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NOAA Institutional Repository Annual Operating Report

Fiscal Year 2023

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Executive Summary

Increasing compliance of NOAA's Plan for Increasing Public Access to Research Results (PARR Plan) through submission to the NOAA Institutional Repository (NOAA IR) should be considered a priority for all NOAA authors, programs, and line offices. In FY2023, the NOAA Central Library added 8,941 items to the NOAA IR, bringing its holdings to over 51,000 NOAA authored and funded publications. Despite the large number of additions to the IR, publication submissions to the IR dropped 8% over FY2022 levels. Offices and authors submitted approximately 2,200 journal articles and nearly 1,200 NOAA publications (i.e., technical memoranda, technical reports, biological opinions, etc.).

In order bolster the year-over-year decline in submissions, the NOAA Central Library embarked on an extensive harvesting program throughout the year. Using multiple sources, the NCL identified over 4000 open access journal articles published between 2015 and 2022 that had not been submitted to the NOAA IR by authors or line offices. By leveraging new workflows and tools that utilize persistent identifiers (PIDs), NCL staff was able to harvest and upload 4,009 journal articles to the NOAA IR. These items constituted 16% of NOAA's overall compliance for FY2023; bringing NOAA's overall compliance rate to 55.4% (39.5% without the NCL's efforts). The articles that NCL focused on were open access journal articles published between 2015 and 2022.

Despite the increase in overall PARR compliance for FY2023, it should not be assumed that this growth will continue. Since the backlog of open access articles has been identified and added to the NOAA IR, the ability of the NCL to impact NOAA's overall compliance rate has been exhausted. Without an increase in author submissions of manuscripts for those articles locked behind paywalls, compliance rates will begin to fall. On average, NOAA publishes about half of its research in open access journals, meaning that if we only relied on the open access articles that NCL is able to harvest, the best NOAA could achieve for compliance would be approximately 50-55%. Without stronger enforcement, submissions will continue to fall and compliance will be impacted.

Introduction

Since 2020, the NOAA Central Library has been providing an annual operating report to NOAA leadership on NOAA's compliance with the publication aspects of the 2015 NOAA Plan for Increasing Public Access to Research Results (PARR Plan). Included in this report is a discussion of system developments, publication submissions, overall agency compliance, and a breakdown of line office level metrics for 2023.

Section I. System and Workflow Developments

In FY 2023, the following features were added to the Stacks/SWAT systems and our workflows were further developed and new workflows were created.

System updates & developments

The following upgrades were made by CDC to both the frontend and backend of the NOAA IR:

- Open Researcher and Contributor Identifiers (ORCID) integration including the addition of the ORCID Icon () after personal author names.
- Additional functionality for relationship banners to indicate to users additional information such as supporting files, if a document is superseded, if there are additional details available about the document, etc. Catalogers are now able to also assign more than one banner to a record.
- Ability to generate dataset records without the need to house the data. As part of this development, CDC added a new button on the top of landing pages notifying users if there is an associated dataset available, and reciprocally if there is an associated publication when on a dataset record.
- Additional development of citation export functionality including the addition of new citation styles (i.e., Chicago and APA) as well as the ability to download bulk citations.
- Updated the user interface of the backend of the repository to be more accessible and intuitive. As part of this update, catalogers were also provided the ability to export supporting file information directly from IR records and to include notes when purging items from the NOAA IR.
- Upgraded analytics to use Google Analytics 4, allowing for the ability to monitor and track events.

Workflow developments

- *Integrating with the Research Open Registry.* Beginning in FY2023 NOAA Central Library (NCL) partnered with the Research Open Registry (ROR) which is a free open registry of persistent identifiers (PIDs) for research organizations.
- This process included:
    - Identifying NOAA Line and Program/Lab Offices with existing ROR IDs.
    - Reviewing ROR guidance as to what ROR accepts for creating identifiers within organizations.
    - Comparing ROR ID records metadata with other/alternative PID metadata such as ORCID; Global Research Identifiers (GRID); International Standard Name Identifier (ISNI); Wikidata, etc.
    - Determining what Program/Lab Offices needed RORs.
    - Disambiguating similarly named NOAA Program/Lab Offices.
    - Creating a standard naming convention for NOAA Line and Program/Lab Offices
- To date 13 NOAA ROR profiles have been updated and 48 ROR IDs have been created for NOAA offices and programs.
- *Integrating with ORCID*. Beginning in FY2023 NCL joined with the Department of Energy (DOE) by partnering with the U.S. Federal Government Consortium.

individuals. ORCIDs identify individual researchers and their outputs and help to disambiguate

- This process included:
    - Identifying Individuals with affiliations for NOAA Line, Program/Lab Offices, Divisions Cooperate Institutes/Science Centers Sea Grant and others receiving NOAA grant funding when available.
    - Comparing ORCID records with NOAA authors, contributors and grantees publications, existing in the IR.
    - Using the NOAA Affiliation Manager to manage NOAA affiliations for NOAA Federal and some Affiliate employees using ROR for NOAA offices and programs
- To date a total of 42,469 ORCID iDs have been added in the IR with 18,042 of these being unique authors.
    - There are 10,308 records that have at least one ORCID iD per record
    - 4,800 authors, researchers, contributors and grantees have been disambiguated with similar names and variations.
        - i.e. John Smith; John J. Smith; Smith, John; Smith John J; Smith, J.; Smith, J.J.
- *Using the ORCID NOAA Affiliation Manager*. Beginning in FY2023 NCL established an Affiliation Manager account that allows NCL staff to add and update Affiliation information for NOAA and NOAA-related Affiliations through the use of API keys.
- To date 69 RORs are affiliated with authors, researchers, contributors, and grantees via ORCID.
    - There are 405 NOAA affiliations in ORCID that individuals are using for their affiliations through verified PID sources including ROR, GRID, RINGGOLD[1,2], and Trusted sources[3]
    - In FY2023, 32 individuals permitted the NOAA Central Library, via the Affiliation Manager to manage their NOAA affiliations.

Section II. Journal Article Harvesting Activities

To improve PARR compliance NCL undertook extensive journal harvesting activities to bolster declining year-over-year submissions from line offices and authors. Journal article harvesting sources include PMC, CHORUS, and, new for FY2023, the use of persistent identifiers (PIDs) gathered, developed, and/or implemented through the Library's PID initiatives. This multi-faceted approach to identify, verify, harvest, catalog, and upload non-submitted, open access articles to the IR resulted in a banner year for journal article harvesting.

For the reporting period FY2023, NCL harvested 4,009 journal articles, representing over 64% of all articles uploaded to the IR in FY2023. Among the harvested articles, over 1,000 journal articles published during FY2023 and 2,900 journal articles from previous fiscal years dating back to FY2016, improving PARR compliance for previous fiscal years. Please see Appendix A for a detailed breakdown of harvested articles.

As NCL continues harvesting efforts into FY2024, the use of PIDs to identify and harvest publications of NOAA-authored and funded research cannot be overstated. 71% of journal articles harvested by IR

[1] RINGGOLD is a proprietary publisher assigned PID.
[2] ORCID has ended their support of RINGOLD IDs and is in the process switching to RORs.
[3] ORCID allows for Trusted Parties/Organizations (NOAA Affiliation Manager) to manage ORCID profile information on behalf of researchers. Researchers must grant permission for the entity to do this and are able to revoke a trusted party's access at any time.

librarians, and 46% of all uploaded journal articles for FY2023, can be directly attributed to PIDs. The use of ORCIDs, RORs, and more among authors, offices, publishers, libraries, and databases, along with associated metadata, have proven to be invaluable and will continue to do so in advancing the NOAA and NOAA IR mission of enhancing access to and use of NOAA-supported research.

Section III. Metrics

Agency-Wide

Publication Availability

The NOAA Institutional Repository includes both NOAA-produced publications dating back to 1970 (as laid out in the NOAA IR Document Policy) as well as peer-reviewed journal articles published after October 1, 2015, as dictated by the NOAA PARR Plan. At the end of FY2023, the NOAA IR contained a total of 51,327 unique items across 18 collections. The breakdown of these publications is as follows:

NOAA Series Publications (Tech memos, reports, Atlases, etc.)	NOAA Non-Series Publications (Program & policy documents, handbooks, reports to congress, instructional material, etc.)	Journal Articles (open access and manuscript versions)
15,914	18,523	16,889

Table 1: Breakdown of total number of publications in the NOAA IR by category type.

Ingests

Ingest is the process by which publications are added to the NOAA IR, but the term is also often used to refer to the number of items that have been added to the repository within a given time period. Ingesting publications is a multi-step process that includes:

1. Assigning metadata including author, office, and keyword elements;
2. Uploading the metadata and corresponding document to the CDC's Stacks system;
3. A quality check of each item to ensure metadata has been transferred correctly and that all documents (including any supporting documents or links to datasets) are accessible via the staging environment;
4. A full system index or data migration as the system refers to it, is performed to update all instances of the repository (there are 3 sets of servers on a bi-coastal system that maintain backups of the NOAA IR and its contents).

In FY2023, a total of 8,941 items were ingested into the NOAA IR. Of these items, the Library identified and harvested 5,522. The number of items added to the NOAA IR from submissions was 3,419. It should also be noted that these numbers only indicate the number of records that were created in the NOAA IR; some of these records do include a main document and multiple supporting files (i.e., additional volumes, appendices, etc.).

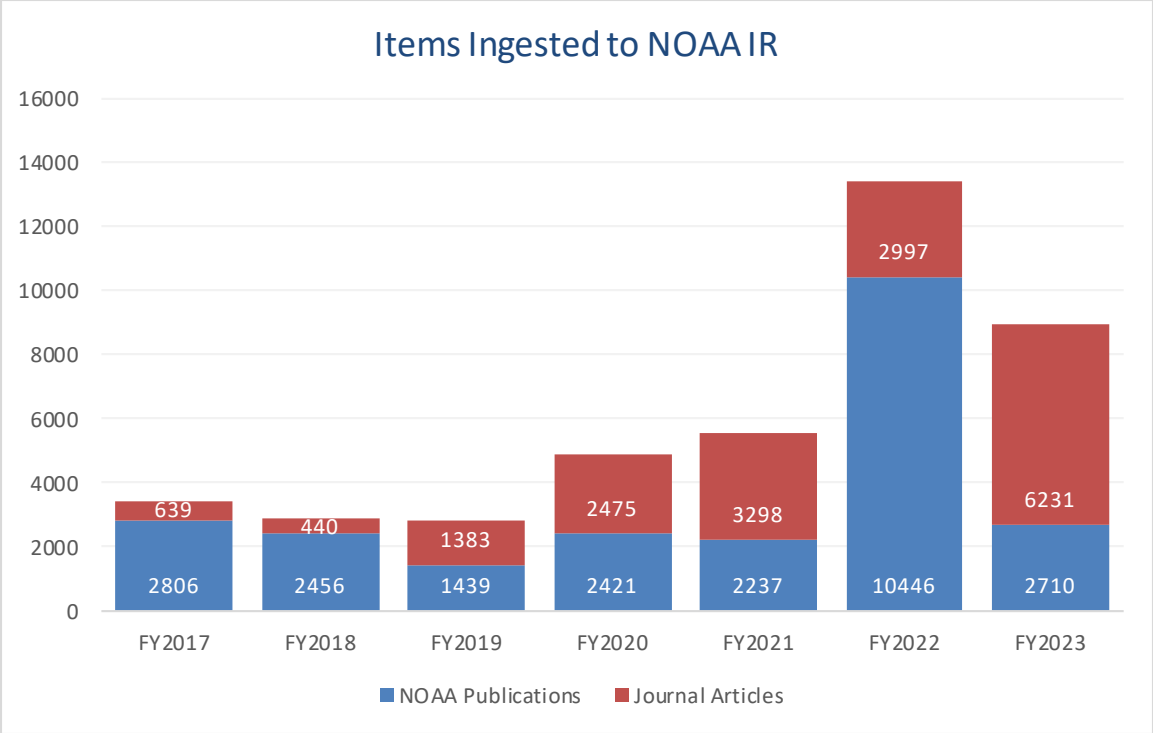

Figure 1: A non-cumulative comparison of NOAA Publications and journal articles ingested annually.

	# of NOAA Publications (Cumulative)	# of Journal Articles (Cumulative)	# of NOAA DOIs (Cumulative)	# of items Added in FY2023
NESDIS	1,517	1,675	447	692
NMFS	9,958	3,609	3,140	2,883
NOS	4,601	1,552	333	908
NWS	2,682	1,270	99	885
OAR	9,829	8,523	683	2,862
Cooperative Institutes	186	6,184	167	2,082

Table 2: Comparison of total number of NOAA publications and journal articles in each collection; as well as the total number of DOIs minted by the NOAA Central Library and the number of items that were added to each collection in fiscal year 2023.

Submissions

Per the NOAA PARR Plan, all intramural and extramural researchers are required to submit their publications to the NOAA Institutional Repository. Submissions refers to both NOAA publications and journal articles that are either NOAA-authored or NOAA-funded research and are used to estimate compliance rates (see Compliance section below). A submission is defined as a publication that has been sent to the NOAA IR via one of the following methods:

1. Revised NOAA IR Submission and DOI Request Form
2. Email sent to noaa.repository@noaa.gov
3. Through the Research Publication Tracking System (RPTS) (implemented in NMFS and some offices with NESDIS, NOS and OAR offices)
4. Via NMFS's ECO tracking system for Biological Opinions

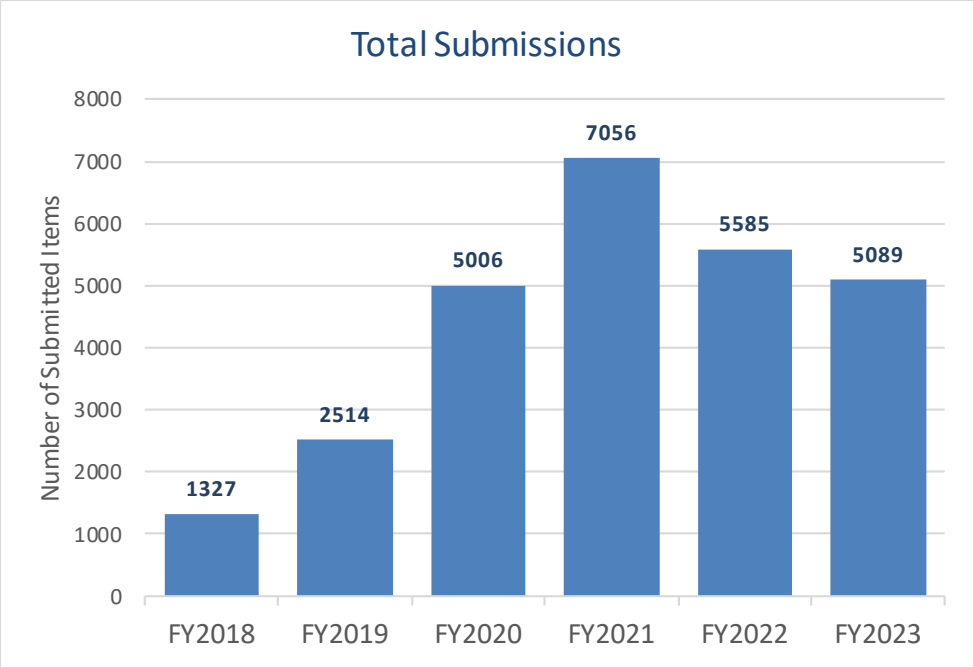

Figure 2: Number of total submissions to the NOAA IR through all submission methods from FY2018 through FY2023. In FY2023 most submissions came via the form (2,701) followed by email (1,220) and RPTS (1,168).

Stalled Submissions

There are circumstances when a submission that is sent to the IR does not make it onto the platform.

1. Duplicate Submissions - If the submission is already in the Institutional Repository, it is marked as such and the submitter is notified of the duplication and provided with a current link to the publication in the IR.
2. Policy restrictions - We do receive submissions that are outside of the scope of our Document Inclusion Policy and Guidelines. Submissions must comply with these policies to be included in the IR. The most common reason a submission may be turned away because of policy include:
    1. The document does not indicate a NOAA Author or NOAA funding.
    2. The submission is a journal article that predates October 1, 2015
    3. The submission does not have a title page that identifies it as a NOAA publication
    4. The submission is a book chapter, magazine article or poster.
3. Manuscript Request - If the journal article is not open access and the publisher does not allow the IR to post the published version, the IR team will request a journal manuscript from the submitter. Sometimes referred to as an accepted manuscript, post-print, or post-refereed, it is a draft of a manuscript after it has been peer reviewed but does not have publisher added content like pagination and logos.
4. 508 Request - NOAA publications must pass a 508 compliance check before being accepted into the Institutional Repository. If there is an issue with the compliance, the IR team will contact the submitter and request edits in order for the document to be included. Because we offer 508 remediation on Journal manuscripts, this would be limited to NOAA publications.

Stalled submissions tracking began in January 2023. For that reason, all metrics presented in this report on Stalled Submissions will be for the calendar year, not the fiscal year. In 2023 there were a total of 469 stalled submissions, with 317 being journal articles and 152 being NOAA publications.

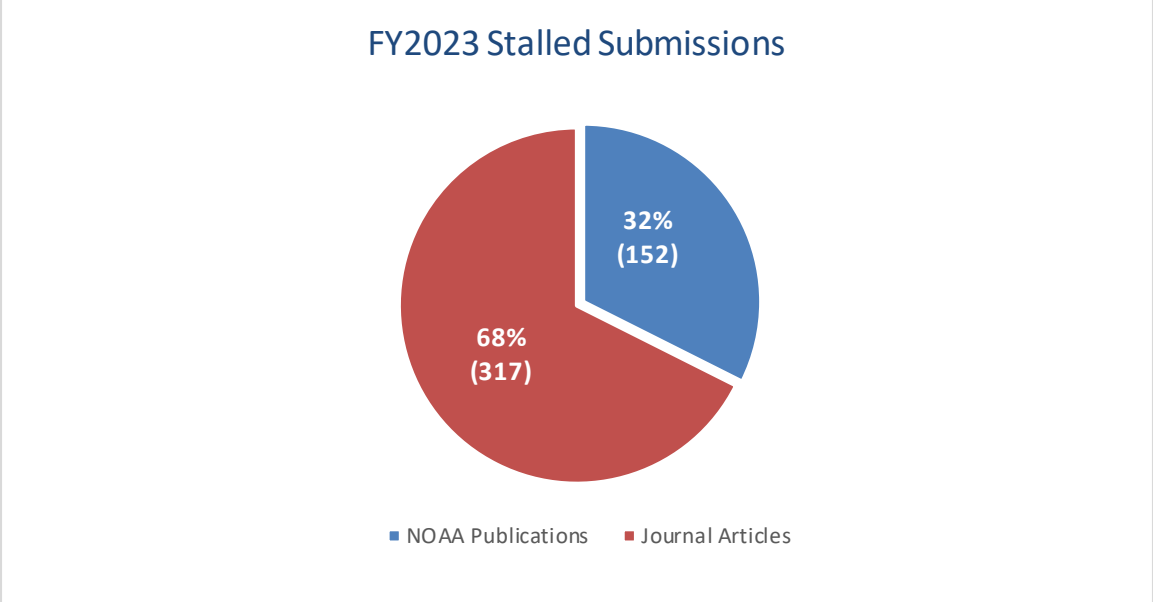

Figure 3: Percentage of stalled submissions that are journal articles compared to NOAA publications. Journal articles comprised over 67% (317) and NOAA documents comprised 32.4% (152) of these incomplete submissions.

Journal Article Rejection Breakdown		
Reason for rejection	Number of Submissions	Percentage
Unanswered manuscript request	117	36.9%
Out of scope	28	8.8%
Already in the NOAA IR	172	54%
TOTAL Journal Articles not accepted	**317**	

Table 3: Breakdown of stalled journal article submissions by reason for the rejection. Of the 317 journal articles turned away in 2023, more than half (54%) of these submissions were already in the NOAA IR, followed by unanswered manuscript requests (36.9%).

NOAA Publication Rejection Breakdown		
Reason for rejection	Number of Submissions	Percentage of NOAA Publications
Not 508 Compliant	43	28.3%
Out of scope	22	14.5%
Already in the NOAA IR	87	57.2%
TOTAL NOAA publications not accepted	**152**	

Table 4: Breakdown of stall NOAA publication submissions by reason for the rejection. Of the 152 NOAA publications turned away in 2023, 57% were already in the NOAA IR; 14% were out of scope; and over 28% were not 508 compliant upon submission or revised.

Pageviews and Downloads

Currently, the NOAA Central Library reports IR usage metrics obtained through Google Analytics. The numbers provided reflect annual pageviews for the NOAA IR since FY2018. At the end of FY2021, CDC implemented event tracking through Google Tag Manager, which will allow for the capture of more accurate download data as well as more granular information on how and what people are searching for

in the NOAA IR. While the IR team and CDC are still working to refine these new capabilities, it was determined that the NOAA IR had:

Total pageviews for FY2023	Main document downloads	Citation exports generated
546,921	111,252	31,769

Table 5: Shows number of NOAA IR pageviews, document downloads, and total citations exported from the system.

Compliance Calculation

Compliance with the NOAA PARR plan is defined as the ratio of: (1) the number of peer-reviewed scholarly articles subject to NOAA's public access policy that have been submitted and accepted to the NOAA IR (including those still under embargo) divided by (2) the total number of peer-reviewed scholarly articles that are subject to NOAA's public access policy, and is expressed as a percentage. This method of calculation is consistent with the Office of Science and Technology Policy (OSTP)'s reporting method and has been adopted by other federal agencies for their compliance reporting.

The NOAA Central Library estimates the number of published articles subject to the NOAA PARR plan by searching Web of Science (WoS) for NOAA-produced and NOAA-funded journal articles. This count underestimates the number of publications due to two factors. First, WoS contains most but not all of the journal titles in which NOAA publishes, so it will always lack an unknown but assumed small number of publications. Second, there may be a lag of several months between publication and the appearance of a citation in WoS. The number of peer-reviewed publications given represents an actual count of WoS articles identified by the NOAA Central Library as NOAA-produced or NOAA-funded, published October 2015 to present.

Another reason for limiting the scope of publications included in compliance rate estimations to journal articles is the fact that the total number of NOAA publications that are produced in a given year is unknown. Furthermore, the category of NOAA publications includes a wide range of publication types, adding to the variability of this metric. Until a process for tracking all NOAA publications is devised, either through the establishment of a central publishing unit within the agency or office level reporting on these publications, we will not be able to include them in our compliance figures.

For the purpose of calculating the agency's overall PARR compliance to OSTP, the numerator of our ratio includes the following:

1. Articles submitted to the NOAA IR and have been accepted for inclusion regardless of submission method (i.e., email, form, RPTS, batch, etc.)
2. Any articles harvested from PubMed Central (PMC). Per a letter of understanding between NOAA and NIH, we treat these articles the same as a NOAA submission
3. Articles identified and harvested by Library staff via CHORUS (Clearinghouse for the Open Research of the United States).
4. Open access articles identified through the bibliometrics program that were not included in any of the above counts.

Articles added via PMC, CHORUS, or through the bibliometrics program are not included in NOAA IR submission numbers since their identification and inclusion were the work of Library staff. It should also be noted that not all submitted articles are included in the compliance calculations. For example, NOAA publications are included in submission calculations, but are excluded from compliance calculations

since the Library is unable to determine the total number of these publications; only those that are sent to the NOAA IR. Similarly, we do not include submissions where the wrong version of a publication (i.e. author submitted a publisher's version but due to copyright an author accepted manuscript is required) was received.

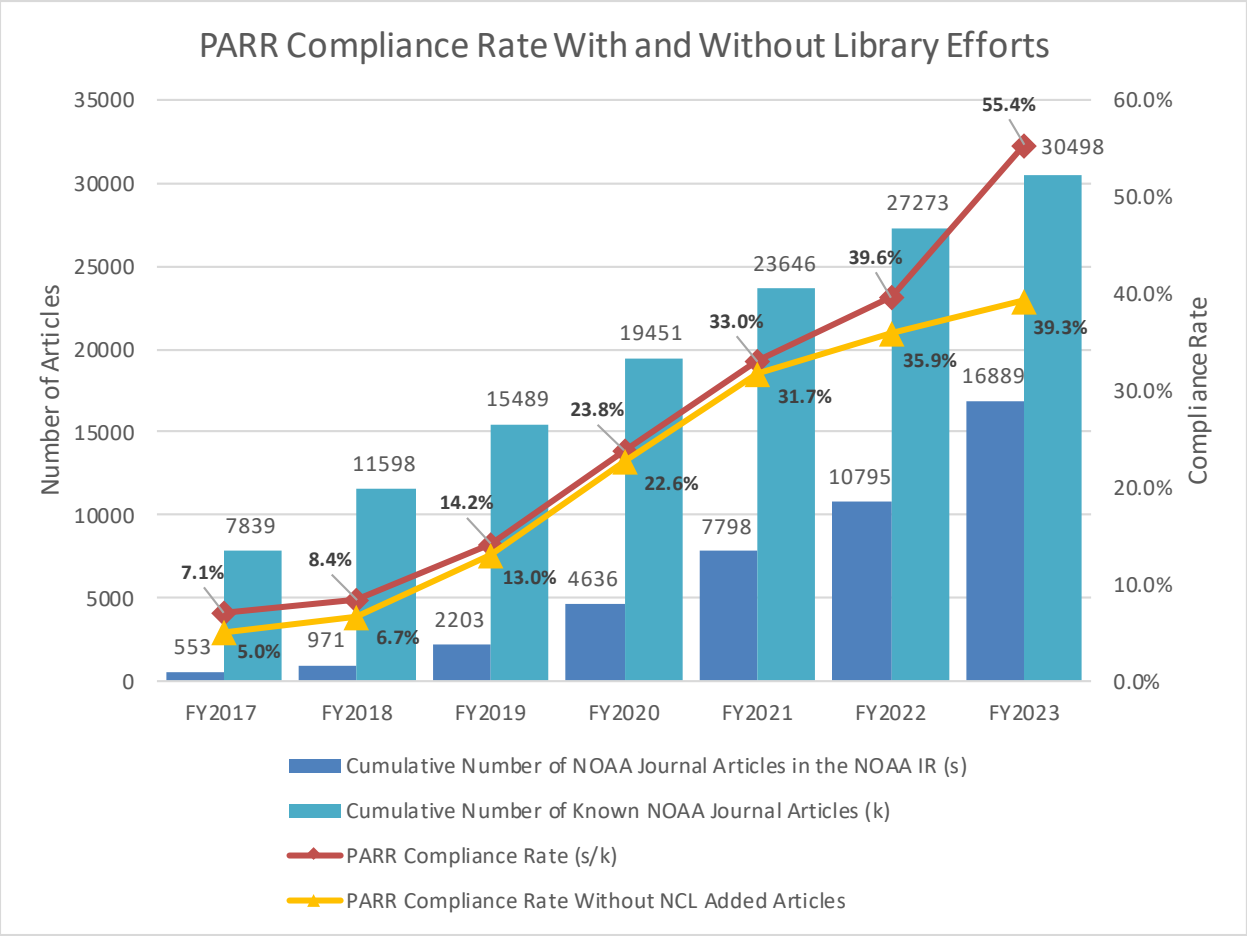

Figure 4: Cumulative number of journal articles added to the NOAA IR compared to the cumulative number of known journal articles published since FY2016. Also shown is the comparison of the rate of compliance as reported to the OSTP for each fiscal year with the Library's harvesting efforts (in red) to the rate of compliance without the Library's harvesting efforts (in yellow).

As showing in Figure 4, the harvesting efforts of the NOAA Central Library provided a significant impact on NOAA's overall compliance. This increase in compliance highlights two things: 1) the low rate at which authors are submitting their open access publications and; 2) the significant amount of work the Library has put into identification and harvesting on behalf of offices to ingest the backlog of PARR required publications. It should be reiterated here that the vast majority of the publications harvested by Library staff are open access publications and that our efforts focused on journal articles published between 2016-2022 (calendar years). With this in mind, future harvesting efforts will only result in small gains since the vast majority of the open access backlog has now been added to the NOAA IR.

On average NOAA publishes open access approximately 52% of the time, with the remaining articles being published behind a paywall (i.e., requiring a subscript to access the full text). Without increased

submission by NOAA authors of their post-refereed, pre-publication manuscript to the IR, NOAA will never reach a compliance rate above the current 55%, despite Library efforts.

Below we have provided a graphic representation of each Line Office's compliance for calendar year 2023. In each graph you will see the following represented:

1. Total number of 2023 journal articles added to the NOAA IR (this includes both harvested and submitted articles)
2. Number of 2023 journal articles submitted to the NOAA IR
3. Total known 2023 journal articles published
4. The overall compliance for each LO (triangle icon)
5. The compliance rate for submitted articles: i.e., LO compliance minus Library harvested materials (square icon)

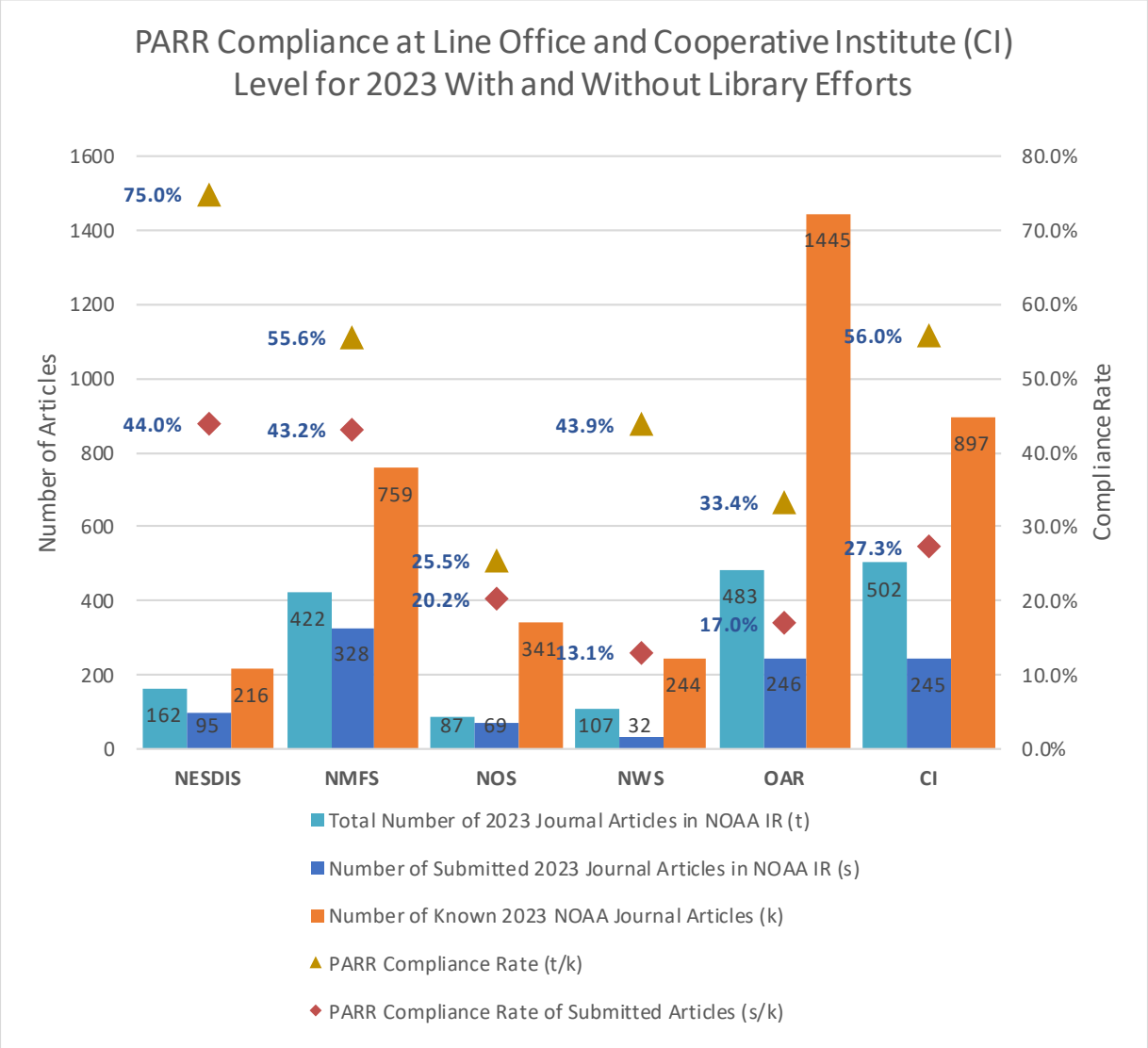

Figure 5: Comparison of each line office and the Cooperative Institutes ingests, submissions, and overall compliance both with and without library harvesting efforts. Offices that benefited the most from library harvesting include NESDIS, NWS, and the Cooperative Institutes, however all offices did see significant increases in compliance thanks to the library.

Line Offices

In this section we have provided comparisons of PARR compliance for each line office from 2021-2023. These numbers are the total compliance, including Library harvested materials. Note: Line Office compliance is a snapshot of a single year and is not cumulative. LO level metrics are not directly reported to OSPT. These calculations are intended to help offices gauge progress and identify areas for improvement.

NESDIS

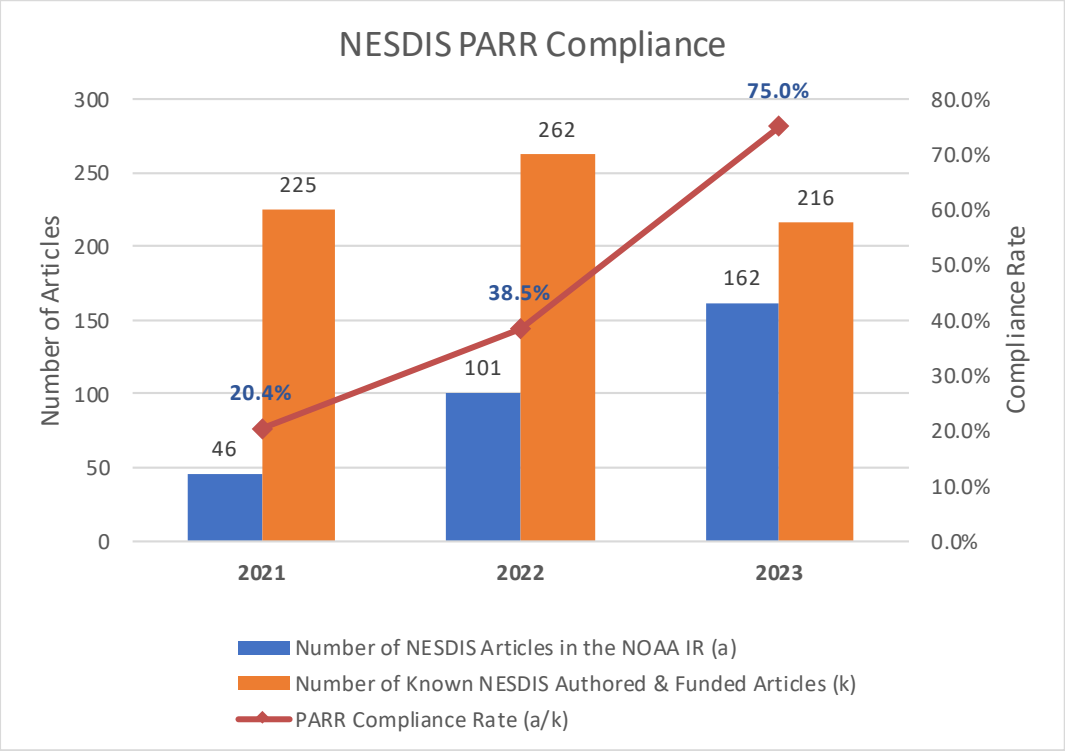

Figure 6: Comparison of NESDIS compliance from 2021-2023.

NMFS

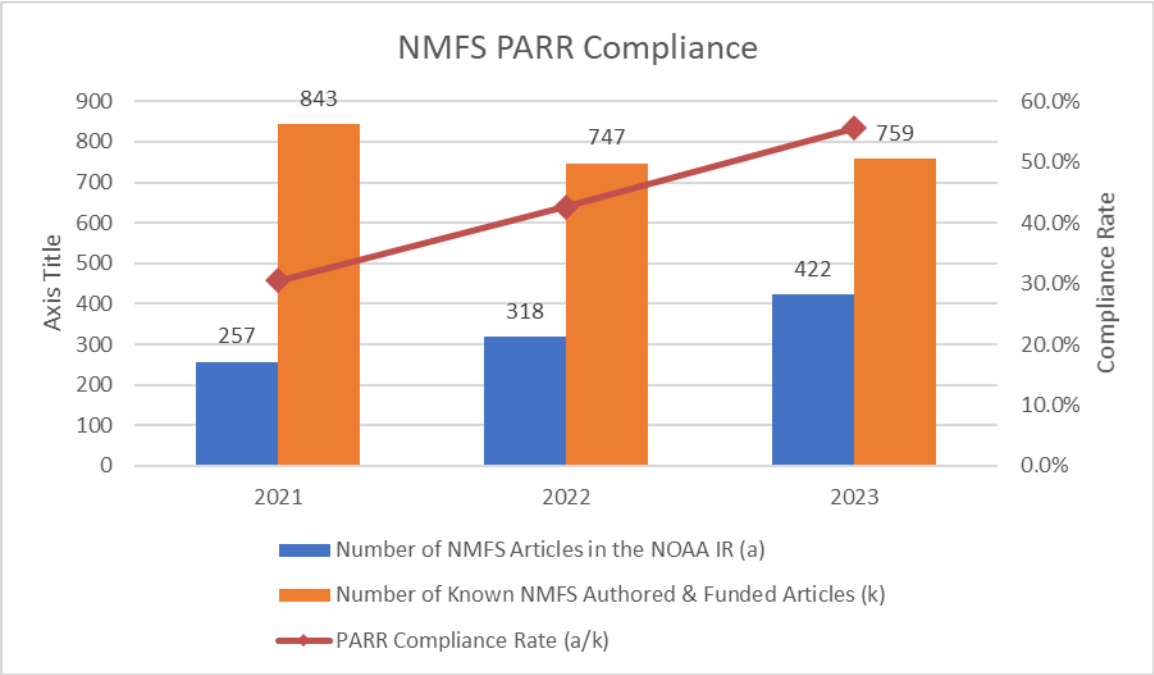

Figure 7: Comparison of NMFS compliance from 2021-2023.

NOS

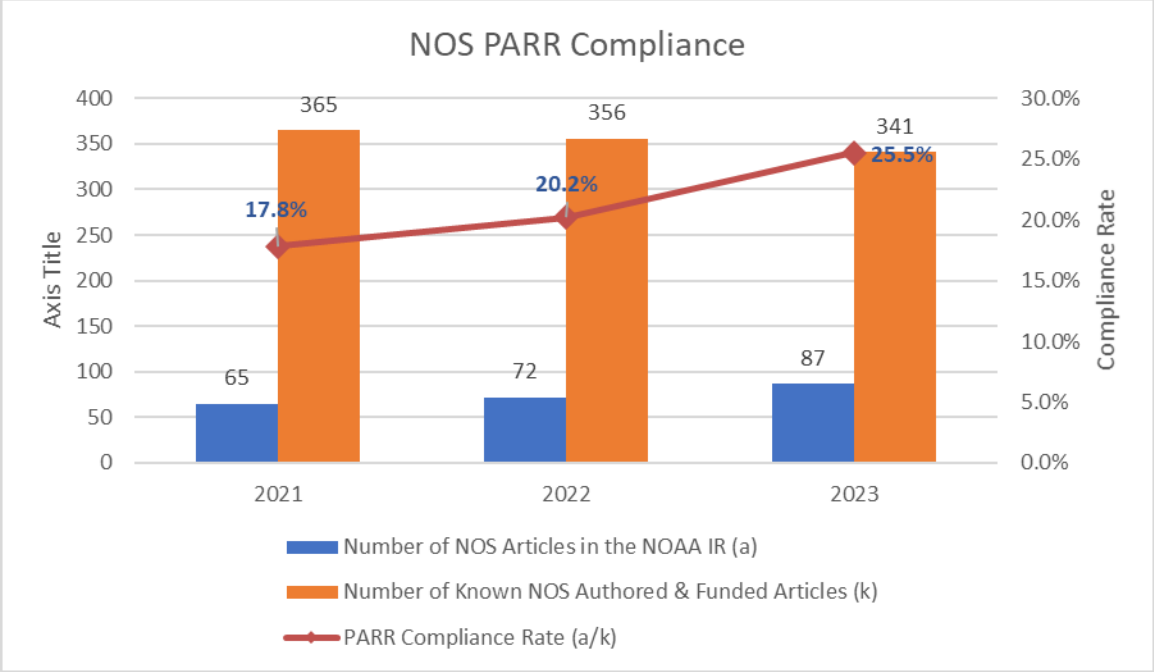

Figure 8: Comparison of NOS compliance from 2021-2023.

NWS

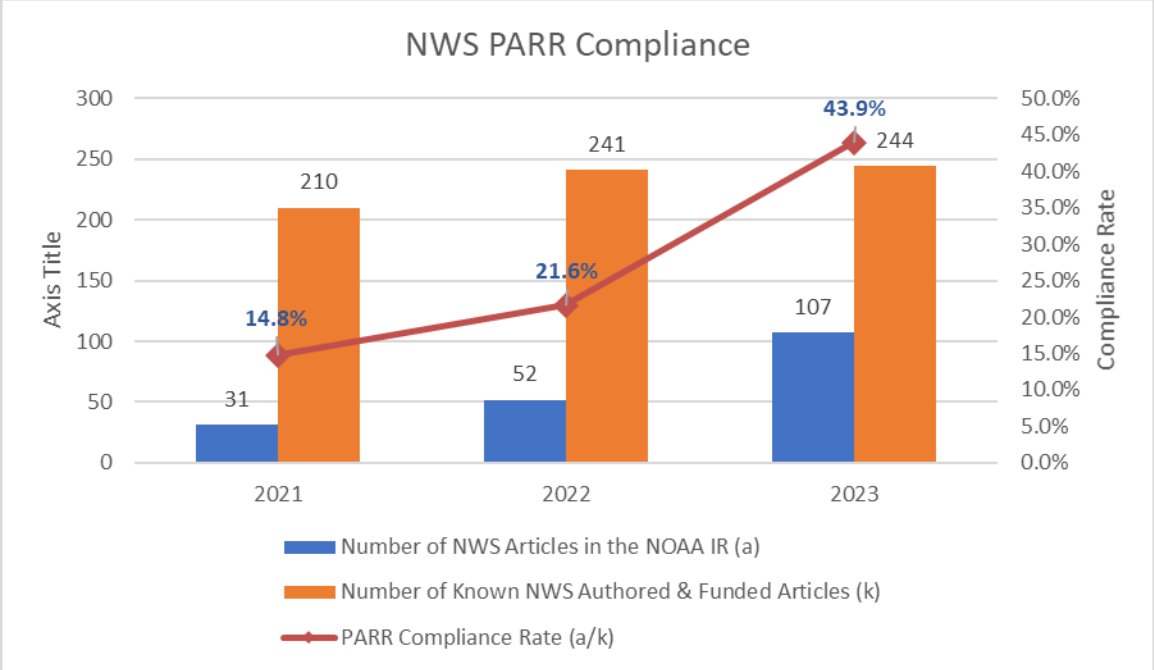

Figure 29: Comparison of NWS compliance from 2021-2023.

OAR

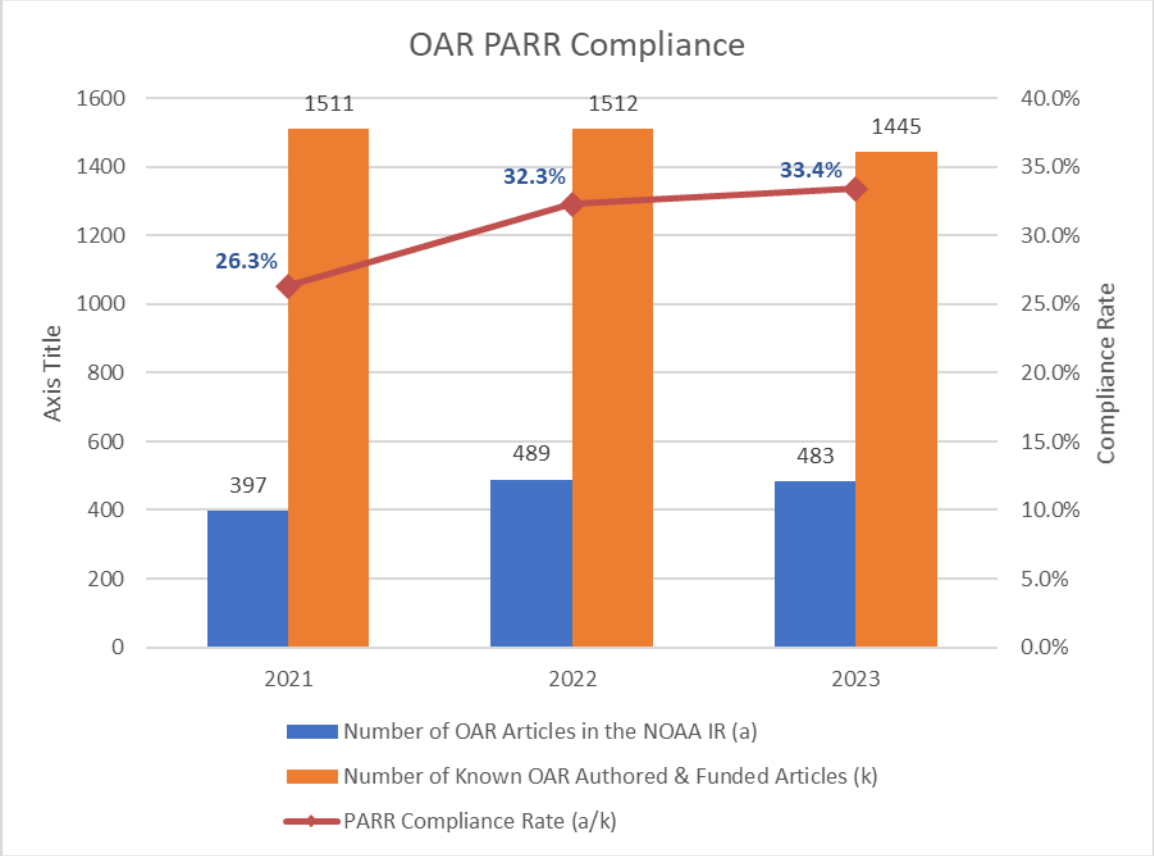

Figure 10: Comparison of OAR compliance from 2021-2023.

Cooperative Institutes

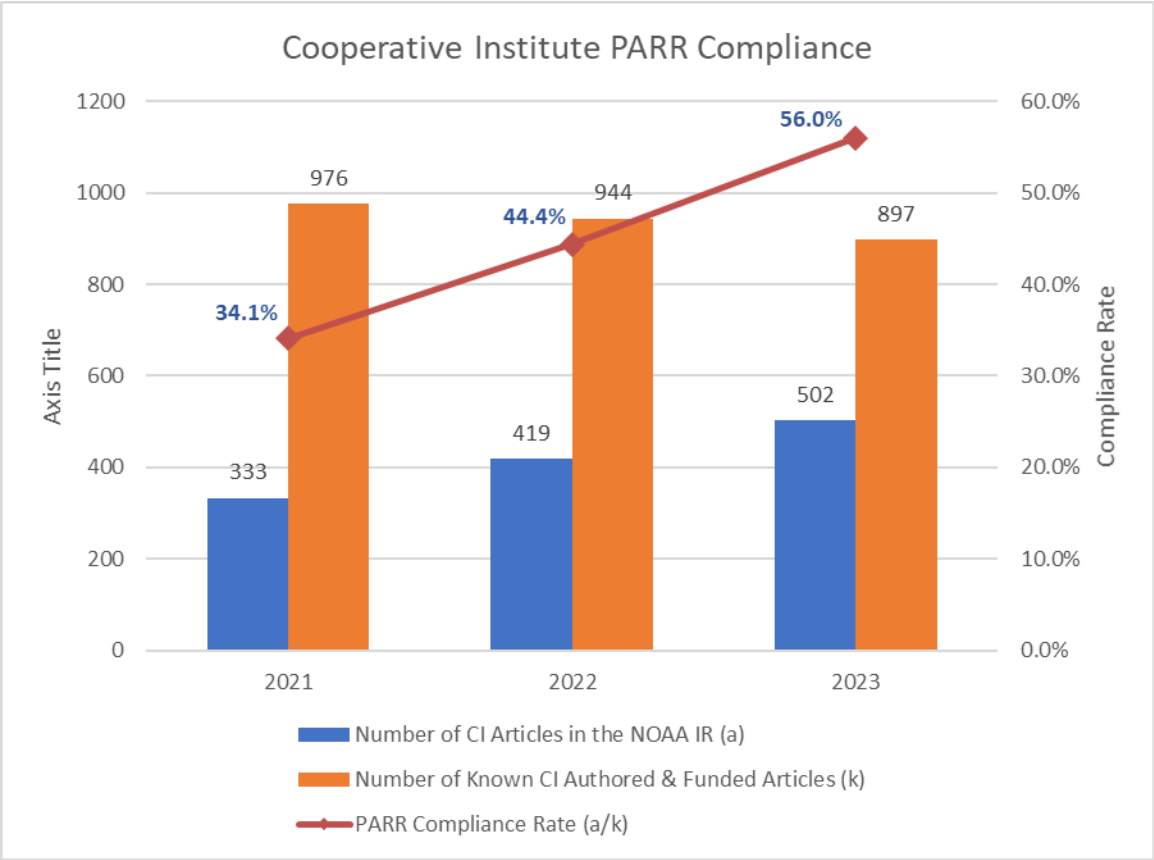

Figure 11: Comparison of Cooperative Institutes (all CIs together) compliance from 2021-2023.

Appendix A. NCL Harvesting Statistics

FY2023 NCL Harvested Journal Articles by Collection and Publication Year										
NOAA IR Collection	2023	2022	2021	2020	2019	2018	2017	2016	2015	Total
NESDIS	67	81	33	38	23	41	33	23	3	342
NMFS	94	96	113	151	132	109	154	116	12	977
NOS	18	59	74	58	44	59	60	35	2	409
NWS	75	88	63	50	56	76	86	25	2	521
OAR	237	269	117	88	117	145	203	151	27	1354
OMAO	0	1	0	0	2	0	2	0	0	5
Cooperative Institutes	256	281	112	138	71	90	149	117	8	1222
Cooperative Science Centers	6	3	6	9	11	2	12	8	1	58
CRCP	11	10	11	7	12	4	12	9	0	76
Deepwater Horizon	1	1	4	2	1	2	8	3	1	23
Sea Grant	2	10	11	14	20	12	12	5	2	88
NOAA General Documents	6	6	0	1	8	7	4	4	0	36

Table 6: Breakdown of the 4,009 articles harvested by the NCL and added to corresponding collections. Number of articles will equal total more than the 4,009 since some articles being attributed to multiple offices and programs.

FY2023 NCL Harvested Journal Articles by Collection Totals			
NOAA IR Collection	Total Articles	Harvested Articles	Harvesting Percentage (%)
NESDIS	601	342	56.9%
NMFS	1735	977	56.3%
NOS	653	409	62.6%
NWS	598	521	87.1%
OAR	2052	1354	66%
OMAO	8	5	62.5%
Cooperative Institutes	2025	1222	60.3%
Cooperative Science Centers	89	58	65.2%
CRCP	145	76	52.4%
Deepwater Horizon	43	23	53.5%
Sea Grant	366	88	24%
NOAA General Documents	76	36	47.4%

Table 7: Breakdown by collection of harvested articles added to the NOAA IR and their percentage.

Glossary of Terms

Compliance

For the purposes of this report compliance is defined as the ratio of: (1) the number of peer-reviewed scholarly articles subject to the agency's public access policy that have been submitted to the agency's designated repository/system (including those still under embargo) divided by (2) the number of total number of peer-reviewed scholarly articles that are subject to the agency's public access policy, and will be expressed as a percentage. This method of calculation stems from the reporting requirements that have come from the Office of Science and Technology Policy (OSTP) and we have opted to carry over that method to this report.

Items added

This refers to the publications and their associated metadata that have been ingested into the NOAA Institutional Repository. This number does not necessarily mirror the submissions numbers for a given year due to previous fiscal year carry over and work done by the NOAA Central Library to identify and add publications that have not been submitted by offices/authors. An example of these efforts would be the digitization projects NOAA Central Library staff have conducted scanning and ingesting older NOAA technical memorandum and report series from all line offices.

Submission

A submission is a publication that has been sent to the NOAA IR via one of the following methods:

1) NOAA IR Submission Form via Google Drive
2) Email sent to noaa.repository@noaa.gov
3) Through the RPTS system
4) Via NMFS's ECO tracking system for Biological Opinions

Ingest

Ingest is the process by which publications are added to the NOAA IR and include a series of steps including:

1) Metadata creation
2) Metadata and file upload to the cloud
3) Quality checks and item approvals by data manager(s)
4) System indexing or data migration to push all metadata and associated files "live" making them available via the NOAA Institutional Repository page.

NOAA publications

NOAA publications are publications as defined in NAO 201-32G and can include the following areas:

1) *NOAA Authored Publications* refer to those publications that have been written by NOAA employees or NOAA contractors, and were written as part of their official duties.
2) *NOAA peer-reviewed scholarly publications* are defined as research results that are published in peer-reviewed or refereed journals; meaning the process includes a review of the research by independent scholars, experts, etc. in the field who agree that the article in question represents properly conducted research and/or writing. Within this report these will also be labeled as journal articles. For the purposes of this report and our calculations, journal articles figures will exclude those still under embargo, but include those that are not subject to the NOAA PARR Plan.
3) *NOAA Funded Publications* can refer to two different kinds of publications: those produced through grant funding, most often, but not exclusively by universities via the NOAA Cooperative Institute Program; and those publications produced by companies contracted by NOAA.