



NET GAINS ALLIANCE

IMPROVING NET GAINS: PAST, PRESENT AND FUTURE

DECEMBER 2020



INTRODUCTION

Modern fishery information systems are critical to achieving the full potential of the United States' fisheries. Four years have passed since the Fishing Data Innovation Taskforce, a diverse coalition of fishery stakeholders, issued recommendations to elevate and address the most pressing data modernization needs. The resulting 2017 Improving Net Gains report spurred the creation of the Net Gains Alliance (NGA), an initiative to advance these recommendations through grant-making, convening, policy engagement, and constituency building. The Improving Net Gains report was also a driving force behind the NOAA National Marine Fisheries Service (NMFS)' recent release of the Fisheries Information Management Modernization (FIMM) Technical Memorandum, which demonstrates the Agency's commitment to data modernization. This NGA retrospective reflects the progress and challenges NGA has seen to date as we begin a process to look ahead and envision what could be next.

NGA believes that modern data systems are essential for sustainable fisheries and ocean management, and that public-private partnerships can accelerate the transition to faster, more accurate, and more reliable fisheries information systems. Since its inception, NGA has worked to serve as an independent, trusted convener and thought partner to managers and fishery stakeholders on data modernization challenges. NGA hosted discussions on critical topics including managing electronic monitoring data, bringing together a wide range of participants to explore technical and policy issues. NGA conducted two rounds of grant-making in 2019 and 2020, directing more than \$1 million to projects that have empowered our grantees to make strategic progress on key data modernization challenges around the country. The first round of projects is beginning to yield valuable contributions including a guide to people-centered product development in a fisheries context and resources for facilitating data sharing conversations and agreements. NGA's 2020 slate of projects will break new ground by developing models for community-centered data sharing, proposing a regulatory framework to support technology and innovation, supporting dialogue between EM service providers to advance interoperability, and exploring how advances in computer science and data management can fulfill confidentiality requirements while facilitating data sharing.

The last four years have brought major technological changes to all sectors of society and fisheries were no exception. The implementation of electronic technologies in fisheries continues to expand steadily, including tools like electronic reporting (ER) and electronic monitoring (EM). NOAA's National Marine Fisheries Service (NMFS), service providers, and researchers are applying artificial intelligence and machine learning to fisheries issues, including species identification and activity recognition.

We've seen increases in data solutions both high and relatively low tech, from cloud and edge computing that puts complex analyses in scientists' and fishers' hands faster, to Optical Character Recognition-friendly forms and vessel trackers. All of these technologies require improvements in the underlying data systems that aggregate, share, and store this growing volume of data.

Over the last four years, NMFS has made strides toward managing data as a strategic asset, through the Agency's responses to the Federal Data Strategy and Action Plan and the Foundations for Evidence-Based Policymaking Act and by fostering an institutional culture that values data literacy, data modernization, and effective information management policies. Most notably, in September 2020 NMFS released recommendations from the 2019 Fisheries Information Management Modernization (FIMM) workshop, a direct response to the Improving Net Gains report. NGA commends the Agency's release of these recommendations and commitment to invest in the governance framework, policies and procedures, human resources, and technology to further modernize our fishery information system and respond to future needs.

Modernizing our Nation's fishery data systems is an ongoing endeavor. The Net Gains Alliance continues to look ahead and envision the possibilities of a data-driven future that realizes the full potential of our fisheries. In 2021, NGA will continue to collaborate with regulators, industry, and other fishery stakeholders and develop an updated set of recommendations to guide the next iteration of data modernization and improvement efforts. This new vision will draw on what we've learned over the past four years, while also taking a fresh perspective on what a data-driven future could look like.

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As we begin crafting that new vision, we prepared this retrospective to revisit the recommendations and ideas of our original report. While we believe it is timely to craft a new vision for success, the recommendations and visions of success described in the original Improving Net Gains report are ongoing aspirations that will continue to guide our work on data modernization. The reflections shared in this

retrospective include our expert team's perspectives and opinions, with input from the Net Gains Advisory Panel and our broader network of partners and grantees. We hope this retrospective encourages appreciation for the work that has been accomplished and renewed energy to identify and tackle the next iteration of data modernization priorities.

I. Recommendations and Action Items

The Improving Net Gains report included six specific recommendations for NMFS leadership and the Administration to gain traction on challenges and make progress toward our vision for the future. Overall, we believe NMFS is making progress against our initial action list. The table below includes our assessment of the progress made toward each recommendation.

Some of the progress toward these action items was driven in part by two major Administration-wide data initiatives that occurred after 2017: the initiation of the Federal Data Strategy, and the first stages of implementation for the 2018 Foundations for Evidence-Based Policymaking Act. These created new directives for NOAA and NMFS and shaped the larger landscape for the agencies' data efforts, setting targets and standards across Departments. Some of the "Policy, Product, People, and Process" recommendations of our early report have been subsumed by these larger efforts.

	2017 Recommended Actions	2020 Status
1	The modernization and streamlining of fishery information systems should be identified as a national priority by the incoming NOAA Administrator.	The focus on data improvements NOAA-wide bolstered activities at NMFS to advance data modernization. In 2021 we hope Agency leadership will recommit to this work and recognize data modernization as an explicit priority.
2	Utilize all available technology partners, including public (e.g. the U.S. Digital Service), and private sector expertise, to meet fishery data modernization goals.	We have seen moderate levels of engagement with private consultants on assessing modernization opportunities, and more limited interactions with other agencies or the Technology Transformation Service. While NMFS has cultural and technical concerns specific to its fisheries mandates, the agency should continue to seek best practices from outside and not reinvent the wheel.
3	Conduct an external cross-regional assessment that identifies and makes recommendations based on need and best practices.	The FIMM process included an internal assessment of staff and data partners to identify areas for improvements, and the 2020 FIMM Technical Memorandum provides a roadmap of investments and actions. It remains to be seen if and how well this roadmap will produce action and lasting changes.
4	Release a national data modernization policy and associated budget initiative.	See above; we believe the FIMM process is responsive to both of these recommendations.
5	Update data confidentiality requirements to provide clear and consistent guidance and enable access by scientists, managers, and, where appropriate, the public.	This work remains to be done, and the Net Gains Alliance plans to support efforts in this area in the coming year.
6	NMFS and state agencies should increase education and outreach around fishery information systems to support greater stakeholder engagement in modernization.	To the extent that educational efforts are happening they are often on a project by project basis, at the regional, science center, or FIN level. The National Electronic Monitoring workshops are an example of supporting cross-regional dialogue. External collaborations, such as partnerships with EM4Fish, are also helping to facilitate cross-regional information sharing.

II. What We've Learned

The Improving Net Gains report proposed the following six visions for the future to illustrate what successful modernization and streamlining of fishery information systems might look like in practice. Elements of these visions have guided NGA's policy engagement, convening, and selection of project grants. Our understanding of these issues has evolved with experience and hindsight. The NGA team has identified the following lessons learned based on this initial vision and our work of the past several years.

Data Streamlining

The Improving Net Gains report identified the need for simple, efficient reporting. Although this objective was originally framed as "one-touch" reporting, the term "streamlining" better captures the range of opportunities to improve reporting in ways that benefit data providers and data users. Streamlining can include front-end improvements, such as making user interfaces simpler and more intuitive. For example, in 2019 NGA supported a project with the NMFS Northwest Fisheries Science Center to apply user-centered design to new applications for west coast groundfish fisheries. Streamlining can also include back-end improvements to data storage, organization, and integration across sources. Looking ahead, we believe it's important to continue making progress toward unique trip identifiers to consolidate and streamline reporting requirements. We also think it's important to adopt a user-centered design approach to develop software and products that are simple and intuitive to use.

Cross-regional Learning

The federated structure of our fishery management system encourages regional innovation and problem solving, but can also lead to slow progress and duplicative efforts. In the next few years it will be more critical than ever to leverage regional experience into nationwide progress as regions transition to cloud-based data platforms, explore the utility of machine learning and artificial intelligence, plan for high-volume data, and implement a regional and national data governance framework. Cross-regional learning is also critical for advancing principles of user-centered design, and working through emerging interests including community-centered data management platforms. NMFS has helped support cross-regional learning through the Fisheries Information System Program and Professional Specialty Groups. NGA creates new opportunities for dialogue through our policy engagement, webinars, and constituency building; as well as by encouraging our grantees to build stakeholder engagement into their projects and to create resources such as guides and frameworks that can be shared across regions. We need to continue supporting a community of practice that empowers data modernization champions, including NMFS and other stakeholders, to learn and build on shared experience.

Government-Private Sector Communication

Progress toward widely available, high-performing, and affordable technology requires communication between the private sector and government, so that each understands the other's responsibilities and needs. This is particularly apparent in the area of electronic monitoring, where the challenge of scaling and implementing a growing number of EM programs reinforces the need for performance-based standards that can enable service providers to innovate, compete, and provide cost-effective services. The need to shift to performance-based standards that specify what data must be collected and in what format, as opposed to prescribing system details, is well recognized but has not occurred. We've learned that this is an area where NGA is uniquely situated to catalyze progress.

In 2020 we are funding two projects that will directly address this need by supporting dialogue among EM service providers to advance interoperability and alignment on standards, and by developing a model regulatory framework to support fisheries technology and innovation.

Data Access and Literacy

Fishery stakeholders are rapidly improving their data literacy, building their capacity to advocate for their data interests and drive innovation. The implementation of electronic technologies has helped drive this growth, as stakeholders explore questions and concerns about data access and privacy. We have also seen growing industry interest in accessing their fishery-dependent data in a useful and timely format. We've learned that this is another area where NGA, as a trusted and independent external partner, is able to spur progress through dialogue on some of the most intractable issues related to data access, data sharing, and confidentiality.

Data Visioning and Strategy

We have observed that while there is a growing body of guidance, structure, and strategy to data improvement and modernization efforts, there is still often an unmet opportunity to step back and articulate our aspirations for data collection. Some data system improvement projects are motivated by opportunities (e.g., improving efficiency) while others are in response to challenges or problems (e.g., software end-of life), but most are constrained by the time, resources, and personnel that can be invested in a process. The idea of "visioning" proposes that a thoughtful, deliberate process

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can not only support a successful outcome, but provide added benefits that include building data literacy rather than against--the cultural and human foundations of data systems that can be some of the most significant barriers to change. NGA is supporting a project to examine the attributes of successful data improvement projects to advance the concept of data visioning, and share strategies for leading successful data system improvement projects.

Defining and Measuring Success

It's more critical than ever to tell compelling stories about why data modernization matters and have a shared vision of success. One of NGA's core goals is building the constituency for data modernization and sharing success stories, and we are continually reminded that the value of data modernization can be a challenging story to tell. The importance of data modernization is often made most apparent when our data systems fall short of meeting our needs and answering our questions. It's also challenging to link data and data system improvements with tangible outcomes, especially for complex objectives like government efficiency or industry profitability and access. This task becomes even more critical and challenging when making the case to invest in long-term maintenance and infrastructure needs, and proactive efforts such as preparing for a high-volume data future. We've confirmed that NGA can be an influential champion and storyteller and will continue and enhance our efforts to define success and celebrate progress.

Final Reflections

Data modernization and digital transformation are a process, and NMFS has just begun the latest steps in this journey. While we're pleased to be able to reflect on the progress the fisheries community has made since our 2017 report, a tremendous amount of work remains to be completed and we must achieve even broader engagement in defining and working towards the next round of goals. As part of that effort, in the coming months, we will lead a collaborative visioning process to bring further definition to those goals. NGA looks forward to continuing our unique role as an independent, trusted convener and thought partner to NMFS, Fishery Information Networks, the Regional Fishery Management Councils, and the fisheries community as a whole to enable data-driven, sustainable fisheries and ocean management in the United States.

This report was prepared by the NGA Core Team - George Chmael, George Lapointe, Katie Latanich, Dorothy Lowman & Kate Wing, with input from the NGAP and other experts.