DATA MANAGEMENT PLAN

Data Policy Compliance

This project will comply with the data management and dissemination policies described in the current *NSF Award and Administration Guide*, *NSF Division of Ocean Sciences Sample and Data Policy*, and *Biological Oceanography Program Data Sharing Expectations.*

Description of Data Types

The project will produce observational, experimental, modeled, and pedagogical datasets, described in the list below. All data will be made publicly available, as described below.

Observational Datasets:

1. Abundance (density) and body size from survey data: Data will include location (lat, long), tidal elevation (meters above mean lower-low water), and abundance and body size of target whelk species (number per square meter and total body length) at 24 sites between Northern California and Baja, Mexico surveyed on 2-4 dates. File type: Excel file converted to .csv. Repository: BCO-DMO, within 2 years of collection.
2. Community diversity data: Data will include location (lat, long), tidal elevation (meters above mean lower-low water), and abundance of all species, as percent cover (sessile species) and density (mobile species) at 24 sites between Northern California and Baja, Mexico surveyed on 2-4 dates. File type: Excel file converted to .csv. Repository: BCO-DMO, within 2 years of collection.
3. Intertidal temperatures: Data loggers will continuously record temperatures for 1-1.5 years at 9 sites between Northern California and Baja, Mexico. Temperature data will be archived by location (lat, long, tidal elevation). File type: Excel file converted to .csv. Repository: BCO-DMO, within 2 years of collection.

Experimental Datasets:

4. Community interactions: Field transplant experiments will be used to evaluate direction and strength of species interactions, including across thermal gradients, at 9 sites between Northern California and Baja, Mexico. File type: Excel file converted to .csv. Repository: BCO-DMO, within 2 years of collection.

Modeled Datasets:

5. Population growth rates: Demographic rates estimated from field observations will be combined with current temperature data in order to forecast population growth rates and abundances under future climate scenarios. File type: .csv. Repository: Provided with publication, including as uploaded to NSF-PAR.
6. Species distributions: Current distributions will be used to forecast potential abundance distributions under future climate scenarios. File type: .csv. Repository: Dryad digital repository, which provides long-term archiving and free access to spatial datasets, within 2 years of collection.

Pedagogical Datasets:

7. Course performance and perspectives: Student learning outcomes based on course performance and perspectives shared in surveys. These data will be stored, published, and

archived incorporating privacy policies (i.e., FERPA). The UCI Teaching and Learning Research Center will facilitate the IRB approval process. File type: .csv. Repository: De-identified data provided with publication, including as uploaded to NSF-PAR.

Data and Metadata Formats and Standards
Raw data will be entered into Excel and converted to .csv files. Metadata will be prepared in accordance with BCO-DMO and Dryad conventions (using appropriate metadata forms) and will include detailed descriptions of collection and analysis procedures. Beyond deposition in BCO-DMO and Dryad, all of our R code for this project will be made publicly available via GitHub by the time of publication.

Data Storage and Access During the Project
The investigators will store project data on laboratory computers that are backed up to both onsite and offsite hard drives. PI Sorte will establish a Google Drive integrated into a project Slack channel for data sharing and collaboration among project personnel.

Mechanisms and Policies for Access, Sharing, Re-Use, and Re-Distribution
PI Sorte will work with BCO-DMO data managers to make project data available online in compliance with the NSF OCE Sample and Data Policy. Data collected under this project will be made openly available without restriction once submitted to the public repositories.

Data produced by this project may be of interest to biological oceanographers and climate scientists studying the impacts of global change on coastal marine systems. Project researchers 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 ensure that project data are submitted to the appropriate national data archives. PI Sorte will work with BCO-DMO to ensure that data are archived with appropriate metadata and other documentation. In addition, all manuscripts resulting from this work will be uploaded to NSF-PAR within 12 months of acceptance.

Roles and Responsibilities
Each project participant will be responsible for maintaining two archives of all data sets immediately following collection and sharing data among the project participants (via upload to the project Google Drive) with 2 weeks of data collection. PI Sorte will coordinate the overall data management and sharing process and will oversee submission of the project data and publications to the appropriate archives (via BCO-DMO, Dryad, and NSF-PAR).