

Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

OA Experimental Results - Research on the effects of ocean acidification, climate change, and deoxygenation on marine organisms

1.2. Summary description of the data:

NWFSC scientists are studying the biological effects of ocean acidification on larval geoduck, Pacific oyster, krill, copepods and pteropods (zooplankton that are food for the fish we eat), Dungeness crabs, market squid, surfsmelt and rockfish, all North Pacific species of economic, ecological, or conservation concern that are potentially vulnerable to the effects of ocean acidification, climate change, and deoxygenation. The NWFSC Ocean Acidification (OA) team has built an experimental state-of-the-art facility for growing animals in conditions that mimic pre-industrial, current, and future ocean carbon dioxide levels to observe changes in animal growth, survival and behavior. To more closely mimic conditions that marine organisms experience in the ocean, scientists use the ocean acidification facility to reproduce the natural changes that occur in carbon dioxide levels, temperature, and oxygen concentrations at daily, weekly and seasonal scales.

The experimental system allows for the dynamic control of pCO₂ and other environmental parameters, which enables us to mimic the natural patterns of variability in carbon chemistry that occur on diurnal and tidal cycles and with upwelling events and phytoplankton blooms. The system also provides control over temperature, dissolved oxygen, food delivery and photoperiod, allowing for experiments on multiple stressors. The relatively high water volumes in the system permit simultaneous experiments on multiple species. The laboratory requires constant uptake to maintain its function and will be modified as needed to support our research program.

In addition to the laboratory work, the NWFSC OA team is modeling the effects of ocean acidification on regional marine species and ecosystems using food web models, life-cycle models, and bioenvelope models.

Finally, the NWFSC OA team is collaborating with other Genetics and Evolution Program staff and with other NWFSC scientists to examine the genetic effects of exposure to

ocean acidification in some of these organisms (notably, Dungeness crab, representing one of the most lucrative fisheries in the United States), using proven genetic breeding designs and pedigree analyses, combined with experimental treatments and exposure over multiple generations.

Research on ocean acidification's effects on marine organisms is a focal issue for NMFS and is supported in part by NOAA's Ocean Acidification Program (part of the agency's office of Oceanic and Atmospheric Research). This work has components involving laboratory experiments and outreach. Outreach projects by the NWFSC OA research team include participation in community events (e.g., public presentations, working with school groups, etc.) and development of education materials. They also mentor a relatively large number of undergraduate interns and provide other graduate and undergraduate research opportunities.

Ocean acidification experimental results for Dungeness crab, China rockfish, Pacific herring, bivalves, krill, and other species.

1.3. Is this a one-time data collection, or an ongoing series of measurements?

Ongoing series of measurements

1.4. Actual or planned temporal coverage of the data:

2010-03-01 to Present, 2010-03-01 to Present

1.5. Actual or planned geographic coverage of the data:

W: -122.3062, E: -122.3062, N: 47.6449, S: 47.6449

Ocean acidification lab: NWFSC Montlake wet labs for conducting ocean acidification experiments

W: -122.3062, E: -122.3027, N: 47.9491, S: 47.6449

Ocean acidification lab: NWFSC Mukilteo wet labs for conducting ocean acidification experiments

1.6. Type(s) of data:

(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)

Table (digital)

1.7. Data collection method(s):

(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)**2.1. Name:**

Northwest Fisheries Science Center (NWFSC)

2.2. Title:

Metadata Contact

2.3. Affiliation or facility:

Northwest Fisheries Science Center (NWFSC)

2.4. E-mail address:

nmfs.nwfsc.metadata@noaa.gov

2.5. Phone number:

206-860-3200

3. Responsible Party for Data Management

Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:

Paul McElhany

3.2. Title:

Data Steward

4. Resources

Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

Yes

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

.5

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Lineage Statement:

Observations of organism growth, development and physiology: These data were collected and processed in accordance with established protocols and best practices under the direction of the project's Principal Investigator. Contact the dataset Data Manager for full QA/QC methodology.

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

These data were collected and processed in accordance with established protocols and best practices under the direction of the project's Principal Investigator. Contact the dataset Data Manager in section 3 for full QA/QC methodology.

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

No

6.1.1. If metadata are non-existent or non-compliant, please explain:

Missing/invalid information:

- 1.7. Data collection method(s)

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

<https://www.fisheries.noaa.gov/inport/item/18592>

6.4. Process for producing and maintaining metadata

(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

No

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

No

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

NA

7.2. Name of organization of facility providing data access:

Northwest Fisheries Science Center (NWFSC)

7.2.1. If data hosting service is needed, please indicate:

No

7.2.2. URL of data access service, if known:

7.3. Data access methods or services offered:

At this time, contact the Data Manager for information on obtaining access to this data set. In the near future, the NWFSC will strive to provide all non-sensitive data resources as a web service in order to meet the NOAA Data Access Policy Directive (<https://nosc.noaa.gov/EDMC/PD.DA.php>).

7.4. Approximate delay between data collection and dissemination:

0 days

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

No Delay

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:

(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

NCEI_MD

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):

Northwest Fisheries Science Center - Seattle, WA

8.3. Approximate delay between data collection and submission to an archive facility:

365

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection

The Northwest Fisheries Science Center facilitates backup and recovery of all data and IT components which are managed by IT Operations through the capture of static (point-in-time) backup data to physical media. Once data is captured to physical media (every 1-3 days), a duplicate is made and routinely (weekly) transported to an offsite archive facility where it is maintained throughout the data's applicable life-cycle.

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.