



Tracking Fishing Vessels Around the Globe

Vessel monitoring systems play a critical role

Overview

Vessel monitoring systems (VMS) are an essential tool for modern fisheries management. With proper implementation and appropriate sharing of data, these systems can also help detect, deter, and eliminate illegal fishing.

In the 1990s, fisheries managers began trials using satellites to track fishing vessel locations and movements.¹ In the years since, advances in technology have made these monitoring systems more sophisticated, though they

remain relatively easy to use. Today, regional management bodies, national enforcement agencies, and industry use VMS to keep a watch on vessel activity in most major fisheries around the world. These systems have become a key component in the fight against illegal, unreported, and unregulated (IUU) fishing.

To track movements at sea, a shipboard transponder transmits a vessel's identity and location (longitude and latitude), and often the course and speed,² via secure satellite communication and land earth station to relevant authorities—such as its flag state's fisheries monitoring center (FMC), as well as a ship's operators or owners. For vessels that stay close to shore, mobile phone technology is increasingly used to transmit the data to the FMC.

Only those authorized can access this information. Typically, that is government officials in relevant flag or coastal states. However, the vessel can also transmit its VMS data directly to or through the flag state or service provider; to other monitoring agencies, such as the secretariat of a regional fisheries management organization (RFMO); or another government. The information should be provided in real or near-real time to be most useful.

VMS can play an important role when tracking vessels fishing in areas beyond their home or flag states' national waters. When used effectively, these systems enable greater monitoring of fishing vessel activity in sensitive or closed areas, facilitate advance notification to authorities when vessels are approaching port or entering a state's exclusive economic zone (EEZ), and help detect when catch is being transferred from one ship to another at sea (transshipping).

Tracking enables greater analysis of vessel or fleet behavior by time and location, which helps authorities detect suspicious fleet patterns and aids monitoring, control, and surveillance efforts. VMS data also can support development of improved stock assessments. The information can be used by fisheries scientists to corroborate the accuracy of information from other fisheries management tools, such as vessel logbooks, catch records, and observer reports. Combining these capabilities with near-real time access by fisheries managers can eliminate the considerable delays associated with paper reporting methods. It also can greatly reduce the potential for false or intentionally manipulated and inaccurate data. Finally, efforts to trace the origin of fish may also benefit from near-real time VMS data. When that information is matched against fish landings, it can provide detail for the "chain of custody," and that helps track fisheries products from hook to plate.

VMS costs

The primary costs of a vessel monitoring system include the shipboard transponder, data transmissions, the user interface to view collected data, and the actual monitoring and analysis. However, increasing competition for VMS in the global market has brought down transmission costs. New technologies that allow data to be sent in "packets" have also helped make these systems less expensive.³ In addition, ongoing monitoring is now highly automated, which further reduces costs.

According to the United Nations Food and Agriculture Organization: "The major stumbling block facing effective global deployment of VMS is not technology or cost, it is mainly the will to deploy the systems and the imperative to reach global agreement on system standards and data sharing arrangements."⁴

Access to and sharing of VMS data

VMS transmissions are secure and governed by strict conditions on how government officials can use the information. Whenever information is shared with another government, additional confidentiality protocols typically must be followed. They include restrictions on network and software access, as well as requirements for data management and processing (including prevention of theft or loss) and communications security.

Most relevant authorities, including flag and coastal states and RFMOs, require the use of VMS on fishing vessels. Many flag states mandate that their own vessels carry VMS within national waters, on the high seas, and in the waters of other states. Some coastal states include VMS in licensing agreements that apply to foreign vessels registered to fish in their waters. Most RFMOs require the use of VMS by large vessels authorized to fish within their convention areas. However, in these cases, the RFMO member flag state has the authority, jurisdiction, and enforcement responsibility for mandating installation and operation of VMS and enforcing reporting obligations.

Increasingly, RFMOs and flag states are opting to share VMS data with one another and with coastal states. Some RFMOs have, or are developing, policies to allow for the direct and simultaneous transmission of data from the vessel to the organization's secretariat and the vessel's flag state FMC. Others require that data also be sent from the vessel to the secretariat and member coastal states. Centralizing the data in this way provides RFMO members with pertinent information that could be useful in authorized inspection actions, tracking vessels from port to port, and for scientific purposes.

RFMOs and vessel monitoring systems

Nearly every RFMO mandates the use of VMS, but requirements vary significantly. An analysis of the rules in 11 RFMOs⁵ indicates that policies in most could be improved to ensure more effective monitoring and transparency of fishing activities. The issues to be considered include:

- **Vessels covered.** Less than half of the RFMOs mandate VMS for vessels of all sizes; others limit coverage to those over a certain size, ranging between 15 and 24 meters.
- **Maritime area covered.** All of the RFMOs mandate VMS for vessels operating on the high seas; six also mandate its use within the EEZ of coastal member states.
- **Centralizing and sharing VMS data.** Seven RFMOs require flag states to provide VMS data to their secretariats, mostly via FMCs. Some are developing policies to allow for transmission to the secretariat in near-real time. Five require sharing of VMS data with concerned states for inspection or search-and-rescue purposes, and/or with RFMO scientific bodies.
- **Rules on VMS failures.** The RFMOs have weak rules on the transmission of data in the event of VMS failure.
- **Consequences of noncompliance.** The RFMOs have not established consequences for failure to comply with VMS obligations.

Key elements of effective VMS rules

Certain requirements must be in place for VMS to be capable of effectively monitoring compliance with fisheries management measures, both at a national level and in the framework of RFMOs:

- **VMS data should be sent to relevant coastal states and RFMOs.** Vessels should transmit VMS data simultaneously to the flag and coastal states, as well as appropriate RFMO secretariats, to ensure that accurate, near-real time data are available to the authorities who need it.
- **VMS should be required for all vessels.** Any vessel that is authorized to fish in areas beyond its national jurisdiction or in another state's EEZ should be equipped with VMS.
- **VMS units must be approved and tamper-proof.** Units must be of an approved type, sealed, fully automatic, and equipped with adequate backup and recovery capabilities. Authorities must test the units and the mobile communications service to ensure that they are in compliance with requirements and as close to tamper-proof as possible.

- **The VMS must be operational at all times with backup systems in place.** To provide the best data, units must be constantly in use. To account for possible system failures, rules should ensure that if vessels are unable to report within 24 hours—or upon notification by a competent authority—they must cease fishing, stow their gear, and head to the nearest port to repair the VMS. In all cases involving VMS failure, vessels should use manual reporting at intervals no more than every four hours as a temporary replacement.
- **VMS transmissions must be in near-real time.** Vessels should transmit VMS data at the highest possible frequency (ideally every one to four hours, depending on the fishing gear being used). A higher reporting rate permits more accurate monitoring of any fishing or transshipment operations and can help improve scientific stock assessments when correlated with catch data.
- **The VMS should provide for two-way reporting.** Communications between authorized entities and vessels enable the reporting agency to adjust the reporting rate and to request an immediate updated position when needed. It also allows real time communication with the vessel.
- **Viable penalties should be in place in case of noncompliance.** RFMOs and states must have mechanisms to control implementation of applicable VMS regulations and to apply strong penalties in cases of noncompliance. RFMOs should be able to mandate that vessels that do not comply be removed from the authorized vessel list. At the national level, those failing to comply should face prosecution, fines, or orders to return to port.

Conclusion

VMS is an essential tool for fisheries monitoring and management and increasingly for combating IUU fishing. With the adoption and implementation of effective rules and data-sharing among appropriate authorities, vessel monitoring systems can help to detect, deter, and eliminate illegal fishing in the world's oceans.

Endnotes

- 1 U.N. Food and Agriculture Organization, "FAO Technical Guidelines for Responsible Fisheries" No. 1, Supplement 1 (1998), <ftp://ftp.fao.org/docrep/fao/003/w9633e/w9633e00.pdf>.
- 2 More commonly, course and speed are not transmitted but calculated at the FMC, which provides for additional cost savings.
- 3 Navigis s.a.r.l., *Fishing Vessel Monitoring Systems: Past, Present and Future*, High Seas Task Force, Organization for Economic Co-Operation and Development (2005), 9, http://www.imcsnet.org/imcs/docs/fishing_vessel_monitoring_systems_past_present_future.pdf.
- 4 John M. Davis, "Monitoring Control Surveillance and Vessel Monitoring System Requirements to Combat IUU Fishing," U.N. Food and Agriculture Organization (2000), 70, <http://www.fao.org/docrep/005/y3274e/y3274e0g.htm>.
- 5 The 11 RMFOs are the Commission for the Conservation of Antarctic Marine Living Resources, Commission for the Conservation of Southern Bluefin Tuna, General Fisheries Commission for the Mediterranean, Inter-American Tropical Tuna Commission, International Commission for the Conservation of Atlantic Tunas, Indian Ocean Tuna Commission, Western and Central Pacific Fisheries Commission, North East Atlantic Fisheries Commission, Northwest Atlantic Fisheries Organization, South East Atlantic Fisheries Organization, and South Pacific Regional Fisheries Management Organization.

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