



NOAA/NESDIS



NESDIS ENVIRONMENTAL DATA MANAGEMENT PLANNING POLICY February 2017

COMPLIANCE IS MANDATORY



Prepared by:

U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Environmental Satellite, Data, and Information Service (NESDIS)



**NESDIS
Policy
Directive**

NPD 6010.01A

Effective Date: February 10, 2017
Expiration Date: February 10, 2022

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Approval Page

Document Number: NPD 6010.01A	
Document Title Block: NOAA/NESDIS Environmental Data Management Planning Policy	
Process Owner: Helen M. Wood (OSAAP)	Document Release Date: February 1, 2017

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1 February 2017

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1 FEBRUARY 2017

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15 Feb 2017

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Document Change Record

VERSION	DATE	CCR #	SECTIONS AFFECTED	DESCRIPTION
NPQ 8001	July 2015	----	ALL	Baseline NQP-EDM-8001
NPR 9543	October 2016	--	Selected	Response to comments from OSGS, NCEI & ACIO; typos, corrections.
NPD 6010.01A	January 2017	--	Selected	Response to comments from 12/16 review.



**NESDIS
Environmental Data Management Planning Policy**

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NOAA Satellite and Information Service NESDIS Environmental Data Management Planning Policy

1. Purpose:

The purpose of this document is to define requirements for the management of data and information generated by NESDIS Observing Systems and associated Data Management Systems, and thereby ensure that NESDIS Environmental Data are properly planned and supported throughout their lifecycle.

This policy supports NOAA Administrative Order (NAO) 212-15, *Management of Environmental Data and Information*,¹ which provides high-level direction that guides procedures, decisions, and actions regarding environmental data and information management throughout NOAA. The *NOAA Environmental Data Management Framework* and *NOAA Environmental Data Management Procedural Directives* issued by the NOAA Environmental Data Management Committee (EDMC) provide additional guidance and direction.

2. Applicability:

This Policy applies to all Environmental Data produced by NESDIS Observing and associated Data Management Systems, and to the personnel and organizations that plan, produce, and manage these data and systems.

3. Definitions:

1. Environmental Data: *NAO 212-15* defines environmental data as "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 socioeconomic data, related documentation, algorithm source code, and metadata." The terms "data" and "environmental data" may be used interchangeably in this Policy.
2. Archive: An organization or facility (also referred to as a NOAA Archive or NOAA Facility) of people and systems that has accepted the responsibility to preserve information according to NARA standards and make it available for a designated community.² The NOAA National

¹ See §7 References for document locations.

² *NOAA Procedure for Scientific Records Appraisal and Archive Approval (2008)*



Center for Environmental Information (NCEI) constitutes the official NOAA archive. NCEI maintains, processes, distributes, and provides long-term stewardship for most of NOAA's environmental and geospatial data, and provides a broad range of user services.³ NCEI is operated by NESDIS but performs data preservation and stewardship on behalf of the entire agency.

3. Archival Functions: The full range of archival information preservation functions defined in the *Open Archival Information Systems Reference Model (ISO 14721:2012)*, namely Ingest, Archival Storage, Access, Data Management, Preservation Planning, Administration, and Data Stewardship.
4. Archive System: The information technology systems that enable the Archive. NCEI operates the Archive System for NESDIS. The responsibility for planning, developing, operating or maintaining information technology systems that support the Archive may be assigned to other organizations within NESDIS.
5. Data Management: *NAO 212-15* states that Data Management consists of data management services and data stewardship, conducted in coordination. These constitute a comprehensive end-to-end process including movement of data and information from the Observing System to the data users. This process includes the acquisition (including command and control), ground data processing, quality control, metadata creation and cataloging, validation, reprocessing, storage, retrieval, dissemination, and depositing data in a long-term archival stewardship system.
6. Data Management System: The information technology systems that enable Data Management.
7. Data Lifecycle: Consistent with *NAO 212-15* and the *NOAA Environmental Data Management Framework*, this includes all the activities that affect data and related metadata before and during their lifetime. The term "lifecycle" includes long-term preservation and is not meant to imply a finite lifetime or limited period of usefulness. Lifecycle activities are divided into three groups: *Planning and Production*, which includes all activities up to and including the moment that an observation is captured by an observing system or data collection project; *Data Management*, which includes all activities related to processing, verifying, documenting, advertising, distributing and preserving data; and *Usage*, which includes all activities performed by the consumer of the data (these activities are often outside the direct control of data managers).
8. Data Producers: The program managers responsible for the planning, development, and operation of all data production or data collection systems. NESDIS Data Producers may include NESDIS observing system developers, ground systems developers and operators, researchers and long-term data stewards.

³ NOAA *Environmental Data Management Framework*



9. Data Stewardship: *NAO 212-15* defines Data Stewardship as a subset of Data Management which consists of the application of rigorous analyses and oversight to ensure that data sets meet the needs of users. This includes documenting measurement practices and processing practices (metadata); providing feedback on observing system performance; inter-comparison of data sets for validation; reprocessing (incorporate new data, apply new algorithms, perform bias corrections, integrate/blend data sets from different sources or observing systems); and recommending corrective action for errant or non-optimal operations.
10. Observing System: As defined in the *NOAA Environmental Data Management Framework*, an observing system is a set of one or more platforms (such as a satellite, buoy, radar, fixed instrument platform, ship, airplane, or autonomous vehicle), each containing one or more sensors.
11. Original Data: As defined in the *NOAA Information Quality Guidelines (2006)*, Original Data are scientific records in their most basic useful form, also referred to as “raw” or minimally processed, quality controlled, or calibrated. For NESDIS environmental satellite systems, data processing *Levels 0, 1a*, or equivalent meet this definition. Note: *Level 0* data are fully recoverable from *Level 1a* data.

4. Policy:

1. NESDIS will ensure the long-term preservation of Environmental Data from NESDIS Data Producers and their associated Data Management Systems in accordance with *NAO 212-15*.
2. NESDIS will ensure, at minimum, that Original Data from its Data Producers and associated Data Management Systems will be archived.
3. NESDIS will determine the cost effectiveness of on-demand regeneration of products derived from Environmental Data vs. long-term preservation of the derived products.
4. NESDIS will ensure that required Data Management Plans are written, reviewed, submitted to EDMC, followed throughout the Data Lifecycle, and revised as circumstances warrant, pursuant to the *NOAA Data Management Planning Procedural Directive*.
5. NESDIS and Data Producers will ensure that the Archive is involved throughout the concept, design, development, and operations phases of NESDIS Observing Systems and associated Data Management Systems.
6. NESDIS, to the maximum extent possible, will ensure that all data, relevant metadata, and derived products are archived, unless an explicit decision not to archive has been made pursuant to the *NOAA Procedure for Scientific Records Appraisal and Archive Approval*.



7. NESDIS will include the review of the Archive System in lifecycle reviews of Data Processing Systems associated with the development of new Observing Systems.
8. NESDIS will provide sufficient development, operations, and maintenance resources to support Archive functions and Archive Systems for NESDIS Data Producers and associated Data Management Systems, pursuant to the *NOAA Environmental Data Management Framework*.
9. NESDIS, to the maximum extent possible, will ensure that all its data are publicly discoverable and accessible, pursuant to the *NOAA Data Access Procedural Directive*.
10. NESDIS Data Producers and associated Data Management Systems will employ applicable standards, conceptual models, methodologies, and terminology that adhere to accepted Federal and international standards for data storage, accessibility, metadata, interoperability, and long-term preservation.
11. NESDIS will adopt an acquisitions strategy for NESDIS Observing Systems and associated Data Management Systems that, to the maximum extent possible, secures all necessary rights and provisions for the data to be archived and used in a free and open manner by NOAA and NOAA external customers. This applies to capabilities acquired from all sources.
12. Any exception to these requirements requires approval by the NESDIS Assistant Administrator, in consultation with the NOAA Observing Systems Council where required.

5. Roles and Responsibilities:

1. NESDIS Assistant Administrator is responsible for policy compliance, approving waivers, and allocating sufficient resources for implementation, including the development, operation and maintenance of the Archive and associated Archive System.
2. NESDIS Data Producers are responsible for complying with this policy and all applicable NOAA Environmental Data Management Policies and Procedural Directives.
3. NESDIS Data Producers are responsible for developing, coordinating and implementing Data Management Plans consistent with this policy and in compliance with the *NOAA Data Management Planning Procedural Directive*.
4. NESDIS Data Producers are responsible for negotiating with NCEI the representation of data that need to be preserved and stewarded for the long-term, pursuant to the *NOAA Environmental Data Management Framework*.



5. NESDIS Data Producers are responsible for submitting Data Management Plans to the NESDIS Information Resource Management Advisory Committee (IRMAC) for review and approval, prior to submitting IT procurements.
6. NESDIS IRMAC is responsible for reviewing Data Management Plans prior to approving IT procurements and advising the NESDIS AA on all requests for waivers to this Policy.
7. NESDIS IRMAC may establish specific review and approval procedures, including a threshold below which Data Management Plans are not required.
8. NESDIS Office of System Architecture and Advanced Planning (OSAAP) is responsible for certifying that requirements for NESDIS Data Producers and associated Environmental Data Management Systems are validated.
9. NCEI is responsible for all Archival functions. NCEI is responsible for appraising and approving Archive Requests; coordinating Submission Agreements with Data Producers; developing Archive System requirements; and managing the data contained within the Archive System. Actual implementation may divide functionality across multiple organizations to fully support all Archival Functions.
10. NESDIS Assistant Chief Information Officer for Satellites (ACIO-S) may provide additional guidance on the conduct of Environmental Data Management within NESDIS.
11. NOAA EDMC maintains the Data Management Plan Repository.
12. OSAAP is responsible for the development and maintenance of this Policy in collaboration with NESDIS internal stakeholders. Any changes to the Policy will be formally controlled and incorporated into this document by OSAAP.

6. Effect and Procedures:

1. NESDIS Observing Systems and their associated Data Management Systems, including Archive System components in place or under development at the time of approval of this Policy, will continue to be developed and operated as planned.
2. Incomplete Data Management Plans for current NESDIS Observing Systems and their associated Data Management Systems that are under development at the time of approval of this Policy will be completed to include Archive and Stewardship requirements, Archive Appraisal, and a Submission Agreement. The updated Data Management Plans will be provided to EDMC as documentation of current practice.
3. New observing systems shall have Data Management Plans approved and submitted to the EDMC as required by this policy and applicable NOAA directives.



4. Other NESDIS procedures and requirements documents in place at the time of approval of this Policy will be reviewed and revised as needed to be consistent with this Policy.

7. Reference Documents:

The NOAA Office of the Chief Information Officer (OCIO) maintains a list of applicable authorities and references and will provide access to their electronic editions. Additional directives and reference materials are available through the NOAA Environmental Data Management Committee. The following items are some of the primary reference materials related to this Policy.

NOAA Administrative Order (NAO) 212-15, Management of Environmental Data and Information (2010) Establishes environmental data management policy for NOAA and provides high-level guidance for procedures, decisions and actions regarding EDM. It requires that environmental data be managed based upon a lifecycle that includes developing and following a Data Management Plan (DM Plan).

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

NOAA Environmental Data Management Framework (2013) Defines and categorizes the policies, requirements, activities, and technical considerations relevant to the management of observational data and derived products at NOAA. It states that observations should be managed as agency and national assets, preserved for future use, and protected from unintended or malicious modification. Data should not only be preserved in their original form but should be actively stewarded to ensure continuing usability.

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

NOAA Procedure for Scientific Records Appraisal and Archive Approval (2008)

Defines the process used to identify and appraise scientific records for NOAA archiving.

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

NOAA Data Management Planning Procedural Directive (2014)

This Directive requires managers of all data production or data collection programs and systems to ensure data management plans are developed for their data. It provides a Template with questions to be addressed regarding NOAA environmental data.

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

NOAA Data Access Procedural Directive (2015)

This Directive requires managers of all data production or data collection programs and systems to ensure their data are publicly discoverable and accessible, unless a waiver has been approved by the Line Office Assistant Administrator or designee.

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



NOAA Information Quality Guidelines (2006)

These guidelines are intended to ensure and maximize the quality, objectivity, utility, and integrity of information which NOAA disseminates. The report groups NOAA's data, information, and products into seven broad categories, five of which, per the National Research Council, are relevant to archived data: (1) Original Data; (2) Synthesized Products; (3) Interpreted Products; (4) Hydrometeorological, Hazardous Chemical Spill, and Space Weather Warnings, Forecasts, and Advisories; and (5) Experimental Products.

http://www.cio.noaa.gov/services_programs/info_quality.html

National Science and Technology Council, "National Plan for Civil Earth Observations" (2014)

The plan includes a comprehensive data management framework to promote improved discoverability, accessibility, and usability of Earth observation data.

http://www.whitehouse.gov/sites/default/files/microsites/ostp/NSTC/national_plan_for_civil_earth_observations_-_july_2014.pdf

National Research Council, "Environmental Data Management at NOAA: Archiving, Stewardship and Access" (2007)

The report presents a series of high-level principles that are essential for effective environmental data management. It provides guidance for determining which data sets to retain and provide access to, and a foundation on which to build a comprehensive data management plan.

http://www.nap.edu/catalog.php?record_id=12017

Consultative Committee for Space Data Systems, Reference Model for an Open Archival Information System (OAIS), Recommendation for Space Data System Practices, CCSDS 650.0-M-2, Magenta Book, Issue 2. Washington, D.C.: CCSDS, June 2012. [Equivalent to ISO 14721:2012].

<http://public.ccsds.org/publications/archive/650x0m2.pdf>

OMB Memorandum on "Managing Government Information as an Asset throughout its Life Cycle to Promote Interoperability and Openness," M-13-13 (2011)

Pursuant to Executive Order of May 9, 2013, *Making Open and Machine Readable the New Default for Government Information*, this Memorandum establishes a framework to help institutionalize the principles of effective information management at each stage of the information's life cycle to promote interoperability and openness.

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