

# 2022 ANNUAL OPERATING REPORT

NOAA RESEARCH AND DEVELOPMENT DATABASE



U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

# 2022 NOAA RESEARCH AND DEVELOPMENT DATABASE ANNUAL OPERATING REPORT

NOAA Technical Memorandum OAR OSS-003

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Office of Science Support  
NRDD Management and Development Team

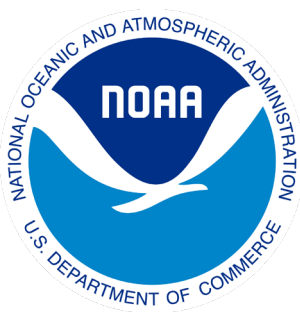
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## ACKNOWLEDGEMENTS

This work was completed with the collaborative efforts and input of the entire NRDD community: data enterers, program and project managers, the NRDD Information Technology (IT) team, the Research and Development Enterprise Committee (RDEC) and many more. This report aims to share the accomplishments and milestones delivered by the NRDD community.

## COVER PHOTO

Outer space free photo on Unsplash. By [NASA](#) on [Unsplash](#).



U.S. Department of Commerce  
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# EXECUTIVE SUMMARY

The National Oceanic and Atmospheric Administration (NOAA) Administrative Order (NAO) 216-115B provides guidance by which research and development throughout NOAA can be continually planned, reviewed, evaluated, and rebalanced according to evolving mission needs. This NAO mandates that in order for NOAA to maintain accountability for NOAA's research and development (R&D) portfolio, planned and actual NOAA R&D investments for NOAA research and development will be enumerated and monitored in a database. NOAA monitors its research and development portfolio through the [NOAA Research and Development Database \(NRDD\)](#), an online repository that serves as a single access point for R&D project data conducted by NOAA and NOAA-funded external partners.

The 2022 NRDD Annual Operating Report informs the Research and Development Enterprise Committee (RDEC), the governance body with responsibility for meeting the goals of the NRDD, as well as the NRDD user community, of how NRDD funding is used to meet user satisfaction. The NRDD Annual Operating Report tracks the major developments, enhancements, and activities implemented by the NRDD Development and Management Team. The report also captures the operational performance of the NRDD environment, challenges faced by the user community, and how the NRDD team worked to address the user feedback with the implementations delivered in 2022.

## **Key System Enhancements to the NRDD in 2022:**

### **1. NRDD Production Site/ Import Template Updates and Additions**

Users can now identify projects funded through 2021 and 2022 supplemental appropriations bills. Additionally, the strategic plans data fields now reflect the goals in the 2022-2026 Department of Commerce Strategic Plan and NOAA 2022 - 2026 Strategic Plan, Building a Climate Ready Nation

### **2. FY22 Export/Update Template**

The FY22 Export/Update Template processes bulk updates of existing projects in the NRDD. This benefits users who have large numbers of projects in the NRDD that need their Actuals information updated for the current year.

### **3. Error Checking Implementation**

The process for backend error checking procedures in the NRDD Import and Export templates were updated to process and validate errors in bulk amounts, rather than in increments, saving data processing time for both the users, admins, and IT developers.

### **4. Application Programming Interface Prototype**

A prototype of the Application Program Interface (API) for the NRDD Query Builder enables client applications to extract NRDD data into their systems. APIs allow for direct access of data sources without middle party procedures.

### **5. Transition Plan Exporting**

The Transition Plan module enables NRDD administrators to download transition plan files directly from the NRDD, avoiding longer waiting periods and saving Information Technology (IT) developer hours.

# SECTION I. BACKGROUND

## 1. THE NRDD

NOAA monitors its research and development portfolio through the [NRDD](#), an online repository that serves as a single access point for research and development (R&D) project data conducted by NOAA and NOAA-funded external partners. The NRDD supports the implementation of NAO 216-115B by capturing consistent and comprehensive information on NOAA's R&D investments. The NRDD standardizes metadata to enable easy discovery and access to R&D information and encourages interoperability between NOAA R&D systems. The information in the NRDD is accessible to all NOAA federal and contracting staff, improves transparency and coordination of R&D, facilitates research transitions, and assists with strategic planning efforts.

The NRDD is populated with information from all NOAA Line Offices conducting R&D, either through manual data entry to the NRDD website or through bulk imports using the NRDD Import Template. The Export/Update template is a new feature that enables bulk updates for data that is already in the NRDD. The database captures the following project management data:

- **Owners** (project title, accountable office, points of contact, and project team)
- **Project Goals** (timeline, deliverables, milestones, and performance measures)
- **Description** (benefits, outcomes, and keywords)
- **Partners** (internal and external to NOAA)
- **Strategic Plan** linkages (DOC Strategic Plan, NOAA Strategic Plan, and NOAA Research and Development plans)
- **Transitions** (current and planned readiness levels and transition plans)
- **Resources** (funding lines, grant numbers, planned and actual annual project cost, and leveraged resources)

## 2. NRDD PURPOSE AND SCOPE

As per [NAO 216-115B](#), the NOAA Science Council coordinates all matters of R&D within NOAA and is the sole executive sponsor for the NRDD. The Procedural Handbook for [NAO 216-115B](#) states that the RDEC, a working committee under the NOAA Science Council, provides oversight for the NRDD. Additionally, the Handbook establishes the NRDD Management Team as responsible for managing the overall design and functionality integrity of the NRDD from a technical perspective. Although the NRDD is a growing database, it currently does not represent the organization's full portfolio. It does however provide a high-level overview of NOAA's R&D portfolio, as well as a transparent means to monitor NOAA's R&D investments.



The NRDD supports both enterprise and project management of R&D. Examples include:

Enterprise Management	Project Management
<ul style="list-style-type: none"> <li>• A data collection tool for the monitoring NOAA’s R&amp;D portfolio for use in tracking specific topical areas, special R&amp;D taskers (e.g. enumerating tracking COVID-19 related projects), and responding to Congressional Inquiries (e.g. Congressional Report on Deep water research).</li> <li>• Supporting NOAA’s ability to transition research to operations, applications, commercialization, and other uses by tracking readiness level progression, completed transitions, and a repository for all signed transition plans.</li> <li>• A means of collecting accomplishments, forms of collaborations and integration across NOAA</li> </ul>	<ul style="list-style-type: none"> <li>• Enable individual labs, programs, and science centers to keep track of project milestones, deliverables, and metrics</li> <li>• Provide visibility to individual lab and program R&amp;D progress</li> <li>• Provide attribution to lab and program scientists and their contributions to NOAA’s R&amp;D portfolio</li> <li>• Facilitate conversations between Principal Investigators, NRDD data enterers, and NOAA program and project managers on NOAA priorities and strategic goals</li> </ul>

## SECTION II. USER AND STAKEHOLDER ENGAGEMENT

User and stakeholder engagement is essential to ensuring that communications are streamlined directly to those impacted by system changes. The NRDD Management Team maintains consistent and ongoing communications with the NRDD users in a variety of ways that facilitate an open line of communication. Quarterly Users Forums, monthly announcements, group training, one-on-one meetings, and email communications are offered as opportunities for the NRDD Management Team to engage with users to troubleshoot issues and provide support, and gather feedback that can be used to inform improvements in the functionality and utility of the NRDD.

The NRDD Management Team also engages with the wider NRDD community to gather feedback on the customer experience, as well as to ensure that the data collected in the NRDD are meeting information requests from across the agency.

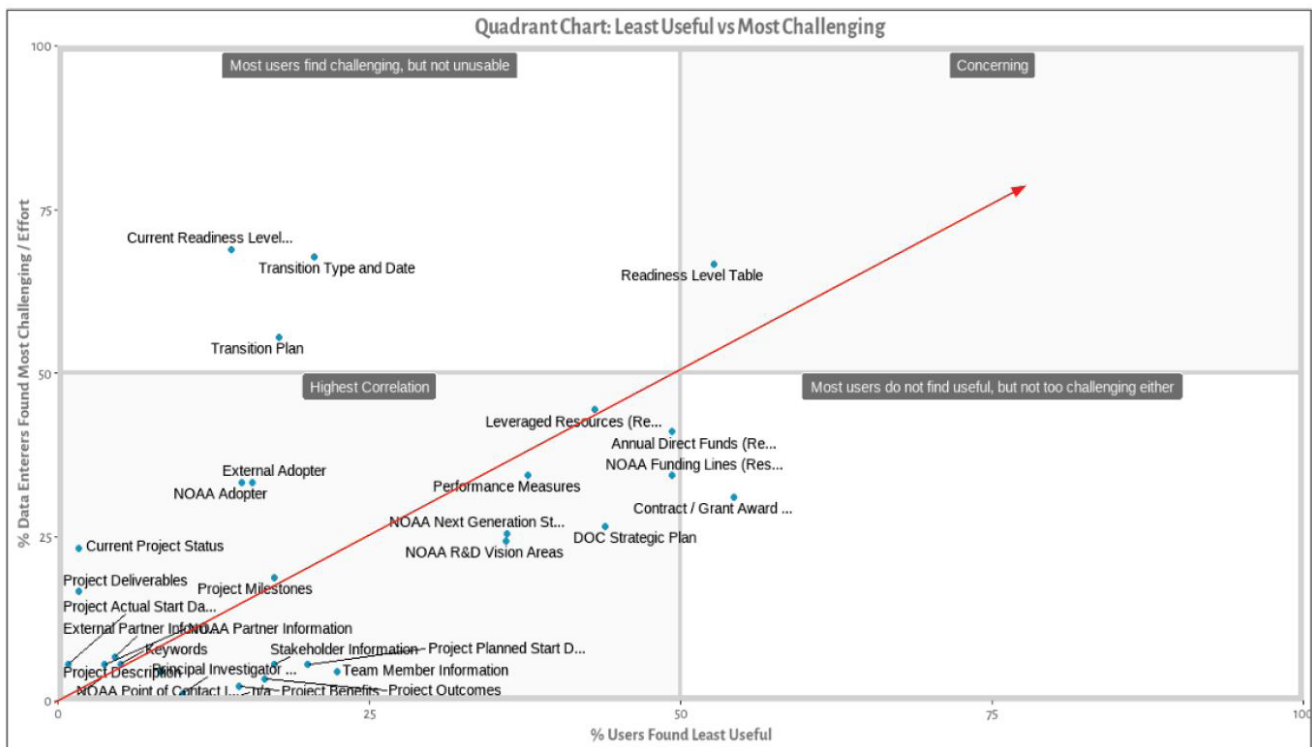
### 1. NRDD DATA USE SURVEY

Per the NOAA RDEC Work Plan item to expand the use of the NRDD, the RDEC surveyed the user community in October 2022 to understand current NRDD data field use and ongoing challenges to

data entry. The survey results are used to inform the RDEC on user pain points, what data require excessive effort on part of the data enterers, and to gauge whether or not the NRDD is being used for its intended purposes.

The survey results show that some of the concerns raised by individual users are not limited to any one person but are applicable to comments raised by all Line Offices, Labs, or Programs. It was also found that many labs and programs have smaller R&D or project databases from which they manage their R&D projects or store R&D information. In spite of that, a majority of respondents shared that they search or query R&D information from the NRDD at least once or twice a year.

Due to the sample size of 40 respondents and an imbalance of Line Office representation to the survey, the survey responses, or votes, were standardized to give each Line Office an equal weight to the total sum. When asked what NRDD data fields they found most useful, over half of the weighted votes noted that the Project Description, NOAA Point of Contact (POC)/ Principal Investigator (PI) contact information, and Current Project Status were most useful. They then reported that the information provided by these data fields are used to respond to taskers or to search for information. For data fields that were found least useful, users voted for the Resources Information (contract/grant award numbers, direct funds, funding lines, leveraged resources) and Readiness Level (RL) Table (Figure 1). Other information found to not be useful include the strategic plan linkages and performance measures.



**Figure 1:** Quadrant chart displays the correlation between the NRDD data fields that users found least useful versus most challenging during the data entering process. Closeness to the red line indicates unanimity on the usefulness and challenges of the data field. Moving close to the red line and away from zero indicates that the data field is found to be both challenging and not useful.

In terms of the challenges faced during the data entry process, data enterers reported that much of the effort comes from the unavailability of project information in other data sources which then leads to significant guesswork. This issue may arise when data enterers are required to put

in the Resources information for a project. If the project requires the data enterer to track funding from multiple sources, then the funding information will need to be available in those sources. Otherwise, they may provide estimates of the funding that are not entirely accurate or they may not provide any information at all. Another instance of this issue occurs when users are entering the current or expected RLs. Users have found that interpretations of RLs are biased and require guesswork<sup>1</sup>. Because much of the data being ingested to the NRDD is being copied over from other data sources, difficulties arise when databases are not interoperable. So although the data exists, it is not in a standardized format and must be parsed.

Overall, many users expressed that they would benefit from less data fields in the NRDD and a means to reduce the duplication of effort of copying data from one data source to another. They have also shared that they are looking to receive more guidance and direction from their leadership on the prioritization of entering data in NRDD. Others requested formatted reports as opposed to 'raw' data, a more user friendly QueryBuilder tool, or the ability to track RLs using a different feature. Due to the nature of the feedback received, the survey results may be used to defend or justify the implementations of specific developments. These results help ensure that the development and prioritization of future NRDD developments are aligned with user feedback.

## 2. NRDD USER FORUM AND USER TRAINING

The NRDD Management Team holds a quarterly (reduced from monthly in the previous year) user forum to keep users up to date on system changes, solicit feedback, provide an open forum for concerns, and address topics of interest to users. Meetings are supplemented with monthly email announcements to NRDD users with timely updates. The quarterly user forum typically has an attendance of around ten people and generally includes users from OAR or NESDIS.

In 2022, the NRDD Management team conducted the following group and individual training to inform users of how data gets ingested, and how the data may be pulled or used from the system. These trainings include:

- NRDD 101 sessions for new users to be informed on data ingestion processes, data outputs, and data uses
- [NRDD QueryBuilder](#) session for NRDD users interested in learning to extract or query data from the NRDD.
- Demonstrations of the Application Program Interface (API) prototype to show specific capabilities and uses of the API. These demonstrations enable users to better understand the benefits of having an API and how it would help with transferring data from a specific database into the NRDD and out.

## 3. NRDD WEBSITE ANALYTICS

The NRDD website hosts the new user registration form, general NRDD information for new users, announcements, [training materials](#), technical reports, a project create/edit interface, a project summary tool, user dashboards, and QueryBuilder, a user-friendly Standard Query Language (SQL)

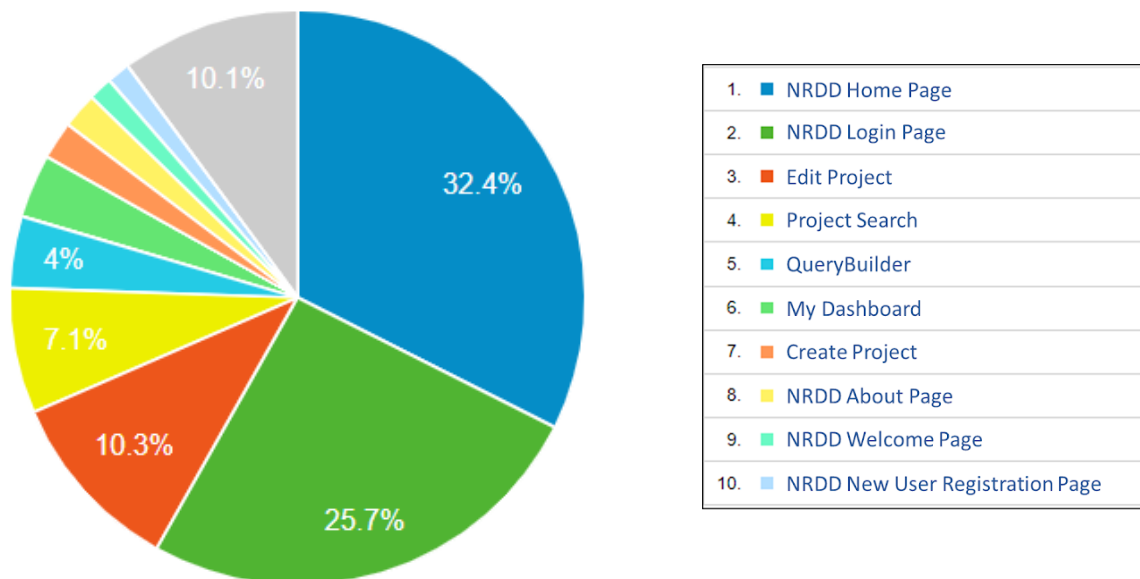
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<sup>1</sup> The Line Office Transition Managers Committee (LOTMC), through its Readiness Level Training Task Force (RLTTF) released a white paper and training module to support NOAA in its understanding and use of RLs, as currently defined in the NAO 216-105B.



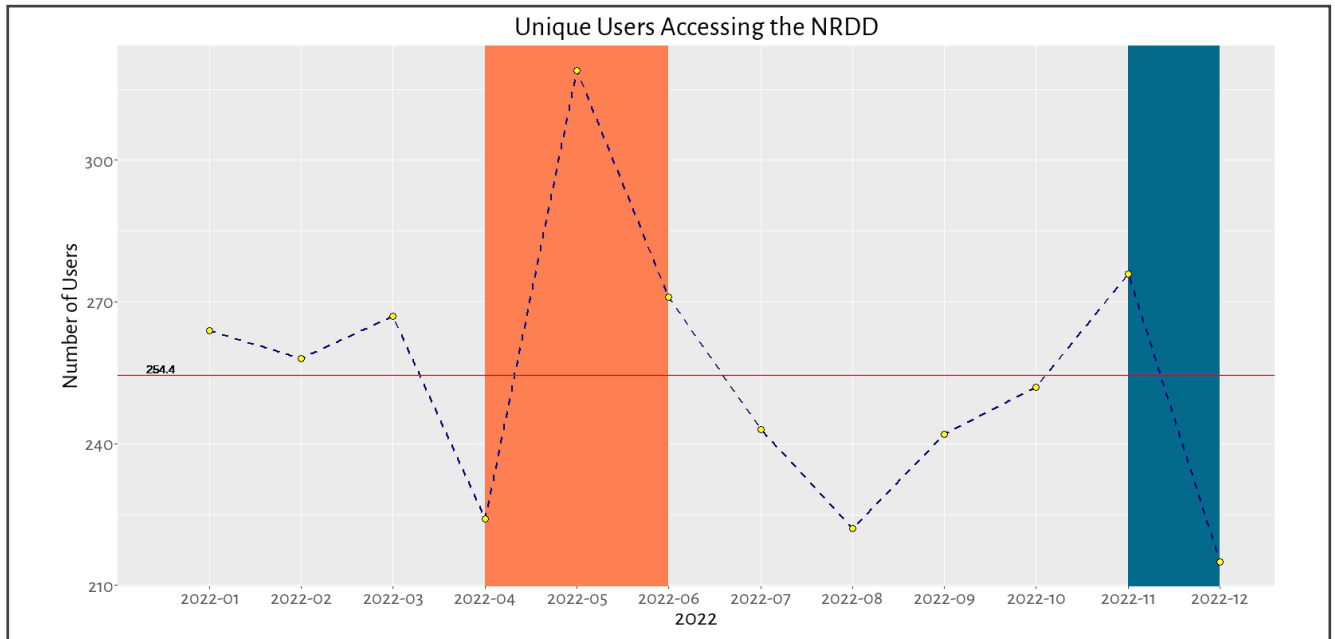
query tool that is used to connect to the database and filter and find matching projects. Through the use of Google Analytics, user engagement is tracked on the NRDD’s individual webpages to make inferences on how the system is being used.

Figure 2 displays, with respect to unique page views, the top 10 most popular webpages of the NRDD website for 2022. The page that receives the most traffic, besides the Home and Login pages, is the ‘Edit Project’ page; used for editing and uploading projects. There has been a decrease in pageviews on the editing page of the website since 2021. Unique sessions on editing dropped by almost 3.5% from 2021. This change may be attributed to the increased use of Import and Export Templates by the users, as well as an improved user interface on the website. QueryBuilder visits increased slightly by 0.7%, which may be attributed to increased use, but also may be attributed to the increase in new user accounts and activity. Overall, noting the use of import and export templates, NRDD users spend more time entering and editing data than they do extracting data.



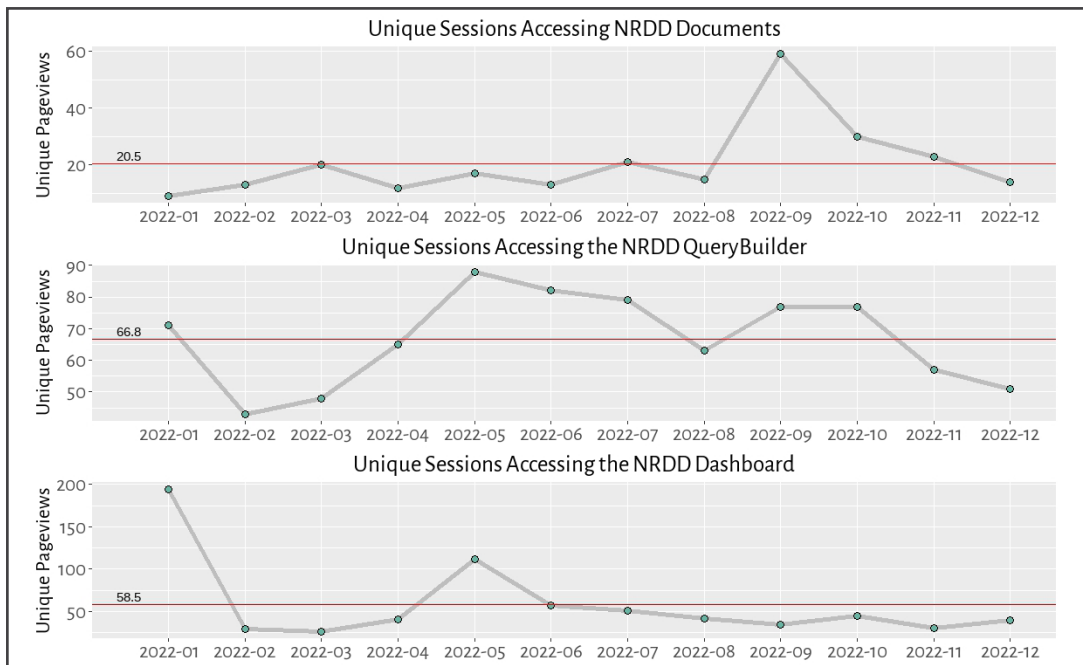
**Figure 2** (left) shows the percentage of total unique page views for the top 10 pages of <https://researchprojects.noaa.gov/>. **Legend** (right) shows the legend colors for Figure 2. Dark blue and dark green indicate the main landing and login page respectively; Grey indicates all other pages not in the top 10.

The NRDD currently has 827 registered users that have various delegated roles such as data viewers, data enterers, approvers, etc. Over the course of 2022, there has been a monthly average of 254 unique users accessing the NRDD website, a 14.4% increase from 2021 (Figure 3). It can be observed that there is a rise and fall of user access that occurs from April to June and then again in November. This can be attributed to the Planned and Actual Data calls that occur during these time periods, which require increased engagement from data enterers. User activity generally goes down during holiday seasons (i.e., the decline during summer months and December). Monthly user count can be seen as high as 319 during the middle of the Project Plans Data Call and as low as 215 during the end of the year.



**Figure 3:** Monthly count of unique users accessing the NRDD website in 2022. Red line indicates the mean value. The orange shading indicates the time period of the FY22 Project Plans Data Call and the blue shading indicates the start of the FY23 Project Actuals Data Call.

Google Analytics also collects data on how often a user accesses a webpage by aggregating numbers into unique pageviews. The NRDD Documents webpage hosts NRDD’s Annual Reports, the NRDD Field Guide, as well as current and future Operating Reports. Visits to this page are relatively consistent at an average of 20.5 sessions per month, with visits increasing in August, following the release of the previous Annual Operating Report (Figure 4). The NRDD Dashboard, one of the system developments introduced in the middle half of 2021, has averaged 58.5 sessions per month and spikes up in January. Alternatively, the NRDD QueryBuilder goes through cycles of high and low page views, averaging at 66.8 sessions.



**Figure 4:** Monthly count of unique user sessions for 3 different NRDD webpages. The red line indicates the mean value for 2022.

## 4. NRDD DATA INGEST

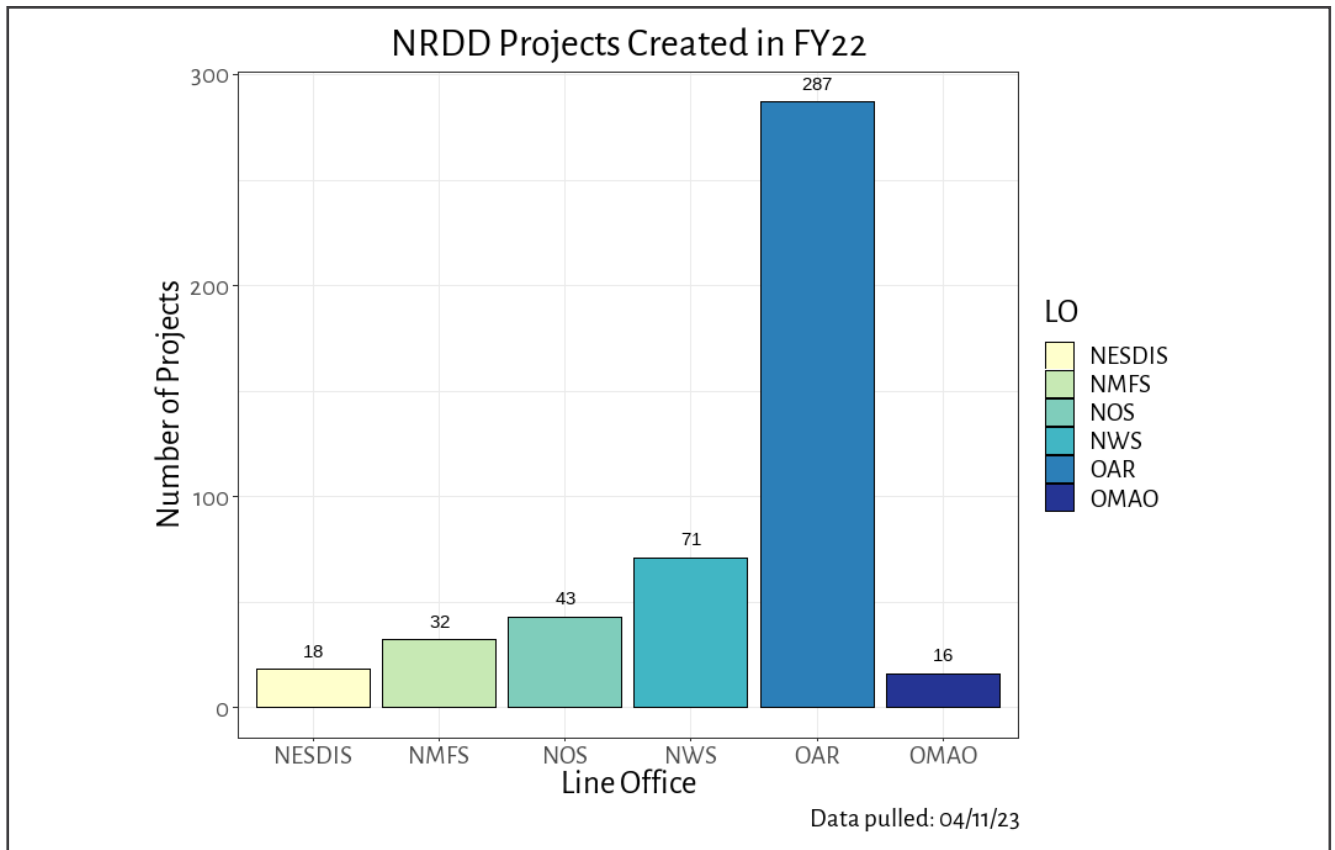
The NRDD Management Team tracks the number of imports and updates to the database to have a baseline understanding of user activity in the NRDD. Understanding where NRDD’s users are and how much data are ingested supports the team in producing solutions and mitigating issues related to data entering procedures. There are two data calls that take place during the year: the Planned Data Call, in which users provide new projects that are still in the planned stages or older projects that have not yet been entered in the database, and the Actuals Data Call, in which users go into the database and update existing project entries with actuals information including changes to Project Status, Readiness Levels (RLs), or Project Dates.

The FY22 Planned Data Call took place from April 13, 2022 to May 31, 2022 and the FY22 Actuals Data Call took place from November 1, 2022 to March 31, 2023. Not all projects are expected to have changes during the Actuals Data Call, as each project experiences a unique process and timeline. Because each Line Office can have varying levels of compliance to the NRDD, the number of updates may also vary significantly. Table 1 lists the number of projects updated by each Line Office during the FY22 Actuals Data Call and how much they contribute to the Line Office’s total portfolio. These numbers do not include new project entries made during this time period.

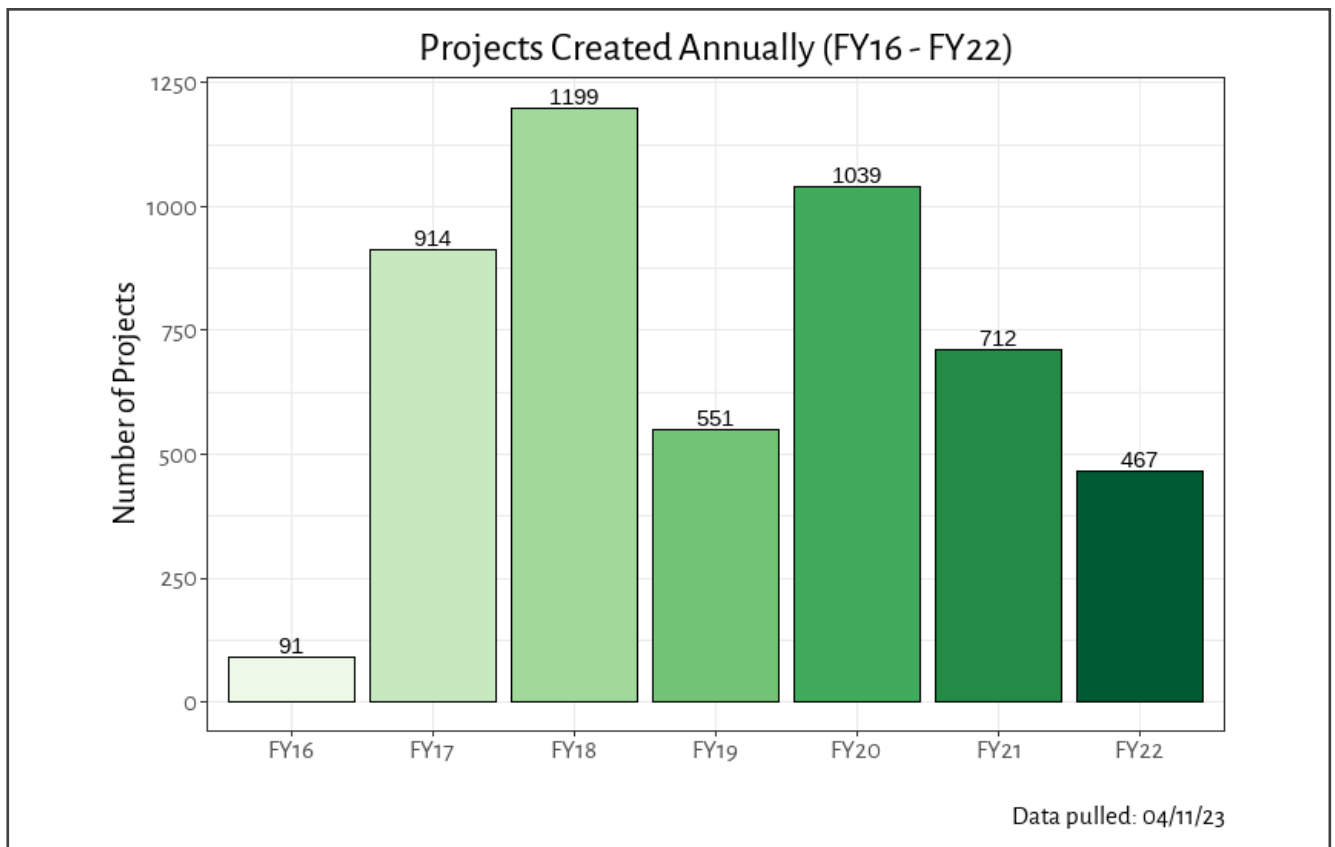
The total number of new projects provided by each Line Office in FY22 is depicted in Figure 5. Due to OAR’s larger R&D budget<sup>2</sup>, it is expected that OAR will have higher numbers of imports and exports of project information to the NRDD. Large spikes in imports and exports are usually due to ingestion of older data that had not been updated in several years. This is also visible in Figure 6, which displays the yearly distribution of all new NOAA project uploads. NRDD data ingestion goes through high and low peaks, which may be attributed to the bulk ingestion of several years’ worth of data by an office. Additionally, not all labs, programs, or offices participate in every data call. Therefore, their participation for a particular year, or lack thereof, will influence the annual numbers.

**Table 1:** Column 2 of the table reflects the total number of projects updated by each Line Office during the FY22 Data Call. Column 3 lists the total number of Line Office projects in the NRDD. Column 4 reflects the percentage of the Line Office’s portfolio updated in the FY22 Data Call.

LO	FY22 Updates to Actuals	Total Projects per LO	Percent of LO Portfolio Updated
NESDIS	161	374	43%
NMFS	85	436	20%
NOS	5	709	0.7%
NWS	353	357	99%
OAR	976	3911	25%
OMAO	5	22	23%



**Figure 5:** Number of new projects created and ingested into the NRDD in FY22 (October 1, 2021 to September 30, 2022) by each Line Office.



**Figure 6:** Number of new projects created and ingested into the NRDD for the respective fiscal year. This information was determined from project 'Creation Date'.

## 5. NRDD DATA USE

In 2022, there were eleven formal query requests to the NRDD Management Team to extract NRDD data to respond to inquiries from NOAA leadership and United States Congress. For example, a compilation of OAR projects mapped to the 2022 NOAA Arctic Priority Needs, informed the NOAA Administrator of relevant Arctic activities in order to address budget priorities. The NRDD has also been used to compile Uncrewed Systems activities across NOAA in order to report to Congress on a prioritized, agency-wide list of research and operational missions that could be performed or augmented using Uncrewed Marine Systems.

Additionally, the NRDD is used as a starting point for internal requests for information or to provide general information to other offices on partnerships and engagements across NOAA and those external to NOAA. Examples include identifying ongoing projects with France or collaborations with nations in Africa. For these requests, the project description and partner data were most utilized to match NOAA's partners with its key thematic research areas. It should be noted that as users become more comfortable using QueryBuilder, these query requests come less frequently to the NRDD Management Team, and thus cannot report on a complete accounting of queries and uses.

# SECTION III. NRDD SYSTEM DEVELOPMENTS AND ENHANCEMENTS

The NRDD database has undergone several developments and enhancements driven by the feedback received from its data enterers, approval managers, NOAA leadership, and system users. Previous records of website improvements can be found in the [2021 NRDD Annual Operating Report](#) and [2020 NRDD Systems Improvement Report](#).

## 1. NRDD DATA FIELD UPDATES AND ADDITIONS

### FUNDING BILL CHECKBOXES

Three new checkbox data fields indicating whether the projects were funded by the 2021 Disaster Supplemental, 2021 Bipartisan Infrastructure Law, or the 2022 Inflation Reduction Act were added to the NRDD system. Users can check off 'yes' or 'no' to any of the funding bills that are applicable to their project.

- Is this a 2021 Disaster Supplemental ([Public Law No: 117-43](#))?;
- Is this a 2021 Infrastructure Investment and Jobs Act/ Bipartisan Infrastructure Law ([Public Law No: 117-58](#)); and,
- Is this a 2022 Inflation Reduction Act ([Public Law No: 117-169](#))?

### STRATEGIC PLAN GOALS

Strategic plans present the goals an organization aims to achieve as well as the strategic objectives the organization will pursue to realize those goals. The inclusion of strategic plans in the NRDD enables users to select which goals or objectives their project will meet during the course of



its implementation. As the agency adopts new strategic goals, these plans are added into the database. The following three strategic plan linkages were added to the NRDD:

- DOC Strategic Plan (2022-2026)
- NOAA Strategic Plan: Building a Climate Ready Nation (2022-2026)
- NOAA R&D Vision Areas (2020-2026)

## **2. FY22 EXPORT/UPDATE TEMPLATE**

The FY22 Export Template (also known as an Update Template) enables data enterers to perform bulk updates to projects that already exist in the database<sup>3</sup>. The process works as such: an export of the existing projects from the database is given to the user in a spreadsheet format, upon request. The user then updates those projects for any progress or change made since the last update and provides the template back to the NRDD Management Team. The NRDD Management Team then imports the data to the NRDD with the support of the NRDD Development Team. The updated data then replaces all the existing data in the system.

## **3. ERROR CHECKING IMPLEMENTATION**

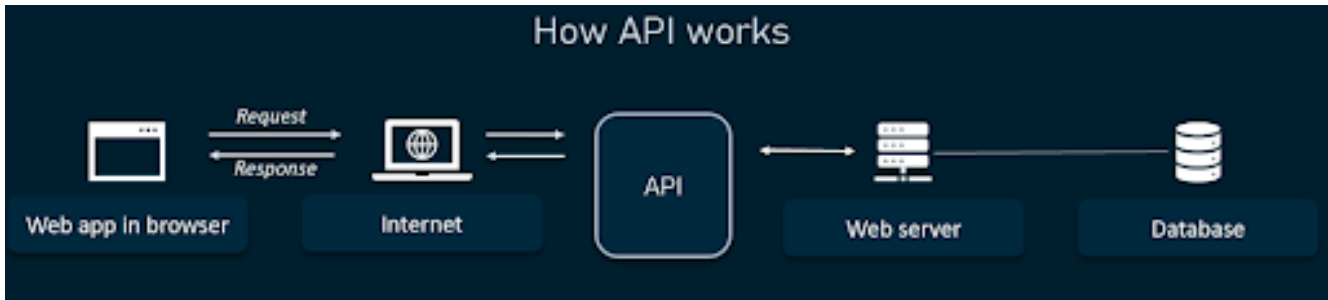
Error checking procedures are built into the NRDD data entering process for both the website and Import/Export Templates to improve the quality of the data, in its completeness, correctness, and consistency. These error checking procedures check for whether the required/mandatory data fields have been responded to or whether the data have been accurately entered. For example, an error will indicate if any required fields are missing or if the dates are not entered accurately based on the status of the project. The new implementation removes the iterative process of the error checking procedure, thus reducing the need to repeatedly engage with the data enterer. The NRDD Management Team is able to share all errors in one email. As a result, this reduces the back and forth engagements with the users and reduces the overall time it takes for data to get ingested.

## **4. APPLICATION PROGRAMMING INTERFACE (API) PROTOTYPE**

An API facilitates the transfer of data between one database and another, i.e., between Line Office data sources and the NRDD. Benefits include reducing the data entering burden on the users and removing middle party procedures during data ingestion, i.e NRDD templates. By having a direct API connection between databases, it allows for data to be pulled from one location and auto populated into a different location. The impact of an API implementation is expected to affect the time it takes for data to get from one source to another, the quality of the data in the NRDD database, as well as improve the representation of data that is in the NRDD.

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<sup>3</sup> This is different from the Import Template, which is intended for entering information for new projects only.



**Image:** An API processes a request from a user to pull data from a database and send it back to the user in a specified format. Note: Users of the NRDD API will need to be aware that an implementation of an API requires development work on the database that intends to connect and retrieve data from the NRDD.

## 5. TRANSITION PLAN EXPORTING

As a result of several requests that have come from the NOAA Science Council and the Line Office Transition Committee (LOTMC) for transition plan files, the NRDD development team started the design and development of a module that enables NRDD administrators to download the transition plans directly from the NRDD website. This module allows for the download of transition plan files using filters for Line Office and/or Project Status. It also enables the NRDD Management Team to respond directly to requests from NOAA Leadership without using additional developer assistance, minimizing the response time and developer resources.

# SECTION IV. FUTURE PLANS

The different platforms of engagement with users have informed the NRDD Management Team of additional and new ways to ease the user’s burden for engaging with the NRDD. Future plans for the system intend to reduce the time spent on data ingestion and to improve interactions with the data and interface. The following are planned developments that the NRDD management and development teams are working on:

1. **Data Validation/Automation** - Adding Data Validation to the Import Template and the Export/Update Template will enable the user to validate the data themselves, check for errors, and make corrections before submitting it for import to the NRDD. This process saves the user, the NRDD Management Team, and the NRDD Development Team significant time.
2. **Project Linking and Collaborative Projects** - Adding the capability to link R&D project entries to each other and to indicate which projects are collaborative efforts by distinguishing between funding and executive offices.
3. **Replace the Data Source for External (to NOAA) Organizations** - Currently, organizations external to NOAA are manually inputted to the database using a Google Form. Integrating a semi-automatic process by replacing the data source with the Research Organization Registry (ROR) removes the manual process of identifying the organization’s full name, type, and geographic location. This also standardizes the data. Standardized metadata, which are data that have agreed formats, spellings, and language, improve interoperability of different data systems, as well as the quality of data. Standardizing vocabularies and the data content, facilitates re-use of the data on different platforms and streamlines many data ingest processes.

4. **Batch Actions** - Allow for creating and editing of multiple R&D project entries on the website. Currently at the website, projects are created one record at a time.
5. **Textual Analysis Tool and Data Source** - Build capability for textual analysis of NRDD project metadata. The NRDD Management Team is performing market research to determine if there are commercial tools available to fulfill this need.

# GLOSSARY OF TERMS

## 1. NRDD Management Team

The NRDD Management Team manages the overall design and functionality integrity of the NRDD from a technical perspective.

## 2. NRDD Development Team

The NRDD Development Team is a team of OAR contracting developers that support the NRDD Management Team and execute the technical requirements, enhancements, and modifications necessary to maintain the database and website.

## 3. Import Template

Import is the process by which data that is submitted by the user, through the NRDD Import Template, is imported into the NRDD. The import includes coding and error checking to facilitate the data entry process.

## 4. Export Template

Export is the process by which data is extracted from the NRDD into a data file (e.g. template). The data file, template, commonly is a Google sheet or spreadsheet. The export template is primarily used to update existing project records in the NRDD.

## 5. Change Request Form

An NRDD Change Request Form is to be completed with any proposed improvements and enhancements to the NRDD system. The form requires review and approval by the NOAA RDEC

## 6. Data Call

A data call is an identified period of time to allow entry or updates to new and existing R&D project entries. NRDD data calls are issued by the NOAA RDEC twice a year, one for new project entries and the other for updates to the existing project records.

## 7. Project Definition

A project is defined as: a sequence of tasks that must be completed to attain a certain finite output. In the purview of NOAA research and development, a project is further defined as a planned effort that develops novel knowledge, or improves upon technology or otherwise aims to describe, predict, or explain some specified phenomena and includes hypothesis-driven research. A project is temporary and has a definite beginning and end. It can be managed by one or more people, depending on the complexity. Programs differ from projects in that programs contain multiple projects, though the definition of program and project will continue to be refined as enhancements are made to the NRDD on how projects can be clustered for oversight and information.

A project must have ALL of the following 4 criteria:

- I. a defined objective(s), final deliverable(s), and output(s);
- II. a defined timeline/endpoint (generally up to 4 years, but can be longer for some projects);
- III. a defined budget for the funded project (one or more of the following):
  - A. equipment and materials,

- B. personnel working on the project (FTE time or dollars), and/or
  - C. other leveraged resources (e.g., ship or aircraft time);
- IV. a single designated Readiness Level at the beginning of the project and expected Readiness Levels at the end of the project (see NAO 216-105B for the definition of Readiness Levels).

Operational systems (e.g., observing systems that are operational) are not considered R&D projects, even if effort and/or funds are spent to maintain these systems, and even if they are generating scientific data. However, each hypothesis-driven endeavor that uses the resulting data to answer a specific scientific question would be entered into the NRDD as its own project. Similarly, any effort to improve upon the operational system technology would be entered as an NRDD project.




# APPENDIX



UNITED STATES DEPARTMENT OF COMMERCE  
The Under Secretary of Commerce  
for Oceans and Atmosphere  
Washington, D.C. 20230

NOV - 2 2009

MEMORANDUM FOR: Richard Spinrad, Ph.D., CMarSci.  
Chair, NOAA Research Council

FROM: Paul Sandifer   
Senior Science Advisor

SUBJECT: Establishing Guidelines for Systematic Review and Monitoring of  
NOAA Research

As NOAA Administrator, Dr. Lubchenco regularly emphasizes NOAA's role as a science-based agency and the fundamental importance of a strong scientific underpinning for all of NOAA's activities. To ensure that NOAA science is of the highest quality and is documented in ways that will allow her to communicate objectively and accurately the importance and value of NOAA science to the Administration, the Department of Commerce, the Congress, academia, regulated and user communities, and the public at large, she has directed me, acting on behalf of the Office of the NOAA Chief Scientist, to establish consistent, agency-wide peer review and monitoring processes for all NOAA scientific activities. In considering this assignment, I have become aware that, while NOAA maintains several databases on projects and activities, we are currently lacking any consistent and standardized means to identify and track research and development programs and projects across the agency, and to ensure that they are regularly subjected to objective peer review. Therefore, under the authority of the NOAA Administrator, I am tasking the NOAA Research Council to develop:

- 1) Corporate guidance for standardizing and institutionalizing peer review procedures for all laboratories, science centers, and major research programs across the agency, as well as for the standardization of review processes for NOAA's competitive extramural R&D awards. This effort should build upon the best of our existing practices, augmented with what you may glean as good business practices from other agencies and the external community. Guidelines and data collected should enable evaluation of the quality and visibility of NOAA's science, how this science is validated and transitioned to operations or used to inform management activities. Other performance metrics to be considered include science citation indices for publications or usage statistics for NOAA science products within and outside NOAA. In addition to articles in the peer-reviewed literature, science products evaluated should include technical reports and other "gray literature," models, monitoring programs, stock assessments, and other analyses and outputs of important to our ability to accomplish the agency's missions.



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- 2) Guidance and mechanisms for standardized reporting and monitoring of all NOAA R&D activities, at least at the program level, to include total costs, major outputs and other performance measures, and where available, outcomes. The focus on outcomes should include evaluation of our current processes and progress with regard to transition of research results to application and operations.
  - 3) An annual state-of-NOAA-research report to be delivered to the NOAA Administrator by the Chief Scientist.

In carrying out this assignment, the Chair of the NOAA Research Council may request from Line Office and Goal Team representatives relevant data not currently available in NOAA databases. Line and Goal representatives are expected to comply with such requests to the fullest practicable extent.

I am further tasking the NOAA Research Council to present its work in these areas as a draft Administrative Order to the Office of the Chief Scientist as soon as practical and not later than Feb.15, 2010. I anticipate this Administrative Order will be approved by the NOAA Administrator, or the NOAA Chief Scientist acting on the Administrator's behalf, and communicated to the agency via the NOAA Executive Council.

Thank you for your cooperation in this matter.