposited in the National Center for Biotechnology Information (NCBI) database GenBank upon submission of manuscripts. Data from the field sampling, along with GenBank accession numbers, will be provided to the Biological and Chemical Oceanography Data Management Office (BCO-DMO) in an Excel spreadsheet or .CSV file and metadata will be provided using the BCO-DMO Dataset Metadata submission form. Data sets produced by the science party will be made available through the BCO-DMO data system within two-years from the date of collection. The project investigators will work with BCO-DMO data managers to make project data available online in compliance with the NSF OCE Sample and Data Policy. Data, samples, and other information collected under this project can be made publically available without restriction once submitted to the public repositories. We will adhere to and promote the standards, policies, and provisions for data and metadata submission, access, re-use, distribution, and ownership as prescribed by the BCO-DMO Terms of Use (<http://www.bco-dmo.org/terms-use>).

### **PLANS FOR ARCHIVING**

BCO-DMO will also ensure that project data are submitted to the appropriate national data archive. The PI will work with BCO-DMO to ensure data are archived appropriately and that proper and complete documentation are archived along with the data.

### **ROLES AND RESPONSIBILITIES**

Each PI will be responsible for sharing data among the project participants in a timely fashion. Tarrant will be responsible for collecting and analyzing the zooplankton data, and submitting cruise data/reports. Gast will oversee the molecular biology work and will submit the resulting sequences to the National Center for Biotechnology Information's (NCBI) GenBank database. The both PIs will coordinate the overall data management and sharing process and will submit the project data, including GenBank accession numbers, and metadata to the Biological and Chemical Oceanography Data Management Office (BCO-DMO) who will be responsible for forwarding these data and metadata to the appropriate national archive.