

Data Management Plan

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*.

Description of Data Types

The project will produce observational and derived datasets, as described below.

Observational Datasets:

Shellfish data: Transect identifiers (location, date, time, habitat descriptors), species number and size distribution per transect. Number of pits per transect. Shell litter species identification and size by predator type by transect. Clam growth and age by transect. Excel file converted to .csv. Repository: BCO-DMO

Beach seine data: Haul identifiers (location, date, time, habitat descriptors), species number and size distribution per haul. Excel file converted to .csv. Repository: BCO-DMO

Seagrass community data: Sample identifiers (location, date, time), species composition and biomass of seagrass, mesopredators, grazers, epifauna & epiphytes. File types: Excel file converted to .csv. Repository: BCO-DMO.

Sea otter data: Sample identifiers (location, species, date), counts, species and number consumed. File types: Excel file converted to .csv;. Repository: BCO-DMO.

Kelp data: Sample identifiers (location, date, time), kelp canopy area, kelp canopy density category. File types: Excel file converted to .csv. Aerial UAS photograph mosaics of kelp forests and derived kelp canopy area will be available as .kml and geotiff images. Repository: BCO-DMO.

Environmental data: Sample identifiers (location, species, date, depth), nutrient concentration, temperature, light, salinity, dissolved O₂, sediment carbon %. File types: Excel file converted to .csv. Repository: BCO-DMO.

Derived Datasets:

The project will derive datasets from publicly available data, as described below.

Nearshore fishes: We will use publicly accessible data available from the Nearshore Fish Atlas <http://alaskafisheries.noaa.gov/habitat/fishatlas/>

Shoreline imagery: Alaska ShoreZone Coastal Imagery and Mapping program <http://alaskafisheries.noaa.gov/shorezone/>.

Satellite imagery: We will use publicly accessible data available from NASA's Ocean Color website (<https://oceancolor.gsfc.nasa.gov/>) including sea surface temperature products from the Terra MODIS sensor (2000 – present) and coarser Advanced Very High Resolution Radiometer (AVHRR) sensor (1981 - present).

Kelp canopy area and density will be derived from satellite imagery using Landsat sensors 5 TM, 7 ETM+, and 8 OLI (<https://earthexplorer.usgs.gov/>). These derived datasets will be available as NetCDF files containing the location, date, canopy area, density, and sensor ID for each measured pixel.

Social & Economic Datasets:

Subsistence harvest: Data on community-level harvest of shellfish and sea otters will be derived from data from the Alaska Department of Fish and Game, Subsistence Division and US Fish and Wildlife. File types: Excel file converted to .csv. Repository: BCO-DMO.

Interviews: The qualitative interview data will be compiled and coded, and we will

provide de-identified data sets back to the communities to ensure that we are both protecting confidentiality of individuals and giving appropriate attribution. File types: MS Word file converted to .rtf. Repository: BCO-DMO.

Data and Metadata Formats and Standards

Field observation data will be stored in flat .csv files, which can be read easily by different software packages. Field data will include date, time, latitude, longitude, and sample number, 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). 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 GIS files) on laboratory computers that are backed up by the University's central IT organization. We will utilize the University of Alaska Fairbanks Cloud Services for data storage and sharing among project investigators using Google. Personal computers in all laboratories are backed up daily using Apple Time Machine to an onsite external hard drive, and weekly to an offsite hard drive.

Mechanisms and Policies for Access, Sharing, Re-Use, and Re-Distribution

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.

Data produced by this project may be of interest to biological oceanographers, marine ecologists, and social scientists. 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>).

None of the quantitative social and economic data we will be using are confidential, as they will be lumped in such a way to prevent identification of individuals. Those data will be freely available to the public. Sharing of the qualitative data will pose more confidentiality issues. However, protection of our research participants' rights is also important, and we will work to be transparent in our plans and respectful of our participant's desires throughout the project. Consent forms identify our intent to share de-identified data; we will bring both our analyses and the data sets we intend to share back to the communities to ensure both accuracy and respect for persons.

Plans for Archiving

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

Roles and Responsibilities

The Lead PI, G. Eckert, 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 (BCO-DMO) who will be responsible for forwarding these data and metadata to the appropriate national archive. Each project participant will be responsible for sharing his/her subset of data among the project team in a timely fashion and for following the above data management plan.