1. DATA AND INFORMATION TYPES

A. Provide a contextual description of the data stream.

Data collection was supported by multiple awards to Bodega Marine Laboratory, University of California, Davis and an award from NOAA's Integrated Observing System to the Central and Northern California Ocean Observing System at the Monterey Bay Aquarium Research Institute (NA21NOS0120090).

The Bodega Head shore station is a seawater intake site operated by the Bodega Marine Laboratory of the University of California, Davis and is located in Bodega Bay, CA. Sea water is pumped to the shore from an intake located at Horseshoe Cove and has been active since 2003. The station measures water temperature, conductivity, salinity, chlorophyll, and sea water density. More details about this monitoring station can be found on the Bodega Ocean Observing Node website. This station is maintained by staff of the Bodega Marine Lab and is part of the Bodega Ocean Observing Node (BOON) project.

The Fort Point shore station is located at Fort Point Pier in San Francisco, CA and consists of seabird 16+ CTD, WETLabs transmissometer, and Seapoint Fluorometer fixed at 2 meters below MLLW to a wooden piling on the Greater Farallones National marine Sanctuary pier. A Co-located meteorological sensor. The station has been operational since 2004. This station is maintained by staff of the Bodega Marine Lab and is also part of the BOON project.

The Hog Island shore station is located at the Hog Island Company Shellfish Hatchery in Marshall, CA along Tomales Bay. A CO_2 station, called a Burkolator was installed in 2014 to provides near-real time measurements of water temperature, salinity, dissolved inorganic carbon, aragonite saturation state, partial pressure CO_2, pH, and total alkalinity. The site is operated by staff at University of California, Davis and is part of the IOOS Pacific Region Ocean Acidification (IPACOA) network.

The stations can be accessed through the CeNCOOS data portal: http://l.axds.co/2ENOKnG

B. How many station locations are there for this data stream?

There are 3 station locations:
Bodega Bay (BML_WTS), Bodega Bay, CA (38.316334N, 123.070843W)
Fort Point, San Francisco, CA (37.806355N, 122.466052W)
Hog Island Oyster, Marshall, CA (38.1620N, 122.8939W)

C. What are the specific variables of the data.

The variables for Bodega Bay (BML_WTS) includes:
sea_water_pressure,mass_concentration_of_chlorophyll_in_sea_water,sea_water_temperature,sea_water_density,sea_water_electrical_conductivity,sea_water_practical_salinity

The variables for Fort Point includes:
sea_water_pressure,mass_concentration_of_chlorophyll_in_sea_water,sea_water_temperature,sea_water_density,sea_water_electrical_conductivity,sea_water_practical_salinity

The data from Hog Island Oyster have changed:
pCO2,omega_aragonite,,dissolved_carbon_dioxide_co2,sea_water_ph_reported_on_total_scale,sea_water_alkalinity_expressed_as_mole_equivalent are no longer collected at the site. The site now only has sea_water_temperature and sea_water_practical_salinity.

D. Provide information about the sampling platform or instrumentation.

The instrumentation for the Bodega Bay (BML_WTS) station is:
Sea-Bird Electronics SBE 16+ SEACAT (Conductivity, Temperature)
Seapoint Fluorometer w/ 10x gain (Chlorophyll)
 Station details can be found:
https://www.cencoos.org/data/shore/bodega

The instrumentation for the Fort Point station is:
Sea-Bird Electronics SBE 16+ SEACAT (Conductivity, Temperature)
WetLabs C-Star Transmissometer (Transmittance)
Seapoint Fluorometer (Chlorophyll)
Station details can be found: http://boon.ucdavis.edu/fort_point.html

The Hog Island Shore Station is located in Marshall, CA at the Hog Island Company's shellfish hatchery. The no longer has a Burkeolator and only has LakeTech sensors.

Station details can be found:
https://www.cencoos.org/wp-content/uploads/2020/03/cencoos_Standard_Operating_Procedures.pdf

2. DATA PATHWAY

A. Is a data sharing agreement required?

The data may be used and redistributed for free but is not intended for legal use, since it may contain inaccuracies. Neither the data Contributor, ERD, NOAA, nor the United States Government, nor any of their employees or contractors, makes any warranty, express or implied, including warranties of merchantability and fitness for a particular purpose, or assumes any legal liability for the accuracy, completeness, or usefulness, of this information.

B. In which format(s) was data received by CeNCOOS?

Bodega Bay: Exported as CSV from http://bmlsc.ucdavis.edu:8080/erddap/tabledap

Fort Point: Data are downloaded from web harvest to the originator's ERDDAP site:
http://bmlsc.ucdavis.edu:8080/erddap/tabledap

Hog Island: Data are rsync'd from a laptop to Axiom for ingestion and distribution.

C. How can the information be accessed?

The data are available through the CeNCOOS data portal, where it can be downloaded or explored through interactive visualizations. Specifically, data are available from two unique access points:
- File Downloads (CSV)
- ERDDAP

D. What file formats will be used for sharing data, if different from original?

Shore stations: Data are shared as CSV and through ERDDAP. Data are also available for exploration in the CeNCOOS portals via interactive, graphical visualizations.

E. Describe how the data is ingested(e.g. the flow of data from source to CeNCOOS data portals) and any transformations or modifications made to share data in the CeNCOOS data portal.

Data are downloaded from the source to the CeNCOOS storage. Custom Java, Scala, and Python scripts are used to convert data formats suitable for internal and external interoperability services. Data are made available in the CeNCOOS portals through the access points and via graphic displays generated through internal JSON-format data requests from these services.

Graphic displays include a mapping service, customized interactive visualizations, and time-series plots of the unit values wherein each parameter is graphed independently. Back-end scripts handle the conversion of visualized data from CF standards to other, non-CF units that may be requested by the user. Data files may be downloaded by the user from the CeNCOOS data portal. A user request for a CSV file request pulls the data from the server cache. A user request for ERDDAP pulls data from the ERDDAP service using the same cache. For this data, no CF-standard names or units exist, therefore custom names of abundance_of_{scientific_name} were used.

Summary statistics generated within the interactive graphical displays may be requested by the user. Summary statistics may include minimum, maximum and mean values. Seasonal statistics, available on time series longer than 3 years, include mean, and 10th and 90th percentiles. Note: the number of points visually available to interactive users from the source data are limited when necessary using temporal binning, such as daily, weekly, monthly, seasonally and yearly.

F. What metadata or contextual information is provided with the data?

Metadata are shared in the CeNCOOS portals with descriptive narratives describing the data and linking back to the originator's site. Metadata are also available via ERDDAP:

Bodega Bay (BML_WTS):
https://erddap.cencoos.org/erddap/tabledap/bodega-bay-bml_wts.html

Fort Point:https://erddap.cencoos.org/erddap/tabledap/fort-point.html
Hog Island Oyster: https://erddap.cencoos.org/erddap/tabledap/hog-island-hatchery.html

G. Are there ethical restrictions to data sharing?
No

   a. **If so, how will these be resolved?**
     N/A

H. Who holds intellectual property rights (IPR) to the data?
University of California, Davis and CeNCOOS

I. Describe any effect of IPR on data access.
None

3. DATA SOURCE AND QUALITY CONTROL

A. Indicate the data source type (i.e. Federal, Non-Federal, University, State Agency, Local Municipality, Military Establishment (branch), private industry, NGO, non-Profit, Citizen Science, Private individual)
University

   a. **If Federal data source, were changes applied to the data?**
     N/A

   b. **If Yes, describe any changes to the data that require documentation?**
     N/A

B. Indicate the data reporting type (e.g. real-time, historical).
Real-time:
Bodega Bay (BML_WTS)
Fort Point
Hog Island Oyster

C. If real-time, list the QARTOD procedures that are currently applied.
The QARTOD tests that have been applied to the data by CeNCOOS are: timing gap, syntax, location, gross range, climatology, spike, rate of change, flat line and attenuated signal test. Refer to CeNCOOS Data Management System plan for details.

D. If real-time, list the QARTOD procedures that are planned for implementation.
No further QARTOD tests are planned.

E. What is the status of the reported data? (e.g. raw, some QC, incomplete, delayed mode processed but not QC'd)

QARTOD applied by Axiom.

F. Describe the data control procedures that were applied by the originator.
No explicit QC applied by the originator. Data are monitored by the originator and instrumentation are swapped as determined by the originator.

    a. Provide a link to any documented procedures.
      N/A

G. Describe the data control procedures that were applied by CeNCOOS.
N/A

    a. Provide a link to any documented procedures.
      N/A

H. List the procedures taken for data that could not be QC'd as directed.
N/A

4. STEWARDSHIP AND PRESERVATION POLICIES

A. Who is responsible for long-term data archiving?
Data was aggregated for visualization and exploration with other layers in the CeNCOOS data portal. If the data provider chooses to archive these data at a national archive in the future, they may do it directly, or using the CeNCOOS-facilitated pathway to NCEI.

B. Which long-term data storage facility will be used for preservation?
Real-time and near real-time data are automatically archived to NCEI from CeNCOOS. Archived datasets can be viewed at
https://www.ncei.noaa.gov/access/integrated-ocean-observing-system/

For more information about CeNCOOS archival practices see DMP Section 4.8 Data Archival

C. Describe any transformation necessary for data preservation.
Data are formatted to NCEI specifications for archival. See DMP Appendix H1.1 NCEI Archival Agreement for descriptions of NCEI archival methods.

D. List the metadata or other documentation that will be archived with the data.
N/A