

7th Meeting of the Scientific Committee (SC7)
21-25 March 2022 (online)

E-monitoring in some RFMOs

Relate to agenda item: 11.3

Working paper Info paper Restricted

SC Vice-Chair, Australia and Japan

Abstract

This information paper addresses Paragraph 43 of the intersessional workshop on the Harmonisation of Scientific Observers' Programme (WHSOP) Report were *"The SC Vice-Chair, Australia and Japan volunteered to work intersessionally to prepare an information paper summarising these processes (E-monitoring underway in other RFMOs) for submission to the 2022 SC meeting"*.

Recommendations

It is recommended that the SC:

1. Notes the outcomes on E-monitoring in other RFMOs and
 2. Agrees to present summaries of the development of CCPs electronic monitoring programs at the 2023 SC meeting as per Paragraph 44 of the WHSOP report
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INTRO

The intersessional workshop on the Harmonisation of Scientific Observers' Programme (WHSOP) took place on 27 October, 3 and 10 November 2021 and provided key recommendations on: how to harmonise the scientific observation programmes of the CCPs, the process for evaluating scientific observation programmes in order to improve data quality and on electronic monitoring system to support scientific observation.

The workshop [Report](#) noted that working processes are underway at other RFMOs, including the Commission for the Conservation of Antarctic Marine Living Resources, the Indian Ocean Tuna Commission, and the North East Atlantic Fisheries Commission. The SC Vice-Chair, Australia and Japan volunteered to work intersessionally to prepare an information paper summarising these processes for submission to the 2022 SC meeting.

E-MONITORING IN OTHER RFMOs

1. NEAFC - The North East Atlantic Fisheries Commission¹:

In October 2021, PECMAS (Permanent Committee on Management and Science) addressed the use of cameras/electronic monitoring and machine learning for scientific purposes in fisheries in the Working Paper [PECMAS 2021-01-08](#).

This Working Paper summarized the outcomes of the [FAO Workshop](#) (held virtually on 31 August 2021) on the "Use of still and video cameras to record deepwater shark and VME indicator catches by scientific observers". The workshop addressed innovations in using cameras onboard fishing vessels to assist observers in collecting more and better data.

PECMAS discussed its views on the future potential for cameras/electronic monitoring for scientific purposes within NEAFC.

In discussion, a Contracting Party noted that various projects were ongoing on this technology, but its view was that camera options were unlikely to replace observer work. Cost and other considerations could stand in the way of its application. It was also noted that NEAFC only had limited observer provisions under [Recommendation 19:2014](#)², and none related to compliance. ICES explained while it was interested in better data, a way to handle the large amounts of data potentially generated by such technology was also needed. ICES also tried to stay in the position of receiving scientific data without being involved in compliance.

¹ The North East Atlantic Fisheries Commission (NEAFC) is the Regional Fisheries Management Organisation (RFMO) for the North East Atlantic, one of the most abundant fishing areas in the world. The area covered by the NEAFC Convention stretches from the southern tip of Greenland, east to the Barents Sea, and south to Portugal.

² Protection of VMEs in NEAFC Regulatory Areas

PECMAS noted the information provided. While it was open to further discussions on the use of electronic monitoring, no specific proposals were being considered. PECMAS thanked the European Union for offering to send some information on the issue and would welcome any other information from Contracting Parties on ongoing or planned use of electronic monitoring for scientific purposes.

2. CCAMLR - The Commission for the Conservation of Antarctic Marine Living Resources³

CCAMLR's has been considering e-monitoring since 2016 through various scientific working groups and Standing Committee on Implementation and Compliance (SCIC). A summary of discussions that have occurred in CCAMLR on e-monitoring can be found in Annex A. In 2019 SCIC formed an electronic discussion group to progress developing standards for e-monitoring. Through this process the United Kingdom has proposed some technical standards and so far, there has been limited engagement by other delegations.

Currently e-monitoring systems are installed on Marine Stewardship Certified (MSC) longline boats fishing for toothfish in the Ross Sea fishery. The primary goal of these installations is for operators to verify their compliance with CCAMLR measures should reports of non-compliance be raised. Industry are required to keep footage for five years.

Australia has also installed e-monitoring systems on 4 of the 5 toothfish longline boats operating in the Heard Island and McDonald Islands Fishery within CCAMLR. Australia uses information from the systems to supplement information collection required by CCAMLR. It is anticipated that Australia will update CCAMLR what data it is possible to collect from these boats and how e-monitoring could be used as a data collection tool in CCAMLR.

3. IOTC - The Indian Ocean Tuna Commission⁴

Electronic Monitoring Systems is a proven technology to collect fishery information, including when external circumstances prevent at-sea human observers from being deployed onboard, and complement human observers to address the data requirements under [IOTC Resolution 11/04](#) on a Regional Observer Scheme. The IOTC Scientific

³ The Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) is an international treaty. The Convention Area is described in the Convention on the Conservation of Antarctic Marine Living Resources as consisting of all waters bounded by the Antarctic Continent to the south, and to the north by a line starting at 50°S 50°W; thence due east to 30°E longitude; thence due north to 45°S latitude; thence due east to 80°E longitude; thence due south to 55°S latitude; thence due east to 150°E longitude; thence due south to 60°S latitude; thence due east to 50°W longitude; thence due north to the starting point.

⁴ The Indian Ocean Tuna Commission (IOTC) is an intergovernmental organisation responsible for the management of tuna and tuna-like species in the Indian Ocean. The area of competence of the Commission shall be the Indian Ocean (defined for the purpose of this Agreement as being FAO statistical areas 51 and 57 and adjacent seas, north of the Antarctic Convergence, insofar as it is necessary to cover such seas for the purpose of conserving and managing stocks that migrate into or out of the Indian Ocean. The Commission, at its 4th Session in 1999 agreed to modify the western boundary of the IOTC area of competence from 30°E to 20°E, thus eliminating the gap between the areas covered by IOTC and ICCAT.

Committee in 2020 (SC23) noted that EMS is a very promising tool for enhancing observer coverage and complement data collected by onboard observers.

The SC23 also acknowledged the importance of including all different stakeholders in the discussions around Electronic Monitoring Standards (i.e., scientists, EMS designers/vendors, fishermen, representatives from the industry) to improve its current approach and contribute to EM Programme Standards by providing technical advice on the operational aspects of their implementation, and foster the developments of new tools such as Artificial Intelligence (AI) subsystems for the identification of the most effective data analysis strategies and to facilitate the analysis of the images.

Considering the steps taken for the definition and development of Electronic Monitoring Programme Standards, the SC23 also noted that these require additional contributions and development for their successful implementation at regional level. As such, the SC23 recommended that an ad-hoc, intersessional Working Group on the development of EM Programme Standards be constituted and physical or virtual workshops (depending on the circumstances) be held to further progress with the definition of EMS minimum standards as well as on the implementation of electronic monitoring projects by CPCs in support of the Regional Observer Scheme (ROS).

The Commission at its 25th meeting (June 2021) endorsed the recommendation of the Scientific Committee and created the ad-hoc working group on the Development of Electronic Monitoring Programme Standards (WGEMS). The IOTC Commission and Secretariat organized the first meeting in November 2021 to discuss the potential for electronic monitoring (EM) implementation for tuna fisheries in the IOTC and to develop a roadmap and next steps in progressing these initiatives.

ANNEX A - Recent discussions of e-monitoring at CCAMLR

2016: Working Group on Fish Stock Assessment (WG-FSA-2016)

Paper presented during this meeting detailed an EM trial for collection of catch and by-catch data, which showed positive results relating to (1) meaningful use of observer time, and (2) efficiency of haul catch counts of larger species using EM.

The WG noted that:

- Camera monitoring ‘may help reduce variability in proportions of target species to non-target species’.
- ‘Any progress towards a trial would require a ‘step-wise’ approach with regard to implementation’.

2018: Working Group on Statistics, Assessments and Modelling (WG-SAM-18)

A paper presented to the WG found that there were no significant differences between EM data collected on setting and hauling positions compared to observer collected data. This proved EM to be a reliable data collection tool during hauling, as well as on line setting and hauling activities.

The WG noted:

- That the EM system allowed the observer more time for biological and other sampling, notably because less time was spent on tasks such as line setting observations, determining species mix, or size compositions.
- The use of low-light and thermal cameras for detecting seabirds, as well as cost effectiveness of EM systems long term.
- That EM systems show ‘great promise to support observers in SISO duties’, and the WG encouraged other Members to explore the use of EM.
- That the use of EM systems would provide insights into the relative importance of vessel procedure and environmental effects on tagged fish survival and tagged fish detection.

2019: Working Group on Fish Stock Assessment (WG-FSA-2019)

Paper presented described developments of EM work in the Ross Sea toothfish fishery, broadly looking at the use of EM to improve research data collection and evaluating the importance of resolution and clarity relative to data requirements. The paper highlighted the ability for EM to support research tasks, by ‘automating tasks that do not require human effort’. For example, EM could be relied upon for recording deployment and operation of a tori line during line setting and other line observations, hence enabling observers to allocate more effort to other tasks.

WG comments:

- Encouragement for the use of EM systems, particularly due EM’s ability to help in assessments of VME taxa and estimation of organism loss during hauling.
- Group welcomed the development of electronic monitoring and agreed that these approaches would help improve the accuracy of data collection
- Noted that electronic monitoring data should not be viewed as a replacement for SISO observers but provides improved efficiency of vessel operations, including improved

approaches to the provision of catch reporting data required by CCAMLR. Information to improve understanding of vessel operations and practices that allow more comprehensive analyses enhanced interpretation of conventional data collection.

- Note of the ability of electronic monitoring to assist in managing observer workloads and task prioritisation

2019: Standing Committee on Implementation and Compliance (SCIC-2019)

Paper (CCAMLR-38-/BG/40) presented EM as a management tool to support research and compliance on CCAMLR vessels.

Committee comments:

- Considered EM as a promising tool to support research priorities and the monitoring of vessels.
- Noted improved reporting capacity and additional options for the collection and validation of data.
- Agreement to establish the e-group for intersessional discussions and work related to EM.

2020: 39th Scientific Committee (SC-CCAMLR-39)

A paper published in 2020 for presentation at the 39th SC was not discussed due to technical issues.

The findings of the study showed:

- That EM data recording all setting and hauling activities were similar to observer and logbook data.
- That EM data was successful at collecting data related to:
 - Time and location of each set
 - Use of seabird mitigation equipment
 - Identification and classification of seabird interactions, with a suggestion that this may allow future improvement of mitigation measures

The paper concluded that EM provides an important tool for assisting observers by:

- Reducing workload, specifically by removing routine line setting and hauling tally period tasks
- Allowing more time for tasks for which a human sampler is required, such as biological sampling or species identification