

This fact sheet is one in a series outlining key elements for regional fisheries management organizations to consider as they develop electronic monitoring programs. More information is available at pewtrusts.org/ElectronicMonitoring.



Data Review and Privacy

Managers must balance strong data standards with protections for crew, fishing industry

Overview

Managing data collected by thousands of vessels using electronic monitoring (EM) systems can be more complex for a regional fisheries management organization (RFMO) than for a national program. Through engagements with stakeholders, RFMOs must determine what data they should collect using EM systems to meet their program's objectives, how much of that data will be reviewed, and by whom. During this phase of developing an EM program, RFMOs should also consider stakeholder access to data and privacy concerns.

Video review method and standardization

Extracting data and reviewing video footage is a key element of an EM program—and potentially the costliest. The more footage is reviewed, and the more detailed the data, the more expensive the process will be. RFMOs should carefully balance the need to meet minimum data standards with not overburdening the program with additional costs. They should also consider which data fields are best collected by an electronic system and which by an observer. For example, EM may be able to identify the number of sharks a vessel hauls in as bycatch, but identifying each species may be more time-consuming. Artificial intelligence may eventually make the reviewing process more efficient, but these emerging technologies are not ready to be deployed yet. Table 1 outlines three video review approaches that should be considered.

Transmitted video could be standardized across the entire EM system to ensure that all the file formats are compatible for review by all the necessary reviewers' software. This will reduce the data "cleaning" that should occur once all the EM data is centralized and enable it to be efficiently reviewed, as necessary.

Table 1

Potential Approaches for Reviewing Video Footage

Review method	Primary data source	Advantages	Disadvantages
Census: Review of all, or a subsample of, fishing activity that is scaled up to create fishery-wide estimates (e.g., fishing effort, times, locations, and target and non-target catch data)	EM video data	<ul style="list-style-type: none"> High data quality 	<ul style="list-style-type: none"> Higher review time/cost May require specific catch handling practices
Logbook audit: Review of a random fishing activity sample, which is compared to vessel-reported logbook data	Logbook	<ul style="list-style-type: none"> Lower review time/cost Use of fisher-provided data Good-quality data 	<ul style="list-style-type: none"> May require specific catch-handling practices Can be used only for logbook-reported data
Compliance: Basic review of video for a non-compliance event	EM video data	<ul style="list-style-type: none"> Very low review costs No specific catch-handling procedures 	<ul style="list-style-type: none"> Limited to most basic functions (e.g., did a discard happen?)

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Additional Logbook Audit Considerations

Logbook audits are the most commonly used video review approach in most EM programs. Of the methods outlined in Table 1, this approach will also have the most significant impact on costs. The audit approach will dramatically reduce review expenses, but a less-appreciated benefit is that it also helps build industry buy-in to the program, since its self-reported data is used to inform management decisions.

Video reviewers

EM program structures will influence who will review video footage. Program designers have three options when deciding who will review it: national fisheries agencies, third parties, or RFMO staffs. (See Table 2.)

Table 2
Review Structures

Review model	Considerations
National fisheries agency review: Review completed by member governments	<ul style="list-style-type: none"> Members will need to build their own capacity Potential for complications of data ownership between member States, along with variability across national observers May raise privacy concerns from the fishing industry Cost barriers can exist due to start-up costs (e.g., hiring and training staff, purchasing review stations)
Third-party review: Third-party service contract (e.g., with a commercial EM vendor or quasi-governmental agency) to review footage and deliver processed data that meets specified standards	<ul style="list-style-type: none"> Government can act solely as a contract manager, rather than building internal capacity to review EM video from scratch If local jobs are a concern, contracts can require in-country reviews
RFMO staff review: Using RFMO staff to analyse EM video	<ul style="list-style-type: none"> Start-up costs (e.g., building a review centre) can be high, but having a centralized review centre may be more beneficial than setting up review centres in multiple member States Potential resistance may arise from member States that want to maintain control of the review process; States may be reluctant to share data taken from within their exclusive economic zones or on their flagged vessels

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Post-review access

Fisheries managers should also develop an EM data-access chart that details agreements on how to handle video footage and which entities can access raw footage and processed data. This system may be complicated for a national fisheries agency review structure when vessel trips span multiple countries' exclusive economic zones and the high seas. How data access is structured varies across EM programs, but there are many advantages if vessels have access to the video and data from their trips. This information can be valuable for industry (e.g., evaluating on-vessel operations and monitoring for safety) and is an important incentive for building industry support. Creating a map of EM data flow can help clarify who is responsible, who pays, and how data will be used.

Privacy

Privacy is among the top concerns that stakeholders have about EM systems. RFMOs must consider issues ranging from the crew's privacy to data confidentiality. Regardless of the concerns, data collection must remain the top priority if an EM program is to be effective.

“Cameras should primarily be focused on fish and fishing gear, not people.”

“Roadmap for Electronic Monitoring in RFMOs,” CEA Consulting (2020)

Privacy concerns should be addressed when RFMOs develop their objectives for EM programs. Creating an EM system should be transparent and participatory so that stakeholders agree on how EM data will be used to improve the fishery. In addition, RFMOs should put mechanisms in place to ensure that records are not shared with unapproved parties. Fishery managers should consider the following privacy components:

- **Workplace privacy.** These steps can ensure that cameras are trained on fish and fishing gear, not people:
 - During installation, give the crew a chance to view what the cameras are recording to help address any concerns.
 - Install sensors that trigger recording only when fishing activity occurs. Sensors have the added benefit of maximizing storage capacity.
- **Ex-vessel data confidentiality.** Beyond workplace privacy and general concerns about being monitored, industry members may be concerned about the possible misuse of confidential data. Data privacy standards used for observer programs and RFMO logbook catch data confidentiality arrangements can be a model for an EM program. One option would be to require an independent third party to review EM records under strict contractual obligations—for example, to analyse data only for specific purposes and delete raw images once they have been examined. Fisheries agencies or other stakeholders would receive raw imagery only if the third party observes a non-compliance event or other incident the RFMO agrees must be reviewed.

Conclusion

Comprehensive data and review standards are essential to ensure that an EM program collects and analyses the information necessary for the scientific and management processes, while still making sure that strong privacy protections remain for crews and vessel operators. Managers should seek out and incorporate input from vendors, fishers, and industry members when designing these elements to make certain that these requirements meet the program's objectives while also addressing stakeholder concerns.

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