NOAA Central Library
National Oceanic and Atmospheric Administration

NOAA Central Library

Research Services Strategic Plan

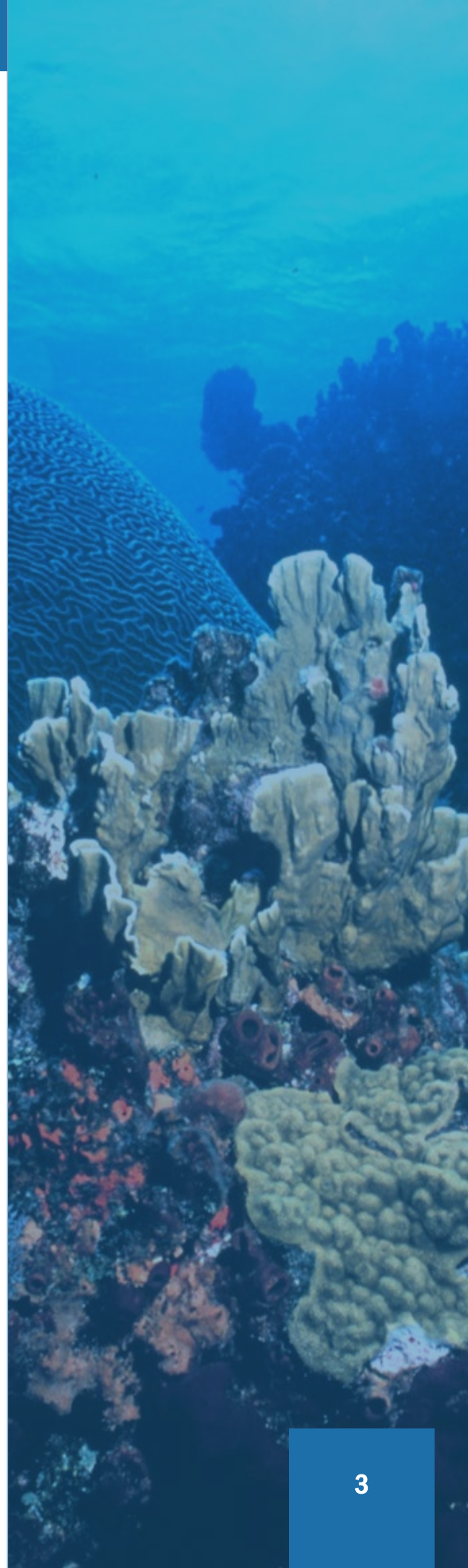**Fiscal Year 2022 - 2024**

September 2021

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MISSION

Support science, policy, and decision making by providing the highest quality research support that aligns with client needs

VISION

Instill confidence through information

INTRODUCTION

Located in Silver Spring, MD, NOAA Central Library (NCL) is the largest in the NOAA Library Network. NCL is one of six entities that make up the Office of Science Support (OSS) within the Oceanic & Atmospheric Research (OAR) Line Office. NCL serves all NOAA employees across the agency. Research Services is one of six groups within NCL alongside Resources Development, Institutional Repository, Bibliometrics, Systems, and Outreach.

PURPOSE & DRIVERS

NOAA Central Library's Research Service was launched in FY18 in order to provide research support for NOAA scientists, policy analysts, and leadership. At the time, new leadership at multiple levels within the library recognized the potential to develop support beyond the traditional reference service and ensure that the knowledge and expertise of librarians were being applied in support on NOAA's mission. The formation was also spurred on by multiple research requests in a short period of time. Since then, the Research Team has provided research support for nearly 200 in-depth requests throughout NOAA ranging from the investigation of microplastic extraction methods for bivalves to heavy fuel oil use in Arctic shipping. At the start of FY21, three years after its launch, the Research Services team embarked on the strategic planning process in order to assess priorities and focus efforts over the coming three fiscal years.

The four main drivers that led the team to engage in the strategic planning process were:

- **A NEED TO BUILD EFFICIENCIES AND CAPACITY TO SUPPORT SCALABILITY**

- **NEW PROCESSES AND TOOLS IN ENVIRONMENTAL RESEARCH**

- **A MORE COMPREHENSIVE UNDERSTANDING OF CLIENT NEEDS**

- **AN INTERNAL DRIVE TO PROVIDE THE HIGHEST LEVEL OF SERVICE**

SCALABILITY

Since its launch in FY18, Research Services has seen substantial growth year over year. Completed projects for FY21 represent an increase of over 300% compared to FY18, and the demand for services is expected to continue to grow. In a recent survey conducted by the NOAA Library Network, 53% of respondents in scientific roles said they were likely or extremely likely to use reference and research services in the future; this number increases to 60% for scientists who are in their first three years at NOAA. When asked how clients learned of the service, over half cite a colleague, mentor, or supervisor. Despite a substantial reduction of marketing in the current fiscal year, the team is working at capacity in order to manage the record number of incoming requests. As the service continues to grow, the team must prioritize the development of efficiencies as well as the building of capacity in order to continue serving NOAA at a high level. Sustainable growth requires the ability to increase output without sacrificing quality. As part of this plan a number of objectives are directly linked with scaling the service through actions that will save time, build capacity, and ensure that the service can continue to meet the needs clients.
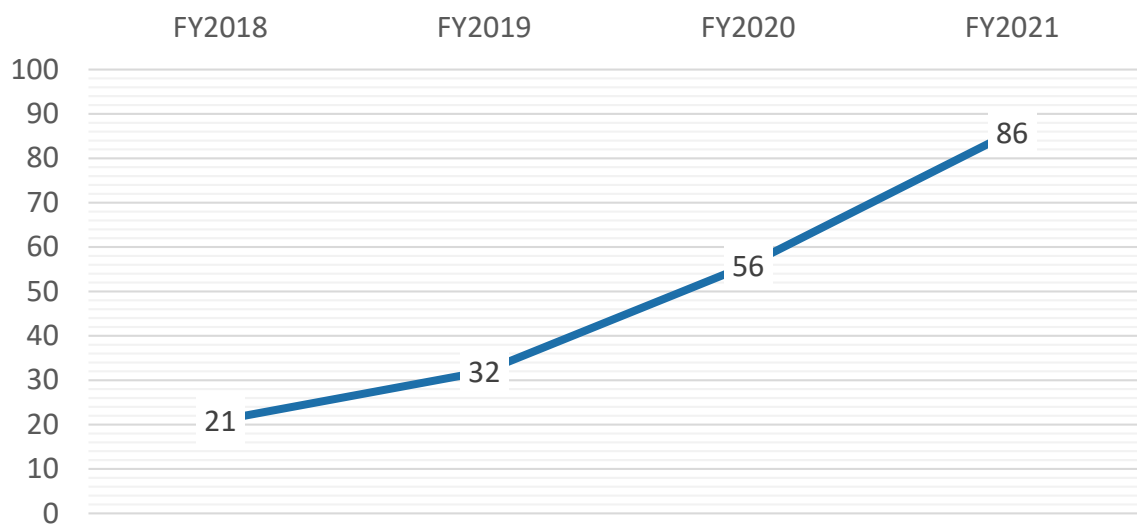
FIGURE 1: NUMBER OF REQUESTS PER FISCAL YEAR
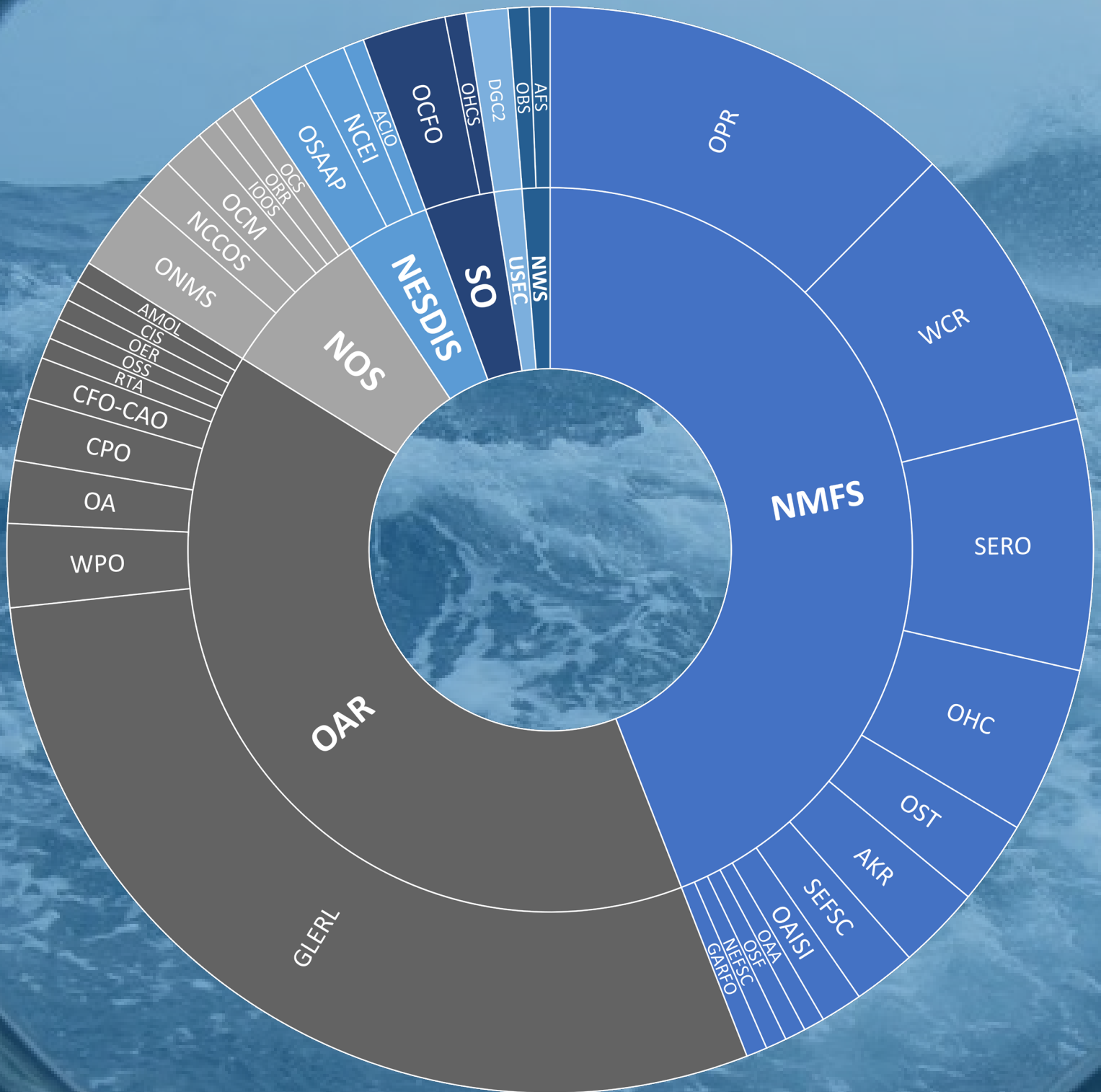
FIGURE 2: NOAA OFFICES REACHED
FY18-FY21

NEW PROCESSES & TOOLS

The research landscape is constantly evolving, especially in the areas of information identification, retrieval, and analysis. New guidelines and protocols have recently been established in order to expand the use of evidence synthesis into fields such as environmental sciences and conservation (Haddaway et al. 2017; O'Dea et al. 2021; Pullin et. al. 2020). Additionally, new text mining and machine learning tools have been developed for applications in literature searching, screening, and analysis (Grames, et. al. 2019; Howard et al. 2020; Livoreil et. Al 2017; Rethlefsen et al. 2021; Westgate 2019). This strategic plan addresses these changes in the research landscape. It focuses on the development of new processes and tools aimed at developing expertise and skill sets needed to lead NOAA researchers and decision makers, ensuring that they are using the most relevant and highest quality information.

Implementation of these new processes and tools will increase the speed at which literature can be reviewed, reduce bias in the research process, and increase the transparency of the information retrieval process. The strategic plan also focuses on ensuring that new processes and tools used for internal team communication, project management, and time savings are evaluated and integrated into the teams' workflows. Ultimately, these objectives will ensure that NOAA's research remains high-quality and reproducible.

Evidence Synthesis:
Any method of systematic identification, selection, and analysis in an effort to reduce bias and provide transparent and reproducible consolidation of information. Methods include: systematic reviews, systematic maps, rapid reviews, meta-analysis, and scoping reviews.

CLIENT NEEDS

Since its launch, the Research Services team has developed greater understanding of client needs through close working relationships. These needs vary greatly depending on the experience and skill set of clients, who come from varied backgrounds, including public policy, biological and atmospheric sciences, social sciences, and other specializations. These clients also serve in unique roles as policy and funding analysts, field and laboratory scientists, and as leaders within NOAA offices and programs. Beyond the unique questions they seek to answer, each client brings with them their own understanding of the research process.

Outside of working with clients to define and scope research questions, team members are also taking stock of the client's comfort with software as well as teaching the client about resources, processes, and best practices. It is not uncommon for a researcher to require training on specific tools, such as citation management software. The need for more training is echoed in the responses to the NOAA Library Advisory Council (NLAC) survey, where 22% of respondents selected, "Offer more training on Library resources and services," to the question of what the most important thing NOAA libraries could do to serve them better.

The Research team has also identified a need to improve the assessment of time and effort a specific project will entail. At times, client priorities shift, resulting in extended timelines that cause bottlenecks in the service. This strategic plan addresses many ways the Research Team can use its experience working with clients to make the service more responsive to actual client needs in the scoping process, services offered, and by providing options for client feedback.

HIGH LEVEL OF SERVICE

A high level of service has been at the core of Research Services since its launch. As the service continues to grow and develop, this will continue to be a core objective. In this pursuit, the team focused on a number of weaknesses and opportunities that were identified through its internal SWOT analysis as well as tacit knowledge review. This plan addresses service quality by emphasizing the establishment of documentation for internal processes in order to record institutional knowledge, improvement of marketing tools to communicate expectations, and professional development that ensures that librarians remain up to date on research trends. The plan also addresses the need to establish more rigorous internal documentation of processes and decision making in order to ensure a high level of communication internally and externally.

While the NOAA Central Library's Public Services Team will continue to provide support for a broad range of requests that it is responsible for, the Research Services Team will focus on this plan's objectives to ensure that we advance the benefits that are most meaningful to our clients and NOAA's mission.

GOALS

As a result of the strategic planning process, the following three goals were developed. Each goal has three to five associated objectives. Each goal is accompanied by a brief overview of objectives as well as an example of how the goal can be measured. Each objective is accompanied by a statement on the rationale for the development of the objective and an expectation as to how it will contribute to achieving the greater goal. Goals and objectives are also tied to the themes laid out in the introduction.

GOAL 1 - ADVANCE RESEARCH SERVICES

GOAL 2 - BUILD RESEARCH TEAM KNOWLEDGE & EXPERTISE

GOAL 3 - DEVELOP STRATEGIC PARTNERSHIPS

GOALS

ADVANCE RESEARCH SERVICES

BUILD TEAM KNOWLEDGE & EXPERTISE

DEVELOP STRATEGIC PARTNERSHIPS

GOAL 1

ADVANCE RESEARCH SERVICES

Research Services seeks to provide NOAA leadership, policy makers, program analysts, and scientists with a higher level of research support than was previously available through the integration of new processes and tools in an effort to provide the highest level of research support in line with best practices in evidence synthesis. The goal ensures that best practices are incorporated into research processes and identify training and education as a new initiative to guide researchers in the research process. It also seeks to increase the Research Teams' capacity through the building of the Team's workforce and encouraging the integration of unique and diverse perspectives. Finally, through the combination of multiple project libraries into a single database, this goal seeks to reduce the time intensive processes related to grey literature metadata creation as well as encourage the use of text mining applications across projects.

GOAL 1

OBJECTIVE 1.1 - SYSTEMATIC SERVICES

Develop and integrate processes that focus on support for evidence synthesis, reproducibility, transparency, and bias reduction.

RATIONALE

In recent years new evidence synthesis processes have been developed and applied to research in environmental and conservation sciences. Our current processes lack the rigorous documentation required to ensure reproducibility and transparency.

EXPECTATION

Through the development and application of these processes, the expectation is that our clients will better understand the importance of this process, engage in it, and be instilled with a greater sense of confidence in the resulting research findings.

DRIVERS

Scalability; New Processes & Tools; Client Needs; High Level of Service

GOAL 1

OBJECTIVE 1.2 - TRAINING & EDUCATION

Provide clients with training and education on research topics through the development of documentation, process templates, subject guides, videos, seminars, and consultations.

RATIONALE

The current one-size-fits-all approach requires the research team to complete many tasks that may either be accomplished in collaboration with clients or independently by clients.

EXPECTATION

Educational materials focused on specific processes, resources, and tools should provide researchers with the information needed to independently gather literature on their research topic.

DRIVERS

Scalability; New Processes & Tools; Client Needs

GOAL 1

OBJECTIVE 1.3 - TOOLS & TECHNOLOGY

Evaluate, recommend, and integrate new tools and technologies that advance the Research Teams' capabilities, enhance research processes, and improve internal workflows.

RATIONALE

New tools and technologies will be critical in all aspects of research services, from the internal management of research projects to the use of new text mining and machine learning techniques in support of evidence synthesis research process.

EXPECTATION

Based on the teams' previous experience and on analysis conducted by research teams at other federal institutions, integrating new tools into our workflows and processes is expected to save time and advance the Research Team's capabilities in supporting evidence synthesis.

DRIVERS

Scalability; New Processes & Tools

GOAL 1

OBJECTIVE 1.4 - WORKFORCE CAPACITY

Increase the capacity of the Research team by adding two additional full-time research librarians to the current team, communicating workforce needs with leadership, and by leveraging NOAA intern, detail, and fellowship programs.

RATIONALE

The current capabilities of the research team is limited by two main factors, the number of hours each team member is able to devote among other priorities and the experience of each team member. As the number of requests has grown, so has the number of hours required to meet these requests. Increasing demand of library services across all six sections has risen and the Research Services team is often at capacity with a long queue of requests.

EXPECTATION

The expectation of leveraging these NOAA programs is to increase the teams' capacity by bringing in additional personnel. These additional team members will be able to contribute not only by taking part in research processes, but also by providing subject matter expertise, diverse perspectives, and the ability to take on special projects.

DRIVERS

Scalability; High Level of Service

GOAL 1

OBJECTIVE 1.5 - STRATEGIC CITATION & ABSTRACT DATABASE

Build an internal citation and abstract database of grey & peer reviewed literature that is composed of material collected as a part of Research Service projects. Evaluate future use cases of this database in relation to text mining and grey literature retrieval.

RATIONALE

Over the last three years, the research team has built over 200 literature libraries for clients. Due to technical and workflow limitations these libraries are archived and maintained separately once projects are finalized.

EXPECTATION

By combining individual libraries into a single cohesive database, the expectation is that the team would see substantial time savings in grey literature metadata creation. This database is also expected to open the door to projects centered on text mining and the evaluation of research databases.

DRIVERS

Scalability; Client Needs

GOAL 2

BUILDING RESEARCH TEAM KNOWLEDGE & EXPERTISE

Research Services seeks to build internal expertise in order to lead NOAA in the use of new methods, processes, tools and technologies for searching, organizing, and analyzing texts. This goal encourages continuous exploration, knowledge exchange, and the documentation of institutional knowledge and internal processes in order to ensure that the Research Team has a strong foundation and system of support. The goal also focuses on developing a greater understanding of the Research Service's impact, which helps to ensure that the development of services provide the greatest return on investment.

GOAL 2

OBJECTIVE 2.1 - BUILDING EXPERTISE

Advance the Research Teams' understanding of trends, tools, and evidence synthesis processes through a review group which examines literature, databases, tools, and best practices in research services. (See appendix for a list of evidence synthesis resources)

RATIONALE

In order to ensure the highest quality of service the research team must have a thorough understanding of resources, tools, and trends in the area of research support.

EXPECTATION

By approaching these topics as a team, the expectation is that each member will have a baseline understanding and therefore be able to more effectively build knowledge and processes collaboratively. A team approach also ensures the input of unique and diverse perspectives.

DRIVERS

New Processes & Tools; High Level of Service

GOAL 2

OBJECTIVE 2.2 - CROWDSOURCING KNOWLEDGE

Form an informal learning and networking group of federal agency research service librarians in order to encourage sharing, learning, and support.

RATIONALE

The levels in the research support services being provided by libraries varies greatly. While academic librarians who support evidence synthesis activities have networks in which to share processes, best practices, or challenges, federal agency librarians doing similar work have no such networks for support.

EXPECTATION

Developing and participating in an informal group of federal librarians and information specialists focused on research services will give Research Team members the benefit of other's experiences and expertise, as well as allow them to contribute to other librarians' knowledge of the field.

DRIVERS

New Processes & Tools; High Level of Service

GOAL 2

OBJECTIVE 2.3 - DOCUMENTATION

Capture and organize the Research Team's specialized knowledge by documenting processes and decision making.

RATIONALE

As the Research Team develops and integrates new processes and tools it will ultimately make decisions and discoveries that shape the services. Often this information is understood and applied, but not documented. The lack of focus on documentation has at times led to miscommunication and contributes to the time required for new members to get up to speed.

EXPECTATION

As the service continues to develop, the expectation is that a focus on documentation will contribute to advancing many parts of the service, including: ensuring consistent work, supporting knowledge transfer, ensuring consistent client experience, clarifying roles and responsibilities, and supporting the sustainable growth of the Research Service.

DRIVERS

Scalability; New Processes & Tools; Client Needs; High Level of Service

GOAL 2

OBJECTIVE 2.4 - UNDERSTANDING IMPACT

Examine and implement new methods of evaluating the impact of Research Services.

RATIONALE

The client feedback collected so far has provided valuable insight into the impact and usage of the products created by the Research Team. Some kinds of impact, however, such as estimated time or money savings, have not been assessed.

EXPECTATION

This objective seeks to improve the understanding of Research Services' impact in a more holistic way, especially taking into consideration how clients would have resolved their information needs without the service.

DRIVERS

Scalability; Client Needs

GOAL 3

BUILDING STRATEGIC PARTNERSHIPS

Research Services seeks to build strategic partnerships with high information need offices, which in turn, support the advancement of the Research Service. This goal ensures that the Research Team focuses on marketing new systematic processes while integrating subject matter expertise into decisions on future service development. Partnerships are key to understanding how the Research Service fits into NOAA's research landscape, and key to the service's ongoing improvement and growth. Finally, this goal seeks to ensure that librarians throughout the Library Network have a strong understanding of Research Services and are able to effectively communicate the availability of these services with their clients.

GOAL 3

OBJECTIVE 3.1 - MARKETING FOCUS

Develop strategic marketing and communication that focus on highlighting evidence synthesis methods and their integration into research services.

RATIONALE

As the Research Team develops new research processes and integrates tools to support evidence synthesis, communication about these services will be critical. Clients need to be aware of these services and have a thorough understanding of the processes involved and their importance.

EXPECTATION

Marketing that is focused on evidence synthesis is expected to increase the understanding of its importance and use throughout NOAA.

DRIVERS

New Processes & Tools; Client Needs; High Level of Service

GOAL 3

OBJECTIVE 3.2 - SUBJECT AREA PARTNERSHIPS

Utilize our connections with clients in order to integrate subject matter/client expertise in our service development.

RATIONALE

The Research Team does not have Subject Matter Experts (SMEs) on its team. Developing strategic partnerships with SMEs can help fill the gaps in the Research Teams' knowledge and provide valuable insight into the SMEs' research fields that would not otherwise be available.

EXPECTATION

SME partnerships have the potential to provide the service with assistance with framing of marketing strategies and other communications.

DRIVERS

Scalability; High Level of Service

GOAL 3

OBJECTIVE 3.3 - LIBRARY NETWORK ENGAGEMENT

Work with NOAA Library Network to improve communication and awareness of Research Services across NOAA.

RATIONALE

Network librarians have strong connections to the offices and clients they serve.

EXPECTATION

Utilizing the network librarians' connections will help expand patron awareness of the Research Service, while also providing network librarians with the opportunity to learn about new processes and tools. This will provide opportunities to include network librarians in research activities.

DRIVERS

Scalability; High Level of Service

NEXT STEPS

Action Items and Future Strategic Plan Review

In order to ensure accountability, this strategic plan will be reviewed on an annual basis and progress in each area will be evaluated. This review will take place at the end of each fiscal year, starting with FY22. The Research Team will also meet quarterly to assess progress during the year. Furthermore, immediately following the development of this plan, the Team will develop a roadmap with action items to be performed under each objective. These action items will be integrated into the annual goal setting process undertaken by the NOAA Central Library.

ACKNOWLEDGEMENTS

Appendix: Consulted Documents

Information consulted in our process

A number of data sources were analyzed in order to help guide the Team in the development of our strategic goals and objectives. The main sources of data include the following: current literature on research services and processes (see appendix); data from the 2021 NOAA Library Network Survey; NOAA and OAR strategic plans; NOAA's Information Quality Act guidelines; NOAA's Scientific Integrity Administrative Order 202-735D-2; results from Research Team's internal Strengths-Weaknesses-Opportunities-Threats (SWOT) exercise; interviews with federal librarians at NIH, EPA, and FWS who provide research services; and finally, tacit knowledge of the research team members that was discussed during our strategic planning meetings. The following is a select list of resources that were exceptionally helpful in shaping an understanding of current practice.

Association of Research Libraries. (2015). *Issue Brief: Text and Data Mining and Fair Use in the United States.* Retrieved from https://www.arl.org/wp-content/uploads/2015/06/TDM-5JUNE2015.pdf

Bayliss, H. R., & Beyer, F. R. (2015). Information Retrieval for Ecological Syntheses. *Research Synthesis Methods, 6*(2), 136-148 https://doi.org/10.1002/jrsm.1120

Berger-Tal, O., Greggor, A. L., Macura, B., Adams, C. A., Blumenthal, A., Bouskila, A., . . . Blumstein, D. T. (2018). Systematic Reviews and Maps as Tools for Applying Behavioral Ecology to Management and Policy. *Behavioral Ecology, 30*(1), 1-8 https://doi.org/10.1093/beheco/ary130

Berrang-Ford, L., Döbbe, F., Garside, R., Haddaway, N., Lamb, W. F., Minx, J. C., . . . White, H. (2020). Editorial: Evidence Synthesis for Accelerated Learning on Climate Solutions. *Campbell Systematic Reviews, 16*(4) https://doi.org/10.1002/cl2.1128

Bethel, A. C., Rogers, M., & Abbott, R. (2021). Use of a Search Summary Table to Improve Systematic Review Search Methods, Results, and Efficiency. *Journal of the Medical Library Association, 109*(1), 97-106 https://doi.org/10.5195/jmla.2021.809

Bilotta, G. S., Milner, A. M., & Boyd, I. (2014). On the Use of Systematic Reviews to Inform Environmental Policies. *Environmental science & policy, 42*, 67-77 https://doi.org/10.1016/j.envsci.2014.05.010

Bramer, W. M., Rethlefsen, M. L., Kleijnen, J., & Franco, O. H. (2017). Optimal Database Combinations for Literature Searches in Systematic Reviews: A Prospective Exploratory Study. *Systematic Reviews, 6*(1), 245 https://doi.org/10.1186/s13643-017-0644-y

Appendix: Consulted Documents

Cheng, S. H., Augustin, C., Bethel, A., Gill, D., Anzaroot, S., Brun, J., . . . McKinnon, M. C. (2018). Using Machine Learning to Advance Synthesis and Use of Conservation and Environmental Evidence. *Conservation Biology, 32*(4), 762-764 https://doi.org/10.1111/cobi.13117

Collaboration for Environmental Evidence. (2013). *Guidelines for Systematic Reviews in Environmental Management.* Retrieved from www.environmentalevidence.org/Documents/Guidelines/Guidelines4.2.pdf

Cook, C. N., Nichols, S. J., Webb, J. A., Fuller, R. A., & Richards, R. M. (2017). Simplifying the Selection of Evidence Synthesis Methods to Inform Environmental Decisions: A Guide for Decision Makers and Scientists. *Biological Conservation, 213*, 135-145 https://doi.org/10.1016/j.biocon.2017.07.004

Cook, C. N., Possingham, H. P., & Fuller, R. A. (2013). Contribution of Systematic Reviews to Management Decisions. *Conservation Biology, 27*(5), 902-915 https://doi.org/10.1111/cobi.12114

Cooper, K., Marsolek, W., Riegelman, A., Farrell, S., & Kelly, J. (2019). Grey Literature: Use, Creation, and Citation Habits of Faculty Researchers across Disciplines. *Journal of Librarianship and Scholarly Communication, 7*(1) https://doi.org/10.7710/2162-3309.2314

Curkovic, M., & Kosec, A. (2018). Bubble Effect: Including Internet Search Engines in Systematic Reviews Introduces Selection Bias and Impedes Scientific Reproducibility. *BMC Medical Research Methodology, 18*(1), 130 https://doi.org/10.1186/s12874-018-0599-2

Demetres, M. R., Wright, D. N., & DeRosa, A. P. (2020). Burnout among Medical and Health Sciences Information Professionals Who Support Systematic Reviews: An Exploratory Study. *Journal of the Medical Library Association, 108*(1), 89-97 https://doi.org/10.5195/jmla.2020.665

Dicks LV, Haddaway N, Hernández-Morcillo M, Mattsson B, Randall N, Failler P, . . . Wittmer H. (2017). Knowledge Synthesis for Environmental Decisions: An Evaluation of Existing Methods, and Guidance for Their Selection, Use and Development. Retrieved from https://www.eklipse-mechanism.eu/apps/Eklipse_data/website/EKLIPSE_D3-1-Report_FINAL_WithCovers_V6.pdf

Doerr, E. D., Dorrough, J., Davies, M. J., Doerr, V. A. J., & McIntyre, S. (2015). Maximizing the Value of Systematic Reviews in Ecology When Data or Resources Are Limited. *Austral Ecology, 40*(1), 1-11 https://doi.org/10.1111/aec.12179

Doremus, H. (2004). The Purposes, Effects, and Future of the Endangered Species Act's Best Available Science Mandate. *Environmental Law* Retrieved from https://lawcat.berkeley.edu/record/1119487/files/fulltext.pdf

Appendix: Consulted Documents

Grames, E. M., Stillman, A. N., Tingley, M. W., & Elphick, C. S. (2019). An Automated Approach to Identifying Search Terms for Systematic Reviews Using Keyword Co-Occurrence Networks. *Methods in Ecology and Evolution, 10*(10), 1645-1654 https://doi.org/10.1111/2041-210x.13268

Gusenbauer, M., & Haddaway, N. R. (2020). What Every Researcher Should Know About Searching - Clarified Concepts, Search Advice, and an Agenda to Improve Finding in Academia. *Research Synthesis Methods, 12*(2), 136-147 https://doi.org/10.1002/jrsm.1457

Haddaway, N. R., & Bayliss, H. R. (2015). Shades of Grey: Two Forms of Grey Literature Important for Reviews in Conservation. *Biological Conservation, 191*, 827-829 https://doi.org/10.1016/j.biocon.2015.08.018

Haddaway, N. R., Bernes, C., Jonsson, B. G., & Hedlund, K. (2016). The Benefits of Systematic Mapping to Evidence-Based Environmental Management. *Ambio, 45*(5), 613-620 https://doi.org/10.1007/s13280-016-0773-x

Livoreil, B., Glanville, J., Haddaway, N. R., Bayliss, H. R., Bethel, A., de Lachapelle, F. F., . . . Frampton, G. K. (2017). Systematic Searching for Environmental Evidence Using Multiple Tools and Sources. *Environmental Evidence, 6*(1), https://doi.org/10.1186/s13750-017-0099-6

Miljand, M. (2020). Using Systematic Review Methods to Evaluate Environmental Public Policy: Methodological Challenges and Potential Usefulness. *Environmental science & policy, 105*, 47-55 https://doi.org/10.1016/j.envsci.2019.12.008

Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic Review or Scoping Review? Guidance for Authors When Choosing between a Systematic or Scoping Review Approach. *BMC Medical Research Methodology, 18*(1), 143 https://doi.org/10.1186/s12874-018-0611-x

Murphy, D. D., & Weiland, P. S. (2011). The Route to Best Science in Implementation of the Endangered Species Act's Consultation Mandate: The Benefits of Structured Effects Analysis. *Environmental management, 47*(2), 161-172 https://doi.org/10.1007/s00267-010-9597-9

Murphy, D. D., & Weiland, P. S. (2016). Guidance on the Use of Best Available Science under the U.S. Endangered Species Act. *Environ Manage, 58*(1), 1-14 https://doi.org/10.1007/s00267-016-0697-z

Murphy, D. D., & Weiland, P. S. (2019). Independent Scientific Review under the Endangered Species Act. *BioScience, 69*(3), 198-208 https://doi.org/10.1093/biosci/biz001

National Marine Fisheries Service. (2013). *Marine Fisheries Advisory Committee Recommendations for ESA Section 7 Consultations on MSA Fishery Management Actions*. Retrieved from https://media.fisheries.noaa.gov/dam-migration/mafac_report_esa_consultations.pdf

Appendix: Consulted Documents

National Oceanic and Atmospheric Administration. (2014). Information Quality Act Guidelines. Retrieved from https://www.noaa.gov/node/6009

Nie, B., & Sun, S. (2017). Using Text Mining Techniques to Identify Research Trends: A Case Study of Design Research. *Applied Sciences, 7*(4) https://doi.org/10.3390/app7040401

O'Dea, R. E., Lagisz, M., Jennions, M. D., Koricheva, J., Noble, D. W. A., Parker, T. H., . . . Nakagawa, S. (2021). Preferred Reporting Items for Systematic Reviews and Meta-Analyses in Ecology and Evolutionary Biology: A Prisma Extension. *Biological Reviews of the Cambridge Philosophical Society* https://doi.org/10.1111/brv.12721

O'Mara-Eves, A., Thomas, J., McNaught, J., Miwa, M., & Ananiadou, S. (2015). Using Text Mining for Study Identification in Systematic Reviews: A Systematic Review of Current Approaches. *Systematic Reviews, 4*(1), 5 https://doi.org/10.1186/2046-4053-4-5

O'Mara-Eves, A., Thomas, J., McNaught, J., Miwa, M., & Ananiadou, S. (2015). Using Text Mining for Study Identification in Systematic Reviews: A Systematic Review of Current Approaches. *Systematic Reviews, 4*(1), 5 https://doi.org/10.1186/2046-4053-4-5

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., . . . Moher, D. (2021). The Prisma 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. *BMJ, 372*, n71 https://doi.org/10.1136/bmj.n71

Premji, Z., Hayden, K. A., & Rutherford, S. (2021). Teaching Knowledge Synthesis Methodologies in a Higher Education Setting: A Scoping Review of Face-to-Face Instructional Programs. *Evidence Based Library and Information Practice, 16*(2), 111-144 https://doi.org/10.18438/eblip29895

Pullin, A., Frampton, G., Jongman, R., Kohl, C., Livoreil, B., Lux, A., . . . Wittmer, H. (2016). Selecting Appropriate Methods of Knowledge Synthesis to Inform Biodiversity Policy. *Biodiversity and Conservation, 25*(7), 1285-1300 https://doi.org/10.1007/s10531-016-1131-9

Pullin, A. S., Cheng, S. H., Cooke, S. J., Haddaway, N. R., Macura, B., McKinnon, M. C., & Taylor, J. J. (2020). Informing Conservation Decisions through Evidence Synthesis and Communication. In *Conservation Research, Policy and Practice.* J. A. Vickery, N. Ockendon, N. Pettorelli, P. N. M. Brotherton, W. J. Sutherland, & Z. G. Davies (Eds.), (pp. 114-128). Cambridge: Cambridge University Press https://doi.org/10.1017/9781108638210.007

Rethlefsen, M. L., Kirtley, S., Waffenschmidt, S., Ayala, A. P., Moher, D., Page, M. J., . . . Group, P.-S. (2021). Prisma-S: An Extension to the Prisma Statement for Reporting Literature Searches in Systematic Reviews. *Systematic Reviews, 10*(1), 39 https://doi.org/10.1186/s13643-020-01542-z

Appendix: Consulted Documents

Roth, S. C. (2018). Transforming the Systematic Review Service: A Team-Based Model to Support the Educational Needs of Researchers. *Journal of the Medical Libry Association, 106*(4), 514-520 https://doi.org/10.5195/jmla.2018.430

Saran, A., & White, H. (2018). Evidence and Gap Maps: A Comparison of Different Approaches. *Campbell Systematic Reviews, 14*(1), 1-38 https://doi.org/10.4073/cmdp.2018.2

Shaffril, H. A. M., Samah, A. A., & Samsuddin, S. F. (2021). Guidelines for Developing a Systematic Literature Review for Studies Related to Climate Change Adaptation. *Environmental Science and Pollution Research*, 1-13 https://doi.org/10.1007/s11356-021-13178-0

Spencer, A. J., & Eldredge, J. D. (2018). Roles for Librarians in Systematic Reviews: A Scoping Review. *Journal of the Medical Libry Association, 106*(1), 46-56 https://doi.org/10.5195/jmla.2018.82

Tchangalova, N., Harrington, E. G., Ritchie, S., Over, S., & Coalter, J. (2020). Working across Disciplines and Library Units to Develop a Suite of Systematic Review Services for Researchers. *Collaborative Librarianship, 11*(4) https://digitalcommons.du.edu/collaborativelibrarianship/vol11/iss4/6/

Townsend, W. A., Anderson, P. F., Ginier, E. C., MacEachern, M. P., Saylor, K. M., Shipman, B. L., & Smith, J. E. (2017). A Competency Framework for Librarians Involved in Systematic Reviews. *Journal of the Medical Libry Association, 105*(3), 268-275 https://doi.org/10.5195/jmla.2017.189

U.S. Fish and Wildlife Service, N. M. F. S. (2006). 5-Year Review Guidance: Procedures for Conducting 5-Year Reviews under the Endangered Species Act. Retrieved from https://media.fisheries.noaa.gov/dam-migration/guidance_5_year_review_2006.pdf

Walsh, J. C., Dicks, L. V., & Sutherland, W. J. (2015). The Effect of Scientific Evidence on Conservation Practitioners' Management Decisions. *Conservation Biology, 29*(1), 88-98 https://doi.org/10.1111/cobi.12370

Westgate, M. J. (2019). Revtools: An R Package to Support Article Screening for Evidence Synthesis. *Research Synthesis Methods, 10*(4), 606-614 https://doi.org/10.1002/jrsm.1374

Westgate, M. J., & Lindenmayer, D. B. (2017). The Difficulties of Systematic Reviews. *Conservation Biology, 31*(5), 1002-1007 https://doi.org/10.1111/cobi.12890

Westgate, M. J., Haddaway, N. R., Cheng, S. H., McIntosh, E. J., Marshall, C., & Lindenmayer, D. B. (2018). Software Support for Environmental Evidence Synthesis. Nature ecology & evolution, 2(4), https://doi.org/10.1038/s41559-018-0502-x

Appendix: Consolidate SWOT

Strengths

- Research Services showcases the expertise of librarians as subject matter experts in information retrieval
- Research Services provides time savings and money for clients and offices
- The Research Team is proactive, creative, and engaged
- Research Services has had a high level of positive feedback
- Research Services is supported by Library and OSS leadership
- Research Services provides unparalleled support in gathering literature at NOAA
- The Research Team is able to support the library's collection development and technology acquisitions due to it's unique knowledge of user needs

Weaknesses

- The nature of research support leads to inconsistent timelines and workloads
- Research Services lacks tools for project management leading to communication deficiencies
- Services are too flexible for project timelines and end-products
- Team members are often stretched between library teams which leads to competing priorities
- Institutional knowledge is necessary and "coming up to speed" takes a long time
- The Research Services team does not have any subject matter experts
- Value of our service is not understood (by new/potential clients) Value to client is difficult to quantify

Opportunities

- The team can lead NOAA in a number of areas such as evidence synthesis and the application of new tools
- Better understanding the time/money savings as well as gathering qualitative value statements
- Development of onboarding & training material in the process of new workflow and processes development
- EndNote library can serve as a research library for grey literature and articles relevant to requested research
- Develop expertise in text mining for use in evidence synthesis processes

Threats

- Client offices can contract out services if the Research Services team is not able to provide support
- Losing a single team member would have a major impact on the ability to maintain current growth.
- Growth throughout library services may lead to further competition internally for workforce and priorities
- Inability to procure critical resources or loss of database access due to budget changes

Appendix: Evidence Synthesis Resources

The following list of organizations, events, and resources are focused on the development and application of evidence synthesis. In an effort to maintain up to date knowledge on new tools and processes the Research Team will continue to scan these sources for news and information that can be applied to the development of our services and training.

- Collaboration for Environmental Evidence (CEE)

- Campbell Collaboration

- The Cochrane Collaboration

- Evidence Synthesis Hackathon Annual Conference

- ePPI Centre

- Systematic Review Toolbox

- PRISMA

- #ESTraining

- Evidence Synthesis Institute (pressbook)

- National Academies' Committee on Reproducibility and Replicability in Science

- PROSPERO

- The EQUATOR Network