



Data and Publication Sharing Directive for NOAA Grants, Cooperative Agreements, and Contracts

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I. Background and Purpose

The White House Office of Science and Technology Policy (OSTP) issued a Memorandum on Feb. 22, 2013 entitled *Increasing Access to the Results of Federally Funded Research*¹ directing each Federal agency that conducts over \$100 million annually in research and development expenditures to develop a plan to support increased public access to the results of that research. In response to the OSTP Memorandum, the NOAA Research Council issued the *NOAA Plan for Increasing Public Access to Research Results*² (PARR) in February 2015. Among other requirements, the NOAA PARR Plan instructs the NOAA Environmental Data Management Committee (EDMC) to revise its existing *NOAA Data Sharing Policy for Grants and Cooperative Agreements*³; this document (version 3.0) is the revised directive and supersedes the previous version (2.0). "Data sharing" means making data publicly visible and accessible in a timely manner at no cost (or no more than the cost of reproduction), in a format which is machine-readable⁴ and based on open standards,⁵ along with metadata⁶ necessary to find and properly use the data.

This Directive specifies requirements for NOAA Programs that issue grants, cooperative agreements, or contracts.⁷ In particular, NOAA Programs are required to consider, in advance, how to ensure public accessibility and long-term preservation of externally-funded data, to provide guidance for proposers to use in developing a plan for data access, and to track and enforce conditions imposed on awardees. Appendix B of this Directive provides text to be included in Federal Funding Opportunity (FFO) Announcements and Contract Solicitations, and in Notices of Award and Contracts.

II. Scope

1. For the purposes of this NOAA Directive, **research results** are defined as **environmental data** and **peer-reviewed publications**.
2. This Directive applies to **NOAA programs that** issue grants, cooperative agreements, or contracts to **fund the production of environmental data or peer-reviewed publications**. The directive applies whether or not a specific grant is classified as a "research award." Awards that do not fund the production of such research results are not subject to this Directive (see Appendix B.2).

¹ https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

² <http://doi.org/10.7289/V5F47M2H>

³ <https://nosc.noaa.gov/EDMC/PD.DSP.php>

⁴ Machine readable means the data are stored on a computer in a digital format whose structure is well described and which can be read without the aid of a human (as opposed, for example, to data on paper in filing cabinets, or scanned images of handwritten numbers).

⁵ An open-standard format is one which does not require proprietary software to be read.

⁶ Metadata is documentation that is machine-readable and structured according to an open-standard format and which describes the data so that users can search for, access, read, understand, and use the data.

⁷ As defined by Public Law 95-224 - Federal Grant and Cooperative Agreement Act (<http://www.grants.gov/web/grants/learn-grants/grant-policies/federal-grant-cooperative-agreement-act-1977.html>)

3. **Environmental Data** are defined by NOAA Administrative Order (NAO) 212–15: *Management of Environmental Data and Information*⁸ 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 socio-economic data,⁹ related documentation, and metadata. Digital audio or video recordings of environmental phenomena (such as animal sounds or undersea video) are included in this definition. Numerical model outputs¹⁰ are included in this definition, particularly if they are used to support the conclusion of a peer-reviewed publication. Data collected in a laboratory or other controlled environment, such as measurements of animals and chemical processes, are included in this definition.
4. In this Directive the word "**data**" used alone refers specifically to **environmental data**.
5. **Sharing data** means making data publicly visible and accessible in a timely manner at no cost (or no more than the cost of reproduction), in a format which is machine-readable and based on open standards, along with metadata necessary to find and properly use the data.
6. **Timely** means no later than publication of a peer-reviewed article based on the data, or two years after the data are collected and verified, or two years after the original end date of the grant (not including any extensions or follow-on funding), whichever is soonest, unless a delay has been authorized by the NOAA funding program.
7. The data accessibility requirements of this Directive apply to **new** data created by **extramural** funding recipients. Data produced **internally** by NOAA, or by as part of collaborative research between NOAA and an extramural funding recipient, are instead subject to the *NOAA Data Access Directive*.¹¹
8. The text in Appendix B.1, when included in FFO Announcements or Contract Solicitations, applies to **submitters of proposals to NOAA** for work expected to produce environmental data or peer-reviewed publications.
9. The text in Appendix B.3, when included in Notices of Award or Contracts, applies to **recipients of NOAA grants, cooperative agreements, or contracts** which are anticipated to produce environmental data or peer-reviewed publications. Recipients are responsible for implementing these conditions are also met by sub-recipients and subcontractors.
10. This Directive does not apply to "laboratory notebooks, preliminary analyses, drafts of scientific papers, plans for future research, peer review reports, communications with colleagues, or physical objects, such as laboratory specimens" (per OSTP Memorandum¹).

III. Authority

Governance documents applicable to this directive include:

- OSTP Memorandum *Increasing Access to the Results of Federally Funded Research*¹
- NOAA *Plan for Increasing Public Access to Research Results*²
- Public Law 95-224 - Federal Grant and Cooperative Agreement Act
<http://www.grants.gov/web/grants/learn-grants/grant-policies/federal-grant-cooperative-agreement->

⁸ http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_212/212-15.html

⁹ Personally-identifiable information regarding human subjects must be properly protected or removed.

¹⁰ That is, the data produced by computer simulations of environmental processes.

¹¹ <https://nosc.noaa.gov/EDMC/PD.DA.php>

- [act-1977.html](#))⁷
- US Open Data Policy (2013 May 9 Executive Order¹² and OMB Memorandum M-13-13¹³)
- NOAA Administrative Order (NAO) 212-15: *Management of Environmental Data and Information*⁶
- NAO 205-17A: *Information Access & Dissemination*¹⁴

IV. Directive

1. NOAA Programs shall strive to ensure that environmental data produced as a result of NOAA-funded Grants, Cooperative Agreements, or Contracts are made publicly accessible, in a timely fashion (typically within 2 years), free of charge or at no more than the cost of reproduction, and that any exceptions or extensions are explicitly justified on a case-by-case basis.¹⁵
 - 1.1. Prior to issuing an FFO Announcement or Grant Solicitation, the Program shall develop Data Management Guidance (DM Guidance) describing in general terms how the Program intends for the resulting data to be managed by the grantee and what, if any, NOAA support (such as archiving at NCEI) may be provided.
 - 1.1.1. The DM Guidance shall be based on the Template in Appendix A below, but may be tailored to fit the needs of the Program.¹⁶
 - 1.1.2. The DM Guidance shall be included or referenced in the FFO Announcement or Contract Solicitation, in order to assist proposal submitters preparing Data Management Plans.
 - 1.2. During development of the DM Guidance, programs that plan to fund the production of data shall consult with NOAA National Centers for Environmental Information (NCEI)¹⁷ regarding the feasibility and potential costs for archiving the data at NCEI and to enable NCEI to reach a preliminary understanding of potential capacity, resource, or technical issues.
 - 1.3. Approved submission of data to NCEI, or to a publicly-accessible data repository approved by the funding program, shall be sufficient to satisfy the data accessibility requirement as of the date the submission was performed.
2. NOAA Programs shall ensure submitters of proposals and recipients of NOAA funding are aware of their role in satisfying the requirements of this Directive.
 - 2.1. The text in Appendix B.1 shall be included in all FFO Announcements and Contract Solicitations anticipated to produce data in order to ask for Data Management Plans in proposals and to advise proposers of these requirements if funded.
 - 2.2. The text in Appendix B.2 shall be included in all Announcements and Solicitations not anticipated to produce data.
 - 2.3. The text in Appendix B.3 shall be included in all Notices of Award and Contracts anticipated to produce data in order to require recipients of Grants, Cooperative Agreements, or Contracts to

¹² [http://www.whitehouse.gov/the-press-office/2013/05/09/executive-order-making-open-and-machine-readable-new-default-government-](http://www.whitehouse.gov/the-press-office/2013/05/09/executive-order-making-open-and-machine-readable-new-default-government)

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

¹⁴ http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_205/205-17.html

¹⁵ Data sharing could be limited by law, regulation, policy, security requirements, commercial or international agreements, or valid technical considerations.

¹⁶ This is a simplified version of the DM Plan template found in the *NOAA Data Management Planning Procedural Directive* (<https://www.nosc.noaa.gov/EDMC/PD.DMP.php>), which applies to NOAA internally-produced data.

¹⁷ <https://www.ncei.noaa.gov/>

- share data, submit manuscripts, cite data used in publications, and report funding sources using FundRef.¹⁸
3. NOAA Programs shall verify compliance by proposers and recipients of funding with the terms expressed in Appendix B. See metrics to be reported in Section X.
 - 3.1. Data Management Plans shall be evaluated as part of the proposal review process; proposal submitters and reviewers shall be informed of this evaluation criterion.
 - 3.2. Data accessibility shall be confirmed, during or before the close-out phase if possible, by (a) verifying that an online link for data access was reported by the funding recipient and (b) checking such links to confirm the presence of expected data.
 - 3.3. NOAA Programs shall have flexibility to authorize exceptions or delays to data accessibility on a case-by-case basis with valid justification; these instances shall be reported to EDMC.
 - 3.4. Submission of manuscripts to the NOAA Institutional Repository shall be confirmed, either as part of normal reporting by the Repository or by Programs querying the Repository to verify the existence of manuscripts.
 - 3.5. Metrics defined in Section X shall be gathered and reported to EDMC at least annually, and may be reported publicly by EDMC.
 - 3.6. Past performance regarding data sharing and manuscript submission shall be considered when reviewing new awards. NOAA Programs may provide specific instructions to reviewers about how to consider and quantify past performance in data sharing and manuscript submission during the proposal review process.
 - 3.7. NOAA programs may use existing legal methods (e.g., as defined in the Department of Commerce Grants and Cooperative Agreements Manual) in the case of non-compliance by grantees.
 4. NOAA Central Library shall ensure that all submitted pre-publication manuscripts produced with NOAA funding are made publicly accessible, free of charge, after an embargo period of not more than one year.
 - 4.1. NOAA Central Library shall establish and maintain an Institutional Repository for manuscripts, as described in the NOAA Public Access Policy for Scholarly Publications.¹⁹
 - 4.2. NOAA Central Library shall, at least annually, verify that it has the manuscripts of all NOAA-funded publications reported by FundRef.

V. Responsibilities

Responsible entities include:

- NOAA Programs that fund Grants, Cooperative Agreements, and Contracts to produce environmental data or peer-reviewed publications: Plan for and verify accessibility of data and submission of publication manuscripts to NOAA Institutional Repository (§IV.1-IV.3); ensure that any exemptions or delays to data access are reasonable and justified; report metrics (Sec. X) to EDMC.
- NOAA Central Library: Maintain NOAA Institutional Repository and ensure public accessibility of

¹⁸ FundRef provides a standard way to report funding sources for published scholarly research. See <http://www.crossref.org/fundref/>. If FundRef is supported by the publisher, the names of funding programs are gathered at the time an article is submitted for publication.

¹⁹ <http://library.noaa.gov/repository>

manuscripts after embargo (§IV.4); report metrics (Sec. X) to EDMC.

- EDMC: track compliance by proposal submitters and recipients of Grants, Cooperative Agreements, and Contracts; support implementation, tracking, and maintenance of this Directive (§VI).
- NCEI: Ensure long-term preservation of accepted data submissions, and provide catalog registration and public access of archival datasets.

VI. Management and Ownership

This Procedural Directive is issued and managed by the NOAA Environmental Data Management Committee. The Directive and its Appendices will be reviewed at least every three years, and revised as needed, by the EDMC or a designated work team.

VII. Intended Audience

The audience for this Directive is primarily NOAA Programs that provide funding for Grants, Cooperative Agreements, or Contracts, as well as the NOAA Acquisition and Grants Office. The text in Appendix B, for inclusion in FFO Announcements, Contract Solicitations, Notices of Award, and Contracts, is the sole text applicable to external investigators or contractors for the purposes of this Directive.

VIII. Implementation Date

This directive will become applicable to NOAA Programs on **2016 March 1**. NOAA Programs will have 90 days to develop Data Management Guidance (Appendix A.1) for new FFO Announcements and Contract Solicitations.

This directive will become applicable to all FFO Announcements and Contract Solicitations issued on or after **2016 June 1**.

IX. Grandfather Exemption and Waiver Option

Grandfather exemption: This Directive does not apply to FFO Announcements and Contract Solicitations published before 2016 June 1, or to Grants, Cooperative Agreements, and Contracts funded as a result of Announcements published before that date. The previous version of this directive³ applies to earlier grants.

Waiver Option: Data accessibility may be waived or delayed, if necessary, by negotiation with funding recipients on a case-by-case basis. Grant Programs must report such waivers to EDMC at least annually.

X. Performance Objectives and Measurements

The following metrics are to be compiled by Programs (#1, 2) and NOAA Central Library (#3, 4, 5) and reported annually to EDMC:

1. Number of proposals received to produce data, and how many of those included a Data Management Plan. Objective: 100% of relevant proposals include Data Management Plan.
2. Number of funded data-producing awards, and how many of those made NOAA-funded data

accessible as required, and how many received exceptions or extensions to the requirements for timely data accessibility, and how many were not able to be verified. Objective: 100% of funded proposals verifiably share data in a timely fashion.

3. Number of manuscripts submitted by funding recipients to NOAA Institutional Repository. Objective: 100% or relevant manuscripts are submitted.
4. Number of submitted manuscripts that acknowledged support using FundRef. Objective: 100%.
5. Number of submitted manuscripts that explicitly cited datasets used to support conclusions of the paper. Objective: 100%.

XI. Definitions and Abbreviations

AGO: Acquisition and Grants Office

EDMC: Environmental Data Management Committee

FFO: Federal Funding Opportunity

NCEI: National Centers for Environmental Information

OSTP: Office of Science and Technology Policy

PARR: Public Access to Research Results

XII. Approval

This directive was approved on 2016 Feb 10 by the NOAA Environmental Data Management Committee, after NOAA-wide review including NOAA Research Council, NOAA Library, NOAA Acquisition and Grants office, NOAA Observing Systems Council, and NOAA Chief Information Officer Council, and DOC Office of General Counsel.

XIII. Frequently Asked Questions (FAQs)

The FAQ for this directive may be found on the NOAA Environmental Data Management Wiki at https://geo-ide.noaa.gov/wiki/index.php?title=FAQ_for_Data_Sharing_for_NOAA_Grants_PD.

XIV. Appendices

Appendix A: Data Management Guidance Template for NOAA Funding Programs

High-level Data Management Guidance (DM Guidance) based on the template below shall be produced by NOAA Programs seeking to award Grants, Cooperative Agreements, or Contracts anticipated to result in the production of environmental data. Programs may tailor the guidance to suit their needs. The DM Guidance shall be included or referenced in the NOAA FFO Announcement or Contract Solicitation. The same Guidance may be used for multiple Announcements or Solicitations as long as the Guidance is applicable to each one.

NOTE: If the scope of the Announcement or Solicitation does not permit the creation of data, then this Directive does not apply and this DM Guidance is not required. Instead, include the text in Appendix B.2 in your Announcement. This directive does apply to Broad Agency Announcements (BAA), which may yield proposals to create to data.

Data Management Guidance to Proposal Writers

1. **Responsible NOAA Official** for questions regarding this guidance and for verifying accessibility of data produced by funding recipients:
 - Name:
 - Title:
 - Affiliation or facility:
 - E-mail address:
 - Phone number:
2. **Data Accessibility:** The NOAA Program recommends (or requires) that public access to grant/contract-produced data be enabled as follows (*one or more of the following, or alternate text as appropriate, can be provided as guidance; Data Management Plans submitted with Proposals should reflect the option(s) provided by the Program*)
 - Funding recipients are expected to submit data to NOAA National Centers for Environmental Information (NCEI), which will provide public access and permanent archiving.
 - The NOAA Program has held preliminary consultation with NCEI regarding these pending data.
 - Data are to be submitted to the following International Council for Science (ICSU) World Data System facility: _____.
(see list at <https://www.icsu-wds.org/community/membership/regular-members>)
 - The following NOAA facility (*other than NCEI*) will operate a publicly accessible online data server for these data: _____.
 - An existing publicly accessible online data server at the funded institution is to be used to host these data (describe in proposal).
 - Data are to be submitted to a public data repository appropriate to this scientific domain (describe in proposal). (Options could include Dryad - <http://datadryad.org/>), Figshare - <http://figshare.com/>, DataVerse - <http://dataverse.org/>), Pangaea - <http://www.pangaea.de/>), Acadis (for Arctic data) - <https://www.aoncadis.org/>, Merritt (for University of California) - <https://merritt.cdlib.org/>, or others.)
 - Funding recipients will establish their own data hosting capability (describe in proposal).

- Proposal may request permission not to make data publicly accessible (proposal to explain rationale for lack of public access, and if funded to obtain approval from Responsible NOAA Official listed above).
- 3. **Technical recommendations** (*one or more of the following, or alternate text as appropriate, can be provided as additional guidance; Data Management Plans submitted with Proposals should reflect the option(s) provided by the Program*)
 - The NOAA Program recommends (or requires) the following data format(s), data access method(s), or other technical guidance: _____.
 - The NOAA Program is not offering specific technical guidance. Proposals are to describe their proposed approach. Use of open-standard formats and methods is encouraged.
- 4. **Resources** (*NOTE: NCEI may charge a fee for archiving, particularly for large or unusual datasets; NOAA Programs are advised to contact NCEI in advance*)
 - Proposals are permitted to include the costs of data sharing or archiving in their budgets.
 - NOAA Program resources for data sharing or archiving have already been identified; proposals should not include such costs.
 - Proposals may include such costs if data volume is expected to exceed _____.

Appendix B: Text to be included in Announcements and Awards

The following text is for inclusion in FFO Announcements and Contract Solicitations (Appendix B.1, B.2) and Notices of Award and Contracts (Appendix B.3).

B.1. Text to be included in FFO Announcements and Contract Solicitations for projects that may generate environmental data (including Broad Agency Announcements)

1. Environmental data and information collected or created under NOAA grants or cooperative agreements must be made discoverable by and accessible to the general public, in a timely fashion (typically within two years), free of charge or at no more than the cost of reproduction, unless an exemption is granted by the NOAA Program. Data should be available in at least one machine-readable format, preferably a widely-used or open-standard format, and should also be accompanied by machine-readable documentation (metadata), preferably based on widely-used or international standards.
2. Proposals submitted in response to this Announcement must include a Data Management Plan of up to two pages describing how these requirements will be satisfied. The Data Management Plan should be aligned with the Data Management Guidance provided by NOAA in the Announcement. The contents of the Data Management Plan (or absence thereof), and past performance regarding such plans, will be considered as part of proposal review. A typical plan should include descriptions of the types of environmental data and information expected to be created during the course of the project; the tentative date by which data will be shared; the standards to be used for data/metadata format and content; methods for providing data access; approximate total volume of data to be collected; and prior experience in making such data accessible. The costs of data preparation, accessibility, or archiving may be included in the proposal budget unless otherwise stated in the Guidance. Accepted submission of data to the NOAA National Centers for Environmental Information (NCEI) is one way to satisfy data sharing requirements; however, NCEI is not obligated to accept all submissions and may charge a fee, particularly for large or unusual datasets.
3. NOAA may, at its own discretion, make publicly visible the Data Management Plan from funded proposals, or use information from the Data Management Plan to produce a formal metadata record and include that metadata in a Catalog to indicate the pending availability of new data.
4. Proposal submitters are hereby advised that the final pre-publication manuscripts of scholarly articles produced entirely or primarily with NOAA funding will be required to be submitted to NOAA Institutional Repository after acceptance, and no later than upon publication. Such manuscripts shall be made publicly available by NOAA one year after publication by the journal.

B.2. Text to be included in Announcements and Solicitations for projects NOT expected to generate environmental data

This announcement is not seeking proposals that generate environmental data. Therefore, a Data Management Plan is not required as part of the Proposal.

B.3. Text to be included in Notices of Award and Contracts of projects anticipated to generate environmental data or peer-reviewed publications

Special Award Conditions:

1. **Data Sharing:** Environmental data collected or created under this Grant, Cooperative Agreement, or Contract must be made publicly visible and accessible in a timely manner, free of charge or at minimal cost that is no more than the cost of distribution to the user, except where limited by law, regulation, policy, or national security requirements. Data are to be made available in a form that would permit further analysis or reuse: data must be encoded in a machine-readable format, preferably using existing open format standards; data must be sufficiently documented, preferably using open metadata standards, to enable users to independently read and understand the data. The location (internet address) of the data should be included in the final report. Pursuant to NOAA Information Quality Guidelines,²⁰ data should undergo quality control (QC) and a description of the QC process and results should be referenced in the metadata.^{21,22}
2. **Timeliness:** Data accessibility must occur no later than publication of a peer-reviewed article based on the data, or two years after the data are collected and verified, or two years after the original end date of the grant (not including any extensions or follow-on funding), whichever is soonest, unless a delay has been authorized by the NOAA funding program.
3. **Disclaimer:** Data produced under this award and made available to the public must be accompanied by the following statement: "These data and related items of information have not been formally disseminated by NOAA, and do not represent any agency determination, view, or policy."
4. **Failure to Share Data:** Failing or delaying to make environmental data accessible in accordance with the submitted Data Management Plan, unless authorized by the NOAA Program, may lead to enforcement actions, and will be considered by NOAA when making future award decisions. Funding recipients are responsible for ensuring these conditions are also met by sub-recipients and subcontractors.
5. **Funding acknowledgement:** Federal funding sources shall be identified in all scholarly publications. An Acknowledgements section shall be included in the body of the publication stating the relevant Grant Programs and Award Numbers. In addition, funding sources shall be reported during the publication submission process using the FundRef mechanism (<http://www.crossref.org/fundref/>) if supported by the Publisher.
6. **Manuscript submission:** The final pre-publication manuscripts of scholarly publications produced with NOAA funding shall be submitted to the NOAA Institutional Repository at <http://library.noaa.gov/repository> after acceptance, and no later than upon publication, of the paper by a journal. NOAA will produce a publicly-visible catalog entry directing users to the published version of the article. After an embargo period of one year after publication, NOAA shall make the manuscript itself publicly visible, free of charge, while continuing to direct users

²⁰ http://www.cio.noaa.gov/services_programs/IQ_Guidelines_103014.html

²¹ Failure to perform quality control does not constitute an excuse not to share data.

²² Data without QC are considered "experimental products" and their dissemination must be accompanied by explicit limitations on their quality or by an indicated degree of uncertainty.²⁰

to the published version of record.

7. **Data Citation:** Publications based on data, and new products derived from source data, must cite the data used according to the conventions of the Publisher, using unambiguous labels such as Digital Object Identifiers (DOIs). All data and derived products that are used to support the conclusions of a peer-reviewed publication must be made available in a form that permits verification and reproducibility of the results.