



Data Management Planning Procedural Directive

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I. Purpose

The goal of Data Management planning is to ensure that data are properly documented, made accessible, and preserved for future use. NOAA Administrative Order (NAO) 212-15, *Management of Environmental Data and Information*,¹ states that environmental data are to be managed based upon a lifecycle that includes developing and following a Data Management Plan (DM Plan). The purpose of this Procedural Directive is to support the requirement for DM Plans by providing detailed guidance on who should write DM Plans and how to write them. This Directive directs managers of all data production or data collection programs and systems to ensure data management plans are developed for their data. The Directive provides a Template (Appendix A) with questions to be addressed regarding NOAA environmental data.

II. Scope

This Directive applies to:

- Digitally formatted environmental data² and derived data products (hereinafter referred to as "data") resulting from observing systems, numerical models, human-collected measurements, research projects, or other acquisition methods.
- Data created within NOAA or by NOAA contractors.
- All current and future data.

¹ http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_212/212-15.html

² See definitions in Section XI.

- All data archived at the NOAA National Centers for Environmental Information (NCEI).³

This Directive does not apply to:

- Data produced by NOAA grantees or Cooperative Institutes, which are instead subject to the *NOAA Data Sharing Policy for Grants and Cooperative Agreements*.⁴
- Data acquired from external sources, which are instead subject to the *NOAA Recommended Practice for Use of External Data*.⁵
- Non-archived legacy data that are no longer in use at NOAA and whose collection and processing were completed prior to the issuance of this Directive.
- Non-digital media (such as paper or analog tape), physical specimens, and preserved samples.
- Text-based warnings, advisories, forecasts, and similar narrative products.

III. Authority

This Directive has been issued by the NOAA Environmental Data Management Committee (EDMC), with the approval of the NOAA Chief Information Officer (CIO) Council and the NOAA Observing System Council (NOSC), pursuant to the authorities granted in NAO 212-15.

Relevant agency and national policy:

- NOAA Environmental Data Management Framework⁶
- US Open Data Policy (OMB Memorandum M-13-13)⁷
- OSTP Memorandum on Increasing Public Access to the Results of Federally-Funded Research⁸

IV. Directive

1. All NOAA environmental data shall be covered by a data management plan (DM Plan).
 - 1.1. All NOAA Programs or Systems that produce or collect environmental data⁹ shall have DM Plan(s) for the data they produce internally or commission via contracts.
 - 1.2. A single DM Plan may cover multiple data types that are managed similarly.
 - 1.3. DM Plans may be hierarchical. Specifically, a master plan applicable to a group of observing systems or data types may be developed, supplemented by more specific plans that inherit the provisions of the master plan and provide data-specific details. In this case, the specific plans shall include a reference to the applicable master plan.
 - 1.4. DM Plans shall be followed and maintained throughout the full lifecycle of all the data

³ NCEI includes the organizations previously referred to as National Climatic Data Center (NCDC), National Geophysical Data Center (NGDC), and National Oceanographic Data Center (NODC).

⁴ <https://www.nosc.noaa.gov/EDMC/PD.DSP.php>

⁵ <https://www.nosc.noaa.gov/EDMC/RP.UED.php>

⁶ <https://www.nosc.noaa.gov/EDMC/framework.php>

⁷ <http://www.whitehouse.gov/sites/default/files/omb/memoranda/2013/m-13-13.pdf>

⁸ http://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

⁹ The current list of NOAA programs, laboratories, and other entities that have responsibility for data management planning is available on NOAA Google Drive at <http://goo.gl/R9lfAi> (visible by noaa.gov only). This list is based on information received to date but is subject to correction based on LO input, and subject to change as programs are created or retired.

within the scope of the Plan.

- 1.5. DM Plans shall be revised or superseded as needed if circumstances change.
2. DM Plans shall be based on the Template (Appendix A of this Directive). The Template is a series of questions to be addressed. This generic Template may be modified to better meet the needs of NOAA Line Offices and Staff Offices (LO/SO) as follows:
 - 2.1. NOAA LO/SO may extend the Template by adding questions, in which case the relevant EDMC representative shall notify the EDMC of such extensions.
 - 2.2. NOAA LO/SO may adopt a simplified version of the Template (by removing or making optional some questions), subject to approval by the EDMC.¹⁰ The relevant LO/SO rep shall seek approval by arranging for briefing and discussion at an EDMC meeting.
 - 2.3. NOAA LO/SO may not modify or reword existing questions in the Template without approval by the EDMC and updating of this Procedural Directive.¹¹
3. Data Management Plans shall be submitted to the Data Management Plan Repository¹² established by NOAA's Technology Planning and Integration for Observations (TPIO) program.
 - 3.1. EDMC LO/SO representatives shall have permission to create and manage their designated section of the DM Plan Repository.
 - 3.2. DM Plan authors shall coordinate submission with their LO/SO representative.¹³
 - 3.3. Plans shall be uploaded in PDF format.
4. Grant programs and managers of Cooperative Institutes shall ensure they and their grantees follow the provisions of the NOAA *Data Sharing Policy for Grants and Cooperative Agreements*.⁴

V. Responsibilities

- Program managers, or their designee, shall be responsible for identifying resources within their own budget to manage the data they produce, for coordinating with NOAA National Data Centers as needed, and for ensuring required DM Plans are written, reviewed, submitted, followed throughout the lifecycle of the data, and revised as circumstances warrant.
- NOAA National Data Centers shall follow the provisions of the *NOAA Procedure for Scientific Records Appraisal and Archive Approval*¹⁴ in assessing data submission requests.
- Data Stewards shall perform the tasks needed to implement the DM Plan throughout the lifecycle of the data under their purview.
- EDMC Line Office and Staff Office representatives shall be responsible for seeking EDMC approval for LO/SO-specific modifications of the Template (Appendix A).
- EDMC members shall be responsible for reviewing and determining whether to approve LO/SO-specific modifications.
- EDMC, or a designated work team, shall review this Directive at least every 3 years and shall issue revisions as needed.
- TPIO shall maintain the DM Plan Repository.
- The NOAA Chief Information Officer shall be responsible for managing this Directive in

¹⁰ Approval is required to ensure this Directive is not weakened by making key questions optional.

¹¹ The intent of standardized wording is to ensure consistency across the resulting plans and to enable automated assessment.

¹² The DM Plan Repository is currently a set of folders on NOAA Google Drive at <http://goo.gl/mVazW>. This approach may in future be replaced by an online form-based tool to create plans.

¹³ EDMC members are listed at <https://www.nosc.noaa.gov/EDMC/edmc-membership.php>. For technical support contact noaa.tpio.dma@noaa.gov.

¹⁴ https://www.nosc.noaa.gov/EDMC/documents/NOAA_Procedure_document_final_12-16-1.pdf

consultation with the CIO Council, the NOAA Observing Systems Council and the Environmental Data Management Committee.

VI. Management and Ownership

This Procedural Directive is issued and managed by the NOAA Environmental Data Management Committee.

VII. Intended Audience

This Directive applies to NOAA Programs that produce environmental data (as defined in Section XI), or that commission the production of environmental data through contracts.⁹

VIII. Implementation Date

This EDMC Procedural Directive shall take effect on January 1, 2015.

New data collections initiated after this date shall develop and submit a DM Plan prior to publication or operational use of the data.

Ongoing data collections as of this date shall develop and submit a DM Plan within one year of this date. If any required plans cannot be developed by this deadline for all data collections managed by a NOAA Line Office or Staff Office, a list of pending plans and a schedule for completion shall be submitted by that Office to the EDMC for transmittal to NOSC and CIO Council.

IX. Grandfather Exemption and Waiver Option

Grandfather exemptions:

- Legacy data (data whose collection was completed prior to this date, and which are no longer in use at NOAA) are exempt from this Directive.
- DM Plans submitted pursuant to an earlier version of this Directive (based on a different Template) are considered to have satisfied the current version. However, if circumstances warrant changing the Plan then the new Template should be used.

Waiver exemption: None.

X. Performance Objectives and Measurements

Objective 1: All NOAA Observing Systems of Record¹⁵ (as defined by NOAA Observing Systems Committee) have a data management plan.

Metric 1: Percent of Observing Systems of Record for which a DM Plan has been submitted to the DM Plan Repository.

Objective 2: All NOAA environmental observations and model outputs (unless exempted pursuant to Section IX) are covered by a data management plan.

Metric 2: Number of additional observing systems and models (beyond Systems of Record) for which a

¹⁵ <https://www.nosc.noaa.gov/OSC/oss.php>

DM Plan has been submitted.

XI. Definitions

Terminology from NAO 212-15:

Environmental data: Recorded and derived observations and measurements of the physical, chemical, biological, geological, and geophysical properties and conditions of the oceans, atmosphere, space environment, sun, and solid earth, as well as correlative data such as socio-economic data, related documentation, and metadata. Numerical model outputs are included in this definition. Digital audio or video recordings of environmental phenomena (such as animal sounds or undersea video) are included in this definition.

Data Management: A combination of two major activities conducted in coordination, data management services and data stewardship, which together constitute a comprehensive end-to-end process including movement of data and information from the observing system sensors to the data user. This process includes the acquisition, quality control, metadata cataloging, validation, reprocessing, storage, retrieval, dissemination, and archival of data.

Data Stewards: individuals who are responsible for establishing, maintaining, and being accountable for the quality, integrity, documentation, and preservation of environmental data under their purview.

Abbreviations:

DM Plan: Data Management Plan.

EDMC: NOAA Environmental Data Management Committee.

LO: NOAA Line Office.

NAO: NOAA Administrative Order.

NCDC: National Climatic Data Center.

NGDC: National Geophysical Data Center.

NODC: National Oceanographic Data Center.

OSC: NOAA Observing Systems Committee.

OSTP: White House Office of Science and Technology Policy.

SO: NOAA Staff Office.

TPIO: Technology Planning and Integration for Observations program.

URL: Uniform Resource Locator.

XII. Frequently Asked Questions (FAQs)

Questions about this Directive may be sent to noaa.data.dmp@noaa.gov .

Answers will be posted on the NOAA Environmental Data Management Wiki site at

https://geo-ide.noaa.gov/wiki/index.php?title=Data_Management_Planning_PD .

XIII. Approval

This Directive (version 2.0) was approved on 2014 Dec 10 by the NOAA Environmental Data Management Committee.

A minor revision (v.2.0.1) was approved on 2015 Feb 11 by EDMC, with the following changes:

- Clarified that textual warning and advisory messages are not included in the scope (§II).
- Defined approach for reporting DM Plans not completed within 1-year timeline (§VIII).
- Added new organizational name National Centers for Environmental Information.
- Removed duplicate footnote.

Dr. Jeff de La Beaujardière, EDMC Chair

XIV. Appendices

Appendix A: Data Management Plan Template

Please provide the following information, and submit to the NOAA DM Plan Repository.¹²

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:
- 1.2. Summary description of the data:
- 1.3. Is this a one-time data collection, or an ongoing series of measurements?
- 1.4. Actual or planned temporal coverage of the data:
- 1.5. Actual or planned geographic coverage of the data:
- 1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
- 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,¹⁵ 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:
- 2.2. Title:
- 2.3. Affiliation or facility:
- 2.4. E-mail address:
- 2.5. Phone number:

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:
- 3.2. Position Title:

3.3. Name of current Position holder:

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?

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

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines¹⁶ 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*):

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*):

6. Data Documentation

The EDMC Data Documentation Procedural Directive¹⁷ 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?

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

6.2. Name of organization or facility providing metadata hosting:

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

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

6.4. Process for producing and maintaining metadata (*describe or provide URL of description*):

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 Directive¹⁸ 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?

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?

7.1.2. If there are limitations to public data access, describe how data are protected from

¹⁶ http://www.cio.noaa.gov/services_programs/IQ_Guidelines_030414.html

¹⁷ <https://www.nosc.noaa.gov/EDMC/PD.DD.php>

¹⁸ Data Access Directive currently in review; URL to be added.

unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:

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

7.2.2. URL of data access service, if known:

7.3. Data access methods or services offered:

7.4. Approximate delay between data collection and dissemination:

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

8. **Data Preservation and Protection**

The NOAA Procedure for Scientific Records Appraisal and Archive Approval¹⁴ 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 NODC, NCDC, NGDC, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

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):

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

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:

9. **Additional Line Office or Staff Office Questions**

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