



**GENERAL FISHERIES COMMISSION FOR  
THE MEDITERRANEAN  
COMMISSION GÉNÉRALE DES PÊCHES  
POUR LA MÉDITERRANÉE**



**SCIENTIFIC ADVISORY COMMITTEE (SAC)**

**Report of the Workshop on the Implementation of a  
Vessel Monitoring System (VMS) in the Mediterranean and the Black Sea**

**Zagreb, Croatia, 28-30 November 2011**

**OPENING, ARRANGEMENT OF THE MEETING AND ADOPTION OF THE AGENDA**

1. The “Workshop on the Implementation of a Vessel Monitoring System (VMS) in the Mediterranean and the Black Sea” was held in Zagreb, Croatia, from 28<sup>th</sup> to 30<sup>th</sup> November 2011. The Workshop was attended by 33 experts from Albania, Algeria, Bulgaria, Croatia, France, Italy, Malta, Montenegro, Morocco, Romania, Spain, Tunisia and Turkey, including representatives of the European Commission (EU), the Community Control Fishery Agency (CFCA), the Junta de Andalucía and the GFCM Secretariat. The list of Participants is provided in Appendix B of this report.
2. Ms Nedica Skakelja, the representative of the host country, called the meeting to order and welcomed the participants, underlying the importance for Croatia to host this meeting, as a member of the GFCM for many years and given the significance of the GFCM role and mandate for its fisheries sector. In this context, she recalled the characteristics of Mediterranean fisheries and the subsequent necessity for efficient Monitoring Control and Surveillance (MCS) systems. She concluded referring to the GFCM as the right platform to work towards harmonized technologies and finally acknowledged with satisfaction the good level of attendance.
3. Mr Nicola Ferri, from the GFCM Secretariat, delivered an opening statement to recall the importance of the implementation of VMS in the GFCM area in order to ensure the conservation of marine living resources. He indicated that the outcomes of the workshop would be further elaborated and developed within the framework of the relevant upcoming meetings of GFCM.
4. Mr Robert Gallagher was unanimously selected as chair of the meeting. Mr Nicola Ferri and Ms Margherita Sessa, from the GFCM Secretariat, together with Ms Ivana Vukov, from Croatia, acted as Rapporteurs.
5. The Agenda was introduced and adopted (Appendix A).

## **BASIS AND CONTEXT OF VMS**

6. Mr Nicola Ferri informed the meeting about the role and the objectives of the GFCM regarding VMS. More precisely, he recalled that since the adoption of the “General Guidelines for a GFCM Control and Enforcement Scheme” in 2005 (annex H to the report of the 29<sup>th</sup> session of the Commission) the GFCM has intensified its consideration of the establishment of VMS. In this connection, Mr Ferri highlighted actions that were taken within the remit of the GFCM both before and after the adoption of Recommendation GFCM/33/2009/7 “Concerning minimum standards for the establishment of VMS in the GFCM area” (Rec. GFCM/33/2009/7). He then moved on to illustrate why the workshop had been convened, noting in particular its importance in order to help the GFCM in addressing current constraints faced by its Members in the implementation of VMS.

7. The floor was subsequently open in order to give GFCM Members the possibility of presenting an overview on national fishing fleets as well as on the current implementation of VMS in their respective countries.

8. Mr Arian Palluqi, from Albania, provided a snapshot on the Albanian fishing fleet, including figures on fishing vessels above 12m of length, which are all equipped with blue-box to enable transmission of VMS data. He underlined that VMS was put in place in November 2011. Therefore, the system is still in its testing phase at present. In the ensuing discussions it was pointed out how important it is to make sure that data collected through VMS in Albania can be used for compliance purposes, particularly if there is evidence that infractions might have occurred.

9. Mr Mohamed Bouzemada, from Algeria, recalled that his country is still in the process of putting in place VMS at national level. He reported that a company has been recently contracted for this purpose and it is hence envisaged to install an electronic system for localization of fishing vessels and analysis of their position and fishing activities before long. Algeria is also currently using the AIS system for the transmission of real time information and consider VMS as necessary to ensure the long term conservation of its fisheries.

10. Mr Konstantin Petrov, from Bulgaria, presented data related to the composition of the Bulgarian fishing fleet. He also explained what stocks are targeted and what techniques are used, stressing that Bulgaria complies with several EU regulations. He then reported on the development and implementation by the “National Agency of Fisheries and Aquaculture” (NAFA) of two information systems, namely Information Statistics System (ISS) and VMS, illustrating the distinctive features of both. Inter alia, these systems contribute to the enhancement of NAFA’s control techniques as well as to the effectiveness of the control activities and immediate data processing. With regard to VMS in particular, this system enables the communication between the Fishing Monitoring Center (FMC) and the master of the fishing vessel via the transfer of text messages. Mr Petrov concluded his presentation by providing basic information on the software currently used for data related purposes in Bulgaria. After the presentation, an exchange of views occurred and it was clarified by Mr Petrov that data collected is received by FMC and it is then conveyed to the officers responsible for MCS.

11. Ms Nedica Skakelja, from Croatia, cursorily described the Croatian fleet, including the gears used, catch related information, fishing grounds and fishing operations. As for the VMS, she recalled that Croatia has started the setting up of its VMS in 2006, in connection with bluefin tuna purse seines. The system has been subsequently upgraded and at present 2/3 of the Croatian fishing vessels above 15m are equipped with blue-box. She then mentioned that Croatia has also set up an FMC and that its country operates a dual-system VMS (devices capable of using both satellite and GSM signal, depending on the availability of the networks). This allows for a much higher frequency of data transmission as well as for a reduction in transmission costs. This dual-system is set as a web-based application, operating with required security parameters. Finally, Ms Skakelja reported that in 2010 Croatia has begun the installation of the e-logbook on its fishing vessels, beginning with the bluefin tuna fleet, and recalled that Croatia is also preparing for the installation of the Automatic Information System (AIS) in line with EU legal requirements.

12. Ms Luigia Caiazzo, from Italy, explained what activities the Italian Coast Guard performs for the “Ministry of Agriculture, food and forestry policy” in relation to the control of fishing operations. She reported to the workshop about the Italian VMS, from the architecture to the graphical interface, and also illustrated the activities of the FMC, including Vessel Detection System (VDS) activities, the framework of European Projects cross checking ship reporting systems (e.g. AIS, VMS) and satellite data (e.g. SAR and optical images). In this connection, she also introduced three ongoing projects, one being jointly carried out with the European Maritime Safety Agency (EMSA) in order to integrate AIS and VMS data and to visualize them on the SafeSeaNet graphical interface available to the FMCs involved in this project.

13. Mr Christopher Sciberras, from the Fisheries Control Directorate, Malta, focused on the Maltese legal framework relating to VMS, which is currently under implementation. In addition, he expounded that Malta’s VMS was established in 2005, to monitor the fishing activities of national and third country fishing vessels of 12m and upwards. The system consists of multiple features to aid the Maltese Fisheries Control Directorate in the enforcement of the EU Common Fisheries Policy. He finally reported that the system operates through a Microsoft database and uses an interface consisting of a web browser mapping tool.

14. Ms Neda Lakicevic, from Montenegro, informed the workshop that the basis for the establishment of a VMS in Montenegro was a law on marine fisheries and mariculture adopted in 2009 in partial conformity with applicable EU regulation. As a consequence, and through an EU project, there was a current strengthening of the capacity of the Fisheries Inspectorate to monitor and control marine fishing activities and enforce said law as well as related regulations. In accordance with this, one of the project’s expected results is that of establishing VMS for vessels above 12m, which will be achieved through the creation of custom designed software for VMS, the procurement of blue-box for distribution to licensed fishing vessel above 12m, the establishment of fully equipped FMC and the full integration of VMS with FIS (e.g. vessel registration, licenses and logbook system). She finally stressed the willingness of Montenegro to learn from both the discussions and outcomes of the workshop, with particular reference to the experience of other GFCM Members.

15. Mr Tarik Boufdili, from Morocco, recalled that VMS was launched in 1997 by the national Ministry of Fisheries in collaboration with military partners. Initially, the use of VMS was required for roughly 400 fishing vessels engaged in offshore fishing, then it was recently expanded to cover a major part of the coastal fishing vessels (1500 overall) in order to comply with the legislation issued in March and April 2010 as a supplement to the first national law relating to VMS (of 1999). The completion of the installation of VMS on fishing vessels is foreseen for the end of 2011. There are currently four FMCs operating and they follow the activities of the fishing fleet simultaneously. In addition, 15 maritime patrol units are equipped with mobile control centers.

16. Mr John Clayton Hermida, from Spain, described the various uses of VMS which in Spain is extremely important not only for compliance purposes but also for fisheries enforcement purposes, combating piracy, supporting rescue operations, inquiring the causes of maritime disasters and providing statistical data. Mr Clayton reported that VMS relies on two different satellite systems (e.g. INMASART-C, IRIDIUM) officially certified and subsidized by the government. It also gave a breakdown of the cost of both systems. In addition, he explained that the FMC performs various functions, ranging from security to confidentiality, encryption, data cross checking of the fleet register and information exchange schemes with other FMCs. Finally, he stressed that, in the near future, a combination of AIS, VDS with satellite radar images and electronic reporting systems (ERS) is needed to strengthen MCS.

17. Mr Naoufel Haddad, from Tunisia, briefly presented the country's fisheries sector and recalled its economic and social importance for Tunisia. He provided a detailed analysis of the typology of the national fleet units covered by Rec. GFCM/33/2009/7 and recounted that a considerable progress in the implementation of VMS has been made in Tunisia since 2003 through a pilot project, carried out aboard 20 fishing units, which facilitated the identification of various technical and logistical constraints. This allowed to choose the right technology solution for the implementation of VMS in Tunisia which is currently operational in relation to roughly 60 fishing vessels above 15m, corresponding to 6% of the national fishing fleet. He also informed the workshop that costs related to installation and communication will remain the most important obstacle for the implementation of VMS and emphasized the need for the establishment of a legal and institutional framework, which is currently being developed in accordance with Rec. GFCM/33/2009/7.

18. Mr. Murat Toplu, from Turkey, presented the country's fishing fleet, indicating that it consists of vessels operating both in the marine waters and in inland waters. He also clarified at the outset of his presentation that in Turkey there is neither a direct nor an indirect reference to VMS in the national body of law, though there is a draft law on VMS, prepared in line with relevant EU regulations. This draft is currently under consideration at national level for possible adoption. It is thought that AIS, which is obligatory for fishing vessels over 15m in Turkey, may help both to expand monitoring for fishing vessels over 12m as well as to reduce the costs of installment, communication and maintenance of VMS. These costs represent a major problem for the fishermen.

19. Mr Jari Leskinen, from the European Commission, presented the recently adopted EU regulation on control. This regulation will extend VMS usage to fishing vessels over 12m as of 1/1/2012. He underlined that there are however exemptions for fishing vessels between 12-15m if they operate only in territorial waters and never spend more than 24 hours on a fishing trip. He added that the use of e-logbooks has been made compulsory for fishing vessels over 15m since 1/7/2011 and from 1/1/2012 it will also be compulsory for fishing vessels over 12m (the same exemption mentioned above will apply though). He finally recalled that EU regulation on control also requires use of AIS for vessels over 15m by 31/5/2014.

## **VMS TECHNICAL DETAILS, SYSTEMS, IMPLEMENTATION**

20. Mr Gallagher, Chair of the workshop, explained the workshop was taking place in the context of the implementation of Rec. GFCM/33/2009/7 and that the goal expressed in this recommendation was that all GFCM Members should have an operational VMS by December 2012. He argued that the reason for the workshop was to advance towards this final goal. Mr Gallagher's initial presentation elaborated upon the fundamental issues that concern VMS, such as the necessary shipboard equipment, transmission media and the FMC to store and process received data. He evoked the issue of data security and then described the various strategies for optimizing the use of data gathered by VMS. Finally, he mentioned a number of future developments in vessel monitoring, such as the e-logbook and vessel detection systems. Mr Gallagher's final presentation of the session described VMS implementation, from the earliest planning through procurement, installation, training and beginning operations.

21. The role of public procurement in the context of the establishment of VMS was examined as a result of an exchange of views between the Chair and representatives in attendance. The Chair acknowledged that the issue of public procurement is a broad and complicated one as it is directly linked to the available resources for the setting up of VMS. With regard to investments on the software needed for information systems in particular, the difference was examined between the opportunity of using practical solutions (i.e. Google Earth) vis-à-vis a high level software. The Chair noted that all options are generally valuable and should not be discarded at face value. Furthermore, he indicated that depending on how active is the analysis and the use of data made by a State, the need for a more solid investment on softwares might be worth considering. Problems related to confidentiality were also singled out during the discussions that occurred after the presentation by the Chair. The main issue, when it comes to confidentiality, seemed to be whether or not confidentiality could block the use of data and, if affirmative, whether or not new policies for confidentiality should be envisaged. According to the Chair, the present proliferation in the quantity of data

and the speed of his movement were changing the very concept of data. As a result, he anticipated that confidentiality could be affected to the extent that secrecy (e.g. on fishing grounds) could be progressively done away with.

## **VMS OPERATIONS, USE AND SHARING OF DATA**

22. Mr José Navarro, from the Community Fisheries Control Agency (CFCA), presented the activities of CFCA, describing the different roles of the European Commission, Member States and the CFCA itself in relation to fisheries control and inspection activities. He also informed the workshop of the objectives, strategic axes of the agency and the ongoing joint deployment plans it carries out. In the context of the use of VMS in these plans, he explained that the CFCA receives VMS data from the FMCs of relevant EU Members and some RFMOs (ICCAT, NAFO and NEAFC) but never directly from the fishing vessels. This data is then relayed in real time to the authorities coordinating joint control operations in order to have an integrated knowledge of the position of all fishing vessels. Mr Navarro finally provided examples of the data flow in the control operation of the bluefin tuna campaign and of the use of VMS data for risk analysis in the North Sea cod joint deployment plan.

23. Mr Gallagher gave a description and operational scenarios of the use of VMS in support of MCS activities. He described the way that VMS data can be shared with those resources as well as with ancillary services such as fisheries resource management and even industry, including vessel operators. He stressed that cooperation between administration and industry was one of the principal means of defusing the adversarial attitude that can exist between industry and administration.

## **THE LEGAL CONTEXT OF VMS**

24. This issue was covered by Mr Gallagher and Mr Ferri. Their presentation addressed both the international framework supporting the use of VMS, including the 1982 United Nations Convention on the Law of the Sea, the 1995 United Nations Fish Stocks Agreement and the 1993 FAO Compliance Agreement. The national context including the two principal legal contexts, common and civil law, was also evoked. A number of legal issues were examined, such as the use of VMS data as evidence in prosecution of infractions, and in the establishment of standards of functionality for VMS equipment. In the end, a snapshot on the overall legal framework necessary for the implementation of VMS was provided.

## **EVOLUTIONS OF VMS AND RELATED SERVICES**

25. Mr Gallagher explained that a number of new data services were on the horizon and will enhance VMS. The most important of these is the e-logbook and he described the characteristics of this service as well as the level of implementation in the EU and in other countries around the world (Australia, Canada, the USA and Norway). He also explored the vessel detection system, the use of earth observation satellites to support compliance and control activities. An exchange of views took place after the presentation with the aim to understand what is necessary for electronic logbooks to operate. It was noted that whereas data was still collected in paper form, manual input would be replaced with an automatic connection when electronic logbook would be fully operational.

26. Mr Russo, researcher at the "Tor Vergata" University of Rome, informed the workshop about some scientific procedures and the related computational algorithms developed for the processing of VMS data, the spatial detection of fishing activity, the mapping of fishing pattern and the spatio-temporal analyses of fishing effort. Although the main thrust is that of tracking vessels down from fishing points obtained from VMS, these data are relevant also for ecological indicators and could represent a point of reference for the

GFCM in stock assessment. However, it was pointed out that a standard common method for the GFCM to produce indicators on fishing effort in particular could be needed.

## **THE ROLE OF VMS IN ARTISANAL FISHERIES**

27. An explanation of some of the difficulties facing the use of VMS in artisanal fisheries was offered by Mr Gallagher. These concerned principally the power supplies of the vessels as well as issues like available space and extreme conditions. To illustrate these issues he gave a detailed description of a VMS pilot project in the Seychelles, and how the VMS problem was solved using a combination of rechargeable batteries, data logging and downloading at ports. He suggested that some of the techniques involved could be used in larger scale fisheries as well to increase data density without increasing costs. Views were expressed that human resources, in addition to financial resources, would be needed in order for VMS to play a role in artisanal fisheries of the GFCM Area.

28. Mr Juan José Garcia Rodriguez, from the Junta de Andalucía, explained that the Location and Track System for Andalusian Fishing Vessels (SLSEPA) had been created in order to achieve three basic objectives, namely (i) evaluation and monitoring of the fishery resources, (ii) monitoring compliance within legal provisions and (iii) safety of life at sea. He also pointed out that this system could have great potential, particularly if operated by the artisanal fleet. In concluding, he highlighted the three features of SLSEPA - namely integrity (guarantee of reliability), confidentiality (data protection) and availability (using data in a timely manner) - that favor its use to collect evidence against IUU fishing by implementing an Information Security Management System in accordance with ISO/IEC 27001:2005 (UKAS certificate).

29. Mr Gildas Le Corre, from IFREMER, noted that for artisanal fisheries it is necessary to envisage a mechanism which enables to detect the position of fishing vessels in a consistent manner though costs have to take into account the specificities of these fisheries. He then presented RECOPECA, a pilot project for geolocalisation, which currently involves 30 fishing vessels between 5 and 12 meters operating in the Mediterranean Sea. Mr Le Corre, after having described this project, clarified that the system employed to the abovementioned vessels can be applied to small fishing vessels which are not equipped with VMS or, in alternative, on those equipped with VMS in order to obtain data on their position more frequently. This would be beneficial to perform certain data analysis relating to fishing effort.

## **THE WAY FORWARD: A HOMOGENIZED SYSTEM FOR GFCM AREA**

30. During the open discussions the workshop delved into constraints to the implementation of Rec. GFCM/33/2009/7. Also, consideration was given to priority areas that would require to be addressed to contribute to reach an even implementation of VMS in the GFCM area for the system to be as homogenized as possible.

31. The view was expressed by the workshop that the implementation of Rec. GFCM/33/2009/7 was not problematic per se but rather in the broader context of requirements needed to operationalize VMS. In particular, it was noted that the number of commitments required to States in connection with VMS, including but not limited to the analysis and the collection of data, were increasing. The workshop therefore pointed to the need to ensure that implementation of VMS would not become problematic in the future, that is when the GFCM would follow up on its recommendation on the subject. In this respect, it was noted by the workshop that the minimum standards currently covered by the recommendation should be supplemented with additional standards which relates to issues other than compliance (e.g. confidentiality, information exchange, cartography, etc.).

32. With regard to priority areas that would require to be addressed to contribute to reach an even implementation of VMS in the GFCM area, the workshop inter alia identified technical assistance, including in relation to artisanal fishing vessels, as appropriate, more precise legal frameworks, alternatives to satellite systems, reduction of costs associated with VMS, specification of sources of financial support to help States in the establishment and implementation of VMS while avoiding potential additional burdens on fishermen and improved data collection and analysis.

## **CONCLUSIONS AND RECOMMENDATIONS**

33. The following general conclusions were drawn from the workshop:

- Recommendation GFCM/33/2009/7 “Concerning minimum standards for the establishment of a Vessel Monitoring System (VMS) system” is being implemented without major difficulties. Nonetheless, a future problem could well be provoked by the integration of new technologies, the need for increased technical resources and new commitments involving the implementation of VMS under existing international, regional and national frameworks.
- The development of VMS implies further economic resources; it is essential however to take into consideration potential repercussions relating to costs of VMS (e.g. on fishermen, on national administrations, etc.) as a methodology for distributing the resources (e.g. regional projects, joint initiatives, etc.) where it is most in need.
- An information system would permit the distribution of data at regional level in order to foster common methods for the GFCM Area. Such an initiative may well require the involvement of GFCM as the central point for this distribution; this would assist GFCM Members, through sharing their experiences regarding VMS, to better organize their FMCs, including understanding how data gathered can be used for compliance purposes
- Considerable research will be required to assess the need of formulating a strategy and appropriate technical choices to bring VMS technology to the Mediterranean and the Black Sea artisanal fisheries.

34. The workshop agreed on the following recommendations:

- Existing legal frameworks regarding VMS need to be taken into account in order to specify a number of requirements that are instrumental to the sound implementation of VMS. GFCM Members could benefit from stewardship of GFCM, including in the elaboration of national laws and regulations.
- Given the evolution of VMS and inclusion of new technologies (e.g. vessel detection system, consistent with available resources at national level), additional minimum standards that would complete those relating to compliance in Recommendation GFCM/33/2009/7 “Concerning minimum standards for the establishment of a Vessel Monitoring System (VMS) system” should be elaborated. These standards might address issues such as, inter alia, confidentiality, cartography, data collection and data protection, data users and analysis, communication systems (particularly non satellite systems).

## **OTHER MATTERS**

35. The participants unanimously thanked the hosting country (Croatia) for the excellent organization of the workshop. The participants also thanked the Chair and the Rapporteurs for their work.

## **ADOPTION OF THE REPORT/RECOMMENDATIONS**

36. The meeting formally adopted the report along with its Conclusions and Recommendations on Wednesday 30<sup>th</sup> of November 2011.





## Agenda

### 1. Opening and arrangement of the meeting

- Welcome address
- Adoption of the Agenda
- Election of Chair, Session Chairs and Rapporteurs

### 2. Basis and context of VMS

- The role and objectives of GFCM regarding VMS (*GFCM Secretariat*)
- VMS in the countries of the GFCM competence area (Mediterranean and the Black Sea): overview of national fishing fleets of member countries as well as current implementation of VMS (*Representatives of Member Countries*)
- VMS overview: the technology and its objectives; adoption of VMS around the world, a look at future development of the system (*Robert Gallagher*).

### 3. VMS technical details, systems, implementation

- Satellite systems and shipboard equipment suited to VMS
- The Fisheries Monitoring Centre (FMC), design and functionality
- Procurement details of a VMS system
- The question of data tampering and security to prevent it
- VMS implementation: constraints and impediments

### 4. VMS operations, use and sharing of data

- Day-to-day responsibilities of an FMC operator
- Manual and automatic functionality
- Detecting questionable activity
- Interface between VMS and Monitoring, Control and Surveillance (MCS)

### 5. The legal context of VMS

- National law of fisheries regulation?
- VMS as a weapon against IUU fishing
- Role of VMS in terms of flag state, coastal state and port state responsibilities

### 6. Evolution of VMS and related services

- Extending data sets: the Electronic Logbook
- The use of satellite imagery for data verification
- Data services in the commercial context
- Imagining the fully integrated fisheries environment.

### 7. The role of VMS in artisanal fisheries

- The objectives of artisanal VMS
- Requirements of shipboard equipment
- Satellite or terrestrial communications?
- Benefits for fisheries managers and vessel operators

### 8. The way forward: a homogenized system for GFCM area

- Global objectives for GFCM VMS
- Responsibilities of individual states
- Shared responsibilities of member states
- Roadmap for system implementation

### 9. General conclusions/Recommendations

### 10. Any other matters

### 11. Adoption of the Report and closure of the meeting

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