

Catalyzing the Growth of Electronic Monitoring in Fisheries: Executive Summary

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Background on Electronic Monitoring

Every day, millions of fishing vessels ply the oceans to harvest seafood that helps feed the world's almost 8 billion people. The enormous challenge of protecting the productivity of the oceans while also safeguarding the livelihoods of the millions of people who work along the seafood value chain through traditional tools of data collection can be expensive and imprecise. The result is annual losses of \$83 billion USD in global fisheries from insufficient management, accompanied by a gradual decline in the health of fish stocks and the marine environment.¹

Electronic Monitoring (EM) can provide the detailed information fishery managers need to solve their data and compliance challenges. EM uses an integrated system of on-board cameras and sensors that record fishing activity and extract data. This powerful tool can enable more targeted, cost-efficient management strategies and create opportunities for seafood industry stakeholders to drive improvements in their operations and demonstrate legality and sustainability to the seafood marketplace.²

The 2018 Report and 2020 Update

In 2018, The Nature Conservancy (TNC) and CEA Consulting (CEA) released the report, "Catalyzing the Growth of Electronic Monitoring in Fisheries." The report highlighted that, although growth of EM has historically been slow, it was at an inflection point and poised for more rapid growth. In 2020, CEA and TNC released a progress update report that revisits the original recommendations for growth, assesses the progress and new innovations that have been made, identifies key remaining barriers, and updates the investment blueprint based on what has changed or been learned over the last year and a half.



Onboard EM system, Rhode Island.
Photo: Ayla Fox / The Nature Conservancy

1. World Bank Group, "The Sunken Billions Revisited: Progress and Challenges in Global Marine Fisheries," 2017, <https://openknowledge.worldbank.org/bitstream/handle/10986/24056/9781464809194.pdf>

2. Philip Christiani et al., "Precision Fisheries: Navigating a Sea of Troubles with Advanced Analytics" (McKinsey & Company, 2019), <https://www.mckinsey.com/~media/McKinsey/Industries/Agriculture/Our%20Insights/Precision%20fisheries%20Navigating%20a%20sea%20of%20troubles%20with%20advanced%20analytics/Precision-fisheries-Navigating-a-sea-of-troubles-with-advanced-analytics-vF.ashx>

Progress Update

- **Since 2018, at least 16 new EM trials or programs have launched**, covering approximately 250 additional vessels. These new trials and programs are further demonstrating the capabilities of EM to fill critical fishery data gaps. However, the growth of EM is still slow relative to the monitoring needs in fisheries. The next few years may prove critical for scaling up the growth of EM.
- **New EM commitments** from industry (e.g., Thai Union), governments (e.g., New Zealand), and regional fisheries management organizations (RFMOs) have continued to emerge.
- **Market-based sustainability initiatives** (e.g., eco-certifications, fishery improvement projects (FIPs), traceability solutions) and import regulations have provided incentive for some fisheries to adopt EM. Examples are also emerging about EM supporting more efficient and flexible fisheries management.
- **Progress is being made on using EM to monitor both labor practices and transshipment activities**, including on-the-water testing of transshipment monitoring.
- **There have been great strides in artificial intelligence (AI) development**, including the development of Fishnet.AI, a library of 100,000 tagged EM images to support AI development. Simultaneously, innovations are showing how to achieve program objectives at lower cost, including research demonstrating that lower video review rates can still provide accurate data and drive compliance.
- **Performance-based standards, third-party contracting, industry-driven multi-provider program structures, and “EM as a Service”** are all being actively explored and are designed to reduce government capacity requirements, reduce transaction costs, maximize industry flexibility, create incentives for EM provider hardware and software improvement, and drive efficient program development and delivery. These models have promise but have yet to be widely tested.
- **EM service providers have developed lower cost EM systems targeted to smaller vessels**, but little progress has been made driving hardware cost reductions for systems on larger vessels
- **There is a growing ecosystem of conferences, bilateral exchanges, and working groups sharing and disseminating information on EM.** Of particular note are efforts to provide targeted support to regulators, such as the International Council for the Exploration of the Seas (ICES) Working Group on Technology Integration for Fishery-Dependent Data (WGTIFD) for the North Atlantic.

Remaining Barriers

- **Limited government demand.** Fishery management decisions require a thorough assessment of the costs, benefits, and risks of implementation. But regulators considering EM for the first time have a lot of uncertainty, which can bias them towards inaction. More specifically, governments may lack clarity about the scale of the current problem, whether EM will solve the problem, and at what cost.
- **Weak consumer demand for sustainable seafood.** Sustainable seafood demand has grown markedly in the last 15 years and has pushed the seafood industry to adopt better practices. But there are several barriers that constrain consumers’ ability to make responsible purchasing decisions, which has limited retailer and food service industry demands for EM in their supply chains. Eco-certifications and FIPs have nudged a handful of fisheries to pursue EM but have not been a strong driver for EM overall.
- **Immature EM market.** The market for EM is small, has grown slowly, and has yet to make the transition to a higher volume and more competitive stage of development. In this market context, individual EM providers have limited resources to invest in product innovation and activities, such as government outreach and developing data interoperability, that could lift the entire EM market.
- **Industry opposition.** In most cases, industry views EM primarily as a compliance mechanism that will constrain their fishing operations and cost them money and may have concerns about privacy, data management, and operational impacts on their business. Although industry opposition to EM tends to fade once they begin using the tool, it is a significant barrier to developing new programs.





Near-Term Recommendations for Advancing EM

The 2018 report put forward a series of near-term recommendations for advancing EM. The following is an updated set of priority near-term investments to catalyze the growth of EM. These updated recommendations reflect the progress and lessons learned since the release of the original report.

The recommendations are organized thematically in four main groups (Table 1): Markets, Policy, Technology, and On the Water

These updated recommendations aim to accelerate the growth of EM by building demand for EM, reducing the cost of EM, supporting regulators, and promoting industry leadership.

TABLE 1. Taxonomy of Updated Recommendations and their Primary Objectives

		 BUILD DEMAND	 REDUCE COSTS	 SUPPORT REGULATORS	 PROMOTE INDUSTRY LEADERSHIP
Markets	<i>Amplify pressure on retailers for on-the-water monitoring</i>	✓			
	<i>Strengthen data adequacy requirements of the MSC standard</i>	✓			
	<i>Ensure traceability efforts incorporate EM</i>	✓			
	<i>Secure commitments to 100 percent on-the-water monitored seafood products</i>	✓			✓
	<i>Support pre-competitive collaboration among EM providers</i>	✓	✓		
	<i>Coordinate buyers into bulk procurements</i>	✓	✓		✓
Policy	<i>Secure EM policy commitments with credible implementation plans across a range of fishery archetypes</i>	✓			
	<i>Test and validate lower video review rates and more efficient video review methods, including risk-based approaches</i>		✓		
	<i>Develop scalable performance-based standards</i>		✓	✓	
	<i>Promote “EM as a Service” contracts</i>		✓		
	<i>Advocate for more flexible or targeted management measures enabled by EM</i>	✓			✓
	<i>Build and support EM expert working groups</i>			✓	✓
Technology	<i>Support AI development to drive more efficient video review and analysis</i>		✓		
	<i>Develop on-vessel AI for “near real-time” data</i>	✓	✓		
On the Water	<i>Demonstrate EM across a range of fishery archetypes</i>	✓	✓	✓	
	<i>Demonstrate new use cases for EM (e.g., labor and transshipment)</i>	✓			