

NODC Ocean Acidification Scientific Data Stewardship Data and Metadata Submission and Documentation Guidelines

The NODC Ocean Acidification Scientific Data Stewardship ([OADS](#)) team has developed ocean acidification (OA) data and metadata submission guidelines and documentation designed for optimized data discovery, transparent access, data sharing, long-term archival and scientific management of NOAA Ocean Acidification Program ([OAP](#)) funded [data projects](#). This document addresses OA data from ships of opportunity, autonomous sensor data (e.g., moorings), gliders, research ships (e.g., discrete water samples from Niskins, CTD data, underway), laboratory and field experiments, and models. All of the NODC archived data are available via our [geoportal](#) and other interoperable [NODC data services](#). In addition, our OADS Team is working toward developing a dedicated online OA data selection tool with enhanced search capabilities based on our rich OA metadata using ISO 19115-2.

We make emphasis in the development of rich and complete metadata using international standards (e.g., ISO 19115-2) including acknowledgement and reference to the data providers and data quality documentation. Our metadata templates include metadata available at data acquisition centers such as [CDIAC](#), <http://bcodmo.org/>, <http://cchdo.ucsd.edu/>. In addition, we plan to work in cooperation with the Ocean Acidification International Coordination Center ([OA-ICC](#)). Before you send your data to NODC, we recommend that you contact us at NODC.Ocean.Acidification@noaa.gov to facilitate your data submission.

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The outline below is meant to guide you through submitting your ocean acidification data and metadata to NODC for long-term archival. Please contact us with any questions or comments at NODC.Ocean.Acidification@noaa.gov, nodc.dataofficer@noaa.gov. This document is available also in PDF ([OADS Data Submission Guideline April 30, 2013](#)).

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1. Sending data to NODC for long-term archival, discovery, and access

You can send your data to NODC in a variety of ways. While not mandatory, we prefer that you send your data via File Transfer Protocol (FTP). We have set up a dedicated ftp address for submission of NOAA OAP data to NODC at <ftp://ftp.nodc.noaa.gov/pub/incoming/oads/>

FTP:

- Enter "ftp ftp.nodc.noaa.gov"
- When prompted for name, enter "anonymous" (use lower case)
- When prompted for password, enter your e-mail address
- When logged on, change directory to "pub/incoming/oads" by entering: "cd pub/incoming/incoming/oads/" (**Note:** You will not be able to create a new directory)
- Change transfer type to ASCII by entering "ascii" if the data files are text. If the file is an image file, or a special PC format (word processor, spread sheet, presentation graphics) do not change the type to ascii, but make sure the transfer type is binary by entering "bin"
- Use "put filename", where "filename" is the name of your file, or for multiple files use "mput *.*" or "mput *" to transmit the data files. When transferring multiple files you can turn off the prompt for each filename by typing "prompt" before you type the "mput" command
- After completion of file transmission, enter "ls" to obtain a list of files that were sent, both by you and other recent data submitters
- Enter "bye" to log off
- Send an e-mail message to NODC.Ocean.Acidity@noaa.gov, nodc.dataofficer@noaa.gov to let us know that ocean acidification related data were submitted for archival at NODC. Please describe your exact submission procedures and anything else you would like us to know about the data

2. Preparing your metadata

Following NOAA's directives for management of environmental data and information (e.g., [NOAA's Administrative Order 212-15](#)), our OADS team has developed rich and detailed descriptive metadata templates using the International Organization for Standardization (ISO) Metadata standard (ISO 19115-2 extension of 19115) to make the online data easily discoverable, shareable, usable, and understandable for the long-term.

***In situ* observational data:** To the extent possible, please prepare your OA metadata according to the [OADS Observational Metadata Content Standard templates](#):

Ideally, you should send your metadata to NODC using our [OA metadata submission text template](#)] [see [Example for the text template](#)] [See [Instructions about the metadata terms in the text template](#)]

Alternatively, if you have experience using Extensible Markup Language (xml) files, you could send your metadata using our [XML \(ISO 19115-2\) template](#)].

Remarks: (a) Please make sure to document the pH scale used (e.g., NBS, total, free, seawater, etc) if pH data are provided (e.g., Dickson et al. 2007). (b) Please note that our current metadata standard for observational OA data includes a place where the data provider can enter information describing data quality (e.g., [WOCE bottle quality flags](#), [IODE Ocean Data Standards: Recommendation for a Quality Flag Scheme for the Exchange of Oceanographic and Marine Meteorological Data](#)).

Experimental or biological response data: We are in the initial stages of developing metadata appropriate for experimental or biological response data. A draft metadata content template is under review: [[MS Word](#)] [[PDF format](#)]

An [inter-agency ocean acidification parameter vocabulary group](#) was formed with the goal to create an ocean acidification parameter list to facilitate OA data sharing. The approved ocean acidification parameters will be published in the [Interagency Ocean Acidification Parameter list](#) which resides on the Marine Metadata Interoperability (MMI) web site. The metadata builds on and greatly expand existing metadata reporting (e.g., Riebesell et al., 2010)

3. Archival, access, and discovery of embargoed data

NODC follows an open data access policy. However, NODC will archive restricted access NOAA funded OA data when data access restrictions are specified for a finite amount of time (e.g. 6 months, 1 year, etc.). Data with online access restrictions archived at NODC will be inaccessible to the public but the metadata will be made available and discoverable through NODC data access search interfaces (e.g., [geoportal](#)). Metadata will indicate the date after which any restricted data will be released and made publicly accessible online without restrictions. The metadata will include the contact information for the data producer (e.g., PI's) so that interested users can contact the producer to request access to the data prior to the public release date and for any questions.

4. Attribution of data and Digital Object Identifiers

We want to make every effort to help ensure recognition to PIs data providers by providing permanent identifiers (e.g., DOI) to their data and for the citation of that data. The NOAA Environmental Data Management Committee ([EDMC](#)) and the Data Management Integration Team ([DMIT](#)) initiated a pilot project to assign digital object identifier ([DOI](#)) but a formal implementation procedure for requesting and assigning DOI's is not yet in place yet as of April 01, 2013. In addition to assigning a unique [NODC accession number](#) and maintaining data version control of the data in our archive, OADS plans to assign a DOI to every NOAA funded OA data set received once a plan is implemented in accordance with NOAA policy. While this plan is implemented, the [OADS metadata template preparation](#) provides rich documentation about data attribution. OADS explores adopting additional strategies to further ensure data attribution following current best practices for data publication (e.g., Leadbetter et al, 2013).

5. Data file format preparation

No specific ocean acidification data format is required. However, to help ensure that no information is lost in translation from your native data file format to an archival format and that NODC can port your data to new digital systems over the long-term, we recommend ASCII character encoding (e.g., comma-separated values (CSV), text columns) or NetCDF file format. Please avoid the use of commercial proprietary data file formats.

The use of a widely used file format such as NetCDF is encouraged because it improves the long-term access, portability, and use of the data. NODC has developed feature type [NetCDF templates](#) (see [feature type templates and examples](#)). These templates conform to Unidata's NetCDF Attribute Convention for Dataset Discovery ([ACDD](#)) and NetCDF Climate and Forecast ([CF](#)) conventions.

6. Data file organization preparation

No data file organization is required. If you plan to an ASCII and/or NetCDF file formats, we recommend the following guidelines to organize your data:

***In situ* observational data:**

If you plan to use an ASCII file format and organize your data following column headers, we suggest using:

- **Underway data:** [Column header names description \(data file \(csv\) example\)](#)
- **Profile data (e.g., CTD, discrete bottle water samples, etc):** [Column header names description \(data file \(csv\) example\)](#)
- **Mooring data (e.g., buoys):** [Column header names description \(data file \(csv\) example\)](#)

If you plan to use NetCDF, we suggest using our [NODC NetCDF templates](#). Please feel free to leave out variables that you did not collect or include variables that you collected but are not listed in this guidance. Please properly distinguish 'missing values' from 'zero values'.

Experimental/biological response data: Guidelines in preparation

Model data: Guidelines in preparation

7. What to expect once you data have been submitted to NODC for archival

Once your OA data and metadata are submitted, your data will be prepared for [long-term archival](#) and optimized for OA data discovery and access through our NODC web services (e.g., [Geoportal](#), [Live Access Server](#), [OPeNDAP services](#)) and data products such as the World Ocean Database where appropriate (See [Archival and Access to Embargoed Data](#))

8. To Update your data set after it is submitted to NODC

Should any changes be needed to a data set that you have submitted, please send an e-mail message to: NODC.Ocean.Acidity@noaa.gov, nodc.dataofficer@noaa.gov to let us know

9. What to do if you want NODC to submit your data to one or more data acquisition centers (DACs)?

If you submit your data set to NODC, we will arrange to notify and transfer if appropriate a copy of the data set to data acquisition centers (e.g., CDIAC) after your submission with your permission. To help us do that, please send an email to NODC.Ocean.Acidity@noaa.gov, as soon as the data submission is complete. In the email, please describe:

- Title of your data set, and any other data set identifiers if available (e.g., [NODC accession number](#), DOI, location, etc)
- Which data acquisition center you want NODC to contact to notify and submit if appropriate your data with your explicit permission
- Date and time of your data submission
- A point of contact for future communication concerning this data set (OADS staff will contact your research group for additional questions if any)

10. What to do if you submitted your data to a data acquisition center (DAC) and not to NODC?

If you submit your data set to a DAC, we will arrange with the data center to transfer a copy of the data set to NODC after your submission with your permission. To help us do that, please send an email to NODC.Ocean.Acidity@noaa.gov, as soon as the data submission is complete. In the email, please describe:

- Title of your data set, and any other data set identifiers if available (e.g., DOI)
- Which data center you submitted your data to
- Date and time of your data submission
- A point of contact for future communication concerning this data set (OADS staff will contact your research group for additional questions if any)

References

Dickson, A.G., Sabine, C.L. and Christian, J.R. (Eds.) 2007. Guide to best practices for ocean CO₂ measurements. PICES Special Publication 3, 191 pp [[web](#), [Dicksonetal2007_guide_all_in_one.pdf](#); [Errata](#)]

Leadbetter, A., Raymond, L., Chandler, C., Pikula, L., Pissierssens, P., Urban, E. (2013) Ocean Data Publication Cookbook. Paris: UNESCO, 41 pp. & annexes. (Manuals and Guides. Intergovernmental Oceanographic Commission, 64), (IOC/MG/64) [[Ocean Data Publication Cookbook](#)]

Riebesell U., Fabry V. J., Hansson L. & Gattuso J.-P. (Eds.), 2010. [Guide to best practices for ocean acidification research and data reporting](#), 260 p. Luxembourg: Publications Office of the European Union. [[OA_guide_20110726.pdf](#)]

Need Help?

For questions please contact us at NODC.Ocean.Acidity@noaa.gov

Web page last updated April 30, 2013 10:25 AM