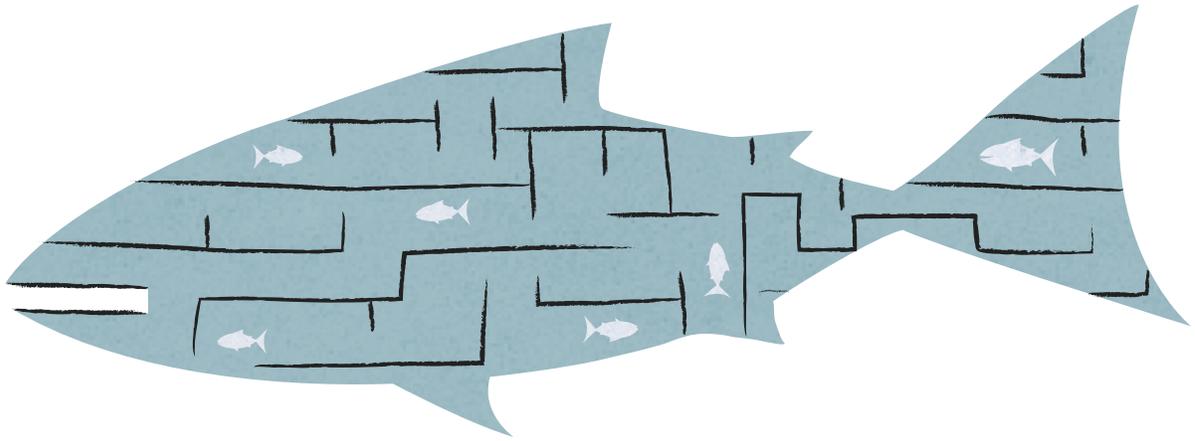


Accelerating Government Fisheries Data Modernization



SNAPSHOT: WHERE WE ARE TODAY

The Information Age is here, but data-rich fisheries continue to be a rarity around the world. Instead, we see fisheries defined by limited information and limited application of that data for effective management. Such poor data usage results in flawed catch limits, a lack of reliable forecasting or enforcement, little to no accountability or transparency, and the inability to meet demands for adaptive management and sustainable fisheries.

Today, efforts to improve fisheries data are underway, ranging from tech-driven solutions to coalitions focused on standard-setting to policy improvements. But these developments are not producing enough change on and in the water. This lack of progress can be attributed in large part to a lag within governments.

Even with strong incentives—such as gaining market access or avoiding bad press—the seafood industry has taken years and continues to struggle to adopt best data practices within its supply chains. Compared to industry, governments are moved by different and more complex concerns, such as improving livelihoods or economic security. Fisheries data modernization efforts have not yet effectively aligned with meeting these needs, limiting progress. Government uptake of fisheries data modernization is further slowed by limited resources, insufficient training, and outdated technology. Under

these conditions, governments cannot generate or apply better data to support robust fisheries management.

In early 2019, Future of Fish undertook a scoping exercise to:

1. **DEFINE** government data modernization;
2. Explore what is **WORKING**, and where things are getting **STUCK** with government fisheries data modernization efforts; and
3. **IDENTIFY OPPORTUNITIES** that could advance government data modernization in fisheries at a global scale.

Future of Fish invites feedback on these preliminary findings and looks forward to hearing from those interested in collaborating to progress this important work.

WHAT IS GOVERNMENT DATA MODERNIZATION?

We interviewed practitioners in the fisheries data modernization space to hear what they considered to be critical aspects of “data modernization.” Based on this research, Future of Fish proposes the following working definition of government data modernization:

Any initiative or process that results in more relevant and accurate data, and/or more efficient and timely data delivery and analyses that support both improved governance (management, science, and enforcement) and serve industry and public needs.

While this definition of government data modernization is agnostic to any sector, the focus of this research is on government modernization for fisheries data and management purposes.

WHAT DOES GOVERNMENT DATA MODERNIZATION ACHIEVE?

Effective data modernization in the government fisheries context results in three outcomes:

RELEVANT AND ACCURATE DATA, which includes data quality assurance and quality control.

APPLICATION OF THAT DATA for effective fisheries management, which requires data to be delivered and analyzed at a rate rapid enough to support timely enforcement and responsive, data-driven decision-making.

DELIVERY OF BENEFITS to industry/communities as well as governance bodies, meaning the intelligence generated by these improved systems is made available and accessible to sectors beyond just government. For this last component, the general public is included as a key stakeholder, with *select* fisheries data shared for the benefit of society.

MODERNIZATION IS NOT THE SAME AS NEW TECHNOLOGY

Data modernization is not limited to technological improvements. For example, improved protocols for data capture and sharing in paper-based systems count as modernization if those protocols facilitate better management and insight for industry. Updated decision-making processes or improved analytics also count as “modernization.”

One of our most important findings is that effective modernization requires consideration of critical factors such as relationship dynamics, cultural factors, learning curves, and work habits. In other words—the human elements of the system. Other reports, especially looking at technology adoption, have come to similar conclusions. For government fisheries data modernization, investment in efforts that identify appropriate incentives for attracting participation, cultivating in-house expertise, and training to address data sharing and ownership concerns, are critical to success but often lacking.

While electronic systems and better technology can deliver increased data QA/QC needed for robust management, we found a substantial need for more investment into setting broad strategy and applying user-focused design prior to creating or integrating any new software or hardware. The creation and support of flexible, data-driven policies that can accommodate the dynamic data modernization sector is also critical for long-term success.

For resource-strapped governments in particular, a clear strategy with which to design and implement data modernization is critical in order to: 1) **Mitigate risk** of wasted resources on projects that are not aligned with local cultural values, existing core infrastructure, situationally appropriate data systems, or functional internal capacity; 2) **Leverage momentum** from successful programs to engage stakeholders and secure additional resources quickly and efficiently; and 3) **Benefit from economies of scale** by using learnings and elements of systems tested and built in one fishery for other fisheries (or even other sectors of the economy).

WHAT'S STOPPING GOVERNMENT DATA MODERNIZATION IN FISHERIES?

To better understand what is working well and where things become stuck in the government fisheries data modernization process, we looked across eight different case studies around the world. Using a global lens, we distilled patterns in how the modernization process unfolds across geographies, including key attributes to consider within effective design.

STAGES OF PROGRESS

We found that government fisheries data modernization projects generally progress through four stages:

1. **INITIATE.** An idea is ignited and then socialized to garner interest, engage experts, and secure support for a testable pilot or working draft. Alignment of ideas with existing management strategies or science, or creation of a holistic data strategy, needs to occur in this stage. This is a critical missing piece for the majority of initiatives.
2. **PILOT.** The idea moves from theory to testable prototype. For technology-focused initiatives, this stage is often a pilot project; for policy developments, it may be initial drafts or committee meetings. This is where robust design—including how to scale success—is needed but often overlooked.
3. **ESTABLISH.** The initiative or program takes root and becomes embedded in the day-to-day of an agency or individual's workload. This stage is dependent on allocating sufficient resources past a pilot phase, either by the government or through outside support.
4. **SCALE.** The modernization effort is refined, replicated, or applied in a novel context. This may mean expansion of a technology to a new fishery, or using a new analysis that increases the value generated by existing data. New ideas generated here may loop back to the "Initiate" stage. Scale can also occur when a solution is replicated in other fisheries or geographies without the need for further testing or refinement. Few examples of this stage appear to exist at the present time due in large part to the lack of overarching strategy.

CRITICAL DESIGN ATTRIBUTES

We identified six attributes within each stage that are important to account for when designing and implementing initiatives:

1. the **PRIMARY DRIVER** or catalyst that gives the industry initiative the initial or additional momentum required to maintain forward progress,
2. the **ENABLING CONDITIONS** that nurture and support the progress of an initiative,
3. appropriate and sufficient **FUNDING**,
4. the type of **LEADERSHIP**, which changes with each stage, that motivates participation and attracts key stakeholders,
5. **TOOLS** including reports, toolkits, platforms and guides, and
6. consideration of **TIMEFRAME** that allows for expectation management and appropriate budgeting.

Each of these attributes can take on many different versions, and understanding what the combination is for one fishery system can help practitioners design, plan, and implement an appropriate strategy and approach to modernization.

THE BENEFITS OF HOLISTIC STRATEGY AND USER-FOCUSED DESIGN

More often than not, we found that Stage 1 was dominated by a rush to implement. Few to no resources are spent on long-term planning and strategy-building. There is little consideration for how to move from pilots into more permanent solutions or how to build off investments in pilots to replicate to other fisheries. As a result, governments all struggle with several common conditions that slow or prevent success. These include lack of long-term finance and change management strategies which could help pilots grow into more permanent, scaled solutions; policies that inadvertently prevent use of better data and thwart more efficient process; and internal confusion and competition around data ownership that blocks progress.

The failure of governments and funding bodies to prioritize development of holistic strategies and apply user-focused design to implement those strategies is a global, systemic barrier that cripples progress and limits scale.

WHAT'S NEXT? OPPORTUNITIES FOR PROGRESS

Modernization of government fisheries data systems offers great opportunity for advancing sustainable fisheries: when coupled with appropriate fisheries management frameworks, a robust data system enables effective fisheries science, management, and enforcement by providing accurate and timely information flow across governance divisions. With smart design, these systems can also return valuable information to the seafood industry and fishing communities, providing positive incentives for collaboration and participation.

The following section highlights some of the opportunities that appear ripe for development, along with a selection of best practices that we distilled from the case studies.

1: IDENTIFY AND APPLY INCENTIVES ATTRACTIVE TO GOVERNMENTS

Insight: We identified four strategic “entry points” or incentives that appear to be capable of motivating governments to initiate or expand fisheries data modernization efforts:

1) Reframing sustainable fisheries management as a livelihoods, economic opportunity, or broader environmental sustainability issue to tap into domestic or international development support; 2) Meet the evolving demands of the trade and tourism sectors through robust information systems that can deliver timely analytics, 3) Leverage EM & ER initiatives to build out comprehensive data management systems, and 4) Utilize the technologies and capabilities developed for maritime security to advance fisheries data systems.

Opportunity: Funders can use strategic entry points as a way to direct resources to on-the-ground initiatives; practitioners can similarly evaluate which of these incentives might be available within their system and design around this potential point of leverage.

2: UTILIZE COUNTRY-LEVEL STRATEGY AND DESIGN

Insight: Technology-driven pilot projects and fisheries policy reforms have struggled to scale success. The following best practices could help address this gap by focusing design on a regional or national level from the start:

- Set a clear and holistic vision by defining the purpose and scale of modernization; why it's needed, and the vision for how it meets management, industry, and public needs;
- Provide Resources Beyond the Pilot via a funding plan that allocates resources beyond Stage 2, including support for embedding processes into daily operations; and
- Employ Human-Centered Design (HCD), acknowledging that no technology or policy is perfect, so good design needs to include strong incentives for good behavior.

Opportunity: Test the benefits of a strategy-driven and user-centered approach by executing projects with select governments. Future of Fish is interested in working with partners to launch initiatives that prioritize national data strategy and design in order to test the efficacy of this approach in different government contexts. An additional opportunity is to compare learnings from these projects to determine what worked well across all or some of the countries. These findings would help identify “universal” strategies for success, as well as new barriers that emerge under specific conditions.

3: BUILD A GLOBAL COMMUNITY OF PRACTICE WHILE GROWING IN-HOUSE TALENT

Insight: Embedded experts are critical to successful data modernization, providing a stable community of practice that can outlast political turnovers or temporary funding lapses. Unfortunately, most government agencies lack such capacity in-house. Building local expertise requires a broad variety of supportive services.

Opportunity: Future of Fish is interested to explore the use of intermediary services to support capacity development at scale. Other tools and initiatives such as mentorship learning exchanges, on-the-ground targeted training exercises, and the creation of a neutral 3rd party data hub could also help grow local talent to fill this gap. There is also an immediate demand to organize teams of global experts—those rare individuals with the experience and knowledge of IT, fish, policy, and management, who can help guide and drive conversations around data standards and protocols within and across governments, NGO, and industry sectors.

Our findings align with conclusions reached by several other studies and projects that explored aspects of data modernization in fisheries, especially the evolution of EM and ER systems. These resources, however, remain scattered and difficult to find. We have created a database of reports, tools, and guides that we would be happy to share upon request for those interested in tapping into the current state of knowledge on the subject.

We know effective solutions will require strong collaborations, and welcome both continuing input as well as partnerships to test and implement best practices on the ground.



Participants build their ideal data system during Future of Fish-facilitated fisheries data strategy and mapping workshop in Chile.

For access to the full report, to submit feedback, or for more information on collaboration opportunities, please contact Future of Fish Traceability Program Director, Fiona Lugo-Mulligan, at: fmulligan@futureoffish.org.