

Data Management Plan: OR Mooring - Ocean Acidification related measurements

(Taken from NOAA Data Sharing Template and adapted for IOOS Certification)

I. Type of data and information created

1. What data will you collect or create in the research?

Contextual statement describing what data are collected and relevant URL (IOOS Certification, f 2)

Hales' component of the data collection effort centers on moored observations of Ocean Acidification (OA)-relevant information. Of these, there is a NOAA-PMEL-owned M_{Ap}CO₂ unit in the moorings' surface expression and near-bottom-deployed mooring packages for the same. The data is served in near-real time by the PMEL CO₂ group, and uploaded to NOAA-NCEI databases after QC performed by NOAA-PMEL personnel. The near-bottom data are downloaded and QC'd by Hales, and delivered to NCEI when evaluated.

2. What data types will you be creating or capturing?

The systems measure pCO₂, pH, temperature, salinity, and sometimes O₂.

3. How will you capture or create the data?

Describe how the data are ingested (IOOS Certification, f 2)

M_{Ap}CO₂ data are logged internally and broadcast by iridium cellular modem to NOAA-PMEL. Near-bottom data is logged internally in system data loggers. Since telemetry is not available for these subsurface autonomous packages, data is ingested by downloading stored data by OSU personnel after recovery of the sensor packages.

Describe how data are managed (IOOS Certification, f 2)

M_{Ap}CO₂ data are made available online by NOAA-PMEL CO₂-group personnel and to NANOOS data managers. QC'd data is delivered to NCEI by PMEL personnel. Near-bottom data is QC'd by OSU personnel after sensor recovery, QC'd and subsequently delivered to NCEI personnel.

Describe the data quality control procedures that have been applied to the data. (IOOS Certification, f 3)

Several levels of QC are applied. Most fundamental is the assessment of basic sensor performance. For surface M_{Ap}CO₂ systems, functioning can be assessed by examining the telemetry data, and operational problems can be corrected remotely, or by site visits. For near-bottom data, performance can only be assessed post-recovery. The existence and realism of sensor data is assessed first. If data were recorded, are there physically unrealistic values (e.g. negative pH or pCO₂ values, NaN, Inf) within the record? If so, these data are rejected. For remaining data, property-property relationships are employed to identify and reject erroneous results (e.g. do T-S distributions fall in generally the range expected for the region based on historical observations? Do pCO₂, pH, and O₂ covariances diverge in ways that cannot be explained by changes in hydrography or

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biological processes?) Again, such data are rejected. Finally, periodic opportunistic validation samples are collected in proximal time/space to the moored sensors, and analyzed in the laboratory as an independent assessment of the in situ observations' quality. Most significant data QC issues for otherwise functioning sensors is related to bio-fouling, particularly of the surface mooring elements.

As a NANOOS Observing System provider, we follow industry best practices and manufacturer guidance where applicable, to calibrate, operate, and maintain the equipment used in this effort, and will provide documentation of this upon request.

Further, we maintain equipment inventories, shipping logs, and instrument maintenance history logs, as appropriate, that are available upon request.

- 4. If you will be using existing data, state that fact and include where you got it. What is the relationship between the data you are collecting and the existing data?**

N/A

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II. Expected schedule for data sharing

Adheres to the NOAA Data Sharing Procedural Directive. The System is an operational system; therefore the RICE should strive to provide as much data as possible, in real-time or near real-time, to support the operation of the System. (IOOS Certification, f 4)

Data will be made available to the public following QC efforts, which will generally happen within 6 months of system recovery and download of full data records. In rare cases, data that is deemed to have failed QC will be re-assessed at later dates and released if corrective measures can be taken to correct flaws in the data record.

- 1. How long will the original data collector/creator/principal investigator retain the right to use the data before opening it up to wider use?**

N/A

- 2. How long do you expect to keep the data private before making it available? Explain if different data products will become available on different schedules (Ex: raw data vs processed data, observations vs models, etc.)**

N/A

- 3. Explain details of any embargo periods for political/commercial/patent reasons? When will you make the data available?**

N/A

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III. Standards for format and content

1. Which file formats will you use for your data, and why?

How can the information be accessed? (IOOS Certification, f 2)

All data will be made available as flat ASCII-format files with timestamp as the leading column. All data files will include header information describing the data record, and column titles for each column.

2. What file formats will be used for data sharing?

ASCII data files delivered to NCEI may be converted to other formats and shared at the discretion of NCEI data managers.

3. What metadata/ documentation will be submitted alongside the data or created on deposit/ transformation in order to make the data reusable?

Metadata relevant to each data record is included in the header of each file, and is provided upon delivery to NCEI as a descriptive text file.

4. What contextual details (metadata) are needed to make the data you capture or collect meaningful?

Metadata relevant for each data record will include the location of the moored deployment (lat, lon, depth) and the description of the deployed sensor packages, and commentary regarding additional coordinated data collection efforts (e.g. the meteorological data and physical-oceanographic collected by the physical oceanographic collaborators).

5. How will you create or capture these details?

These meta data will be created manually by OSU and NOAA-PMEL personnel.

6. What form will the metadata describing/documenting your data take?

Descriptive ASCII files delivered to NCEI and served there at NCEI discretion.

7. Which metadata standards will you use and why have you chosen them? (e.g. accepted domain-local standards, widespread usage)

Fixed-location moored time-series data and metadata are presented in these formats with widespread usage.

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IV. Polices for stewardship and preservation

1. What is the long-term strategy for maintaining, curating and archiving the data?

Points of contact- Individuals responsible for the data management and coordination across the region (CV's attached); (IOOS Certification f 1.i)

Burke Hales, PI, 541 737-8121; bhales@coas.oregonstate.edu. Broader coordination is carried out by ultimate data repository personnel (e.g. NCEI).

Identify the procedures used to evaluate the capability of the individual (s) identified in subsection 997.23(f)(1) to conduct the assigned duties responsibly. (IOOS Certification, f 1.iii)

N/A

2. Which archive/repository/database have you identified as a place to deposit data?

Documents of the RICE's data archiving process or describes how the RICE intends to archive data at the national archive center (e.g., NODC, NGDC, NCDC) in a manner that follows guidelines outlined by that center. Documentation shall be in the form of a Submission Agreement, Submission Information Form (SIF) or other, similar data producer-archive agreement (IOOS Certification, f 6).

National Centers for Environmental Information (NCEI) is the federal archive repository. All data are archived at Oregon State University.

3. What procedures does your intended long-term data storage facility have in place for preservation and backup?

Local redundant HDD storage and NCEI.

4. How long will/should data be kept beyond the life of the project?

Data are indefinitely stored.

5. What data will be preserved for the long-term?

All data are publicly available and preserved.

6. What transformations will be necessary to prepare data for preservation / data sharing?

Raw data are decoded and formatted, analyzed and quality controlled.

7. What metadata/ documentation will be submitted alongside the data or created on deposit/ transformation in order to make the data reusable?

Descriptive ASCII files delivered to NCEI will be made available.

8. What related information will be deposited? N/A

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V. Procedures for providing access

- 1. What are your plans for providing access to your data? (on your website, available via ftp download, via e-mail, or another way)**

Describe how data are distributed including a description of the flow of data through the RICE data assembly center from the source to the public dissemination/access mechanism. (IOOS Certification, f 2 and 4)

- 2. Will any permission restrictions need to be placed on the data?**

No data restrictions are expressly intended; however, the PI retains the right to indefinitely reconsider data and withdraw those deemed unacceptable post-deposition, and to belatedly deposit data that may have been deemed initially to have failed QC.

- 3. With whom will you share the data, and under what conditions?**

Data are publicly available.

- 4. Will a data sharing agreement be required?**

Data sharing agreement is not required, however, data sources should be acknowledged, and it is the responsibility of end users to maintain awareness of corrections and additions to deposited data records.

- 5. Are there ethical and privacy issues? If so, how will these be resolved?**

N/A

- 6. Who will hold the intellectual property rights to the data and how might this affect data access?**

The funding agency and the NCEI will have full intellectual rights to the data.

VI. Previous published data