Data Management Plan

Collaborative Research: Transgenerational phenotypic and genomic responses of marine copepods to the interactive effects of temperature and CO_2

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: Not Applicable. This research does not involve cruises.

Pre-experiments meeting: PIs from both institutions will meet early in year 1 of the proposal to coordinate experiments and sampling procedures and archival.

Description of Data Types: Data from this project are experimental and generated under controlled laboratory conditions. Independent variables are temperature and CO_2 concentrations. Dependent variables are of two type:

1) Copepod life history traits (adult egg production and egg hatching success; survival from egg to adult stages: time to adulthood; developmental rate; body length).
2) Genomic: Sequence data will include RNAseq data to quantify changes in allele frequency and gene expression and DNA methylation data to quantify methylation response to temperature and acidification (EpiRADseq). A comprehensive transcriptome assembly and a limited genome assembly.

Data and Metadata Formats and Standards: Raw data from experiments will first be recorded into laboratory notebooks, then (as rapidly as practical) transcribed verbatim into Excel spreadsheets. Data include date of experiments, experimental conditions, and values of the independent and dependent variables; e.g., independent variable: temperature (degrees Celsius) and CO_2 concentration (ppmv); dependent variables for life history traits [survival (days and % of initial numbers); egg production (eggs/female/day); hatching success: % of eggs that hatch; time to adulthood (days); developmental rate (days to stage $N_{i)}$; body size (mm)]; and dependent variables for genomics (SNP allele frequencies, epi-allele frequencies, and transcript abundance).

Data can then converted into ASCII files for distribution to other parties. Data will be flagged for errors (e.g., negative values when only positive ones are possible) by qualified personnel in the laboratory (e.g., graduate students, postdocs, PIs).

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.

Data Storage and Access During the Project: The investigators will store project data (including spreadsheets, ASCII files, images and videos) on laboratory computers (usually at least the PI's and a lab computer) that are backed up by the University's central IT organization. Data are also stored in a hard drive, which is periodically backed up.

Mechanisms and Policies for Access, Sharing, Re-Use, and Re-Distribution: Ultimately, data acquired from this project will be preferentially published, but any unpublished data will be perpetually archived. In the case of publication, many journals (e.g., PLOS; Proc. Royal Soc.) now require that all data presented in the publication be available. In such cases we will provide the data as supplementary information in the publications, or deposit the data in an appropriate

depository such as DRYAD (http://datadryad.org/). Sequence data and assemblies will be archived and made available through NCBI's Short Read Archive and DRYAD.

Data files will also 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 end date of the project. 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.

Data produced by this project may be of interest to biological oceanographers, marine biologists and ecologists, and evolutionary ecologists. 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 BCODMO Terms of Use (http://www.bco-dmo.org/terms-use).

Plans for Archiving: The PIs 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: This is a collaborative project between the University of Connecticut, (Lead PI, H. Dam) and the University of Vermont (Lead PI, M. Pespeni). Both PIs will coordinate the overall data management and sharing process and will submit the project data, and metadata to the Biological and Chemical Oceanography Data Management Office (BCODMO) who will be responsible for forwarding these data and metadata to the appropriate national archive.