



**FIRMS Steering Committee Meeting**

**Eleventh Session**

**Rome, Italy 13–14 and 18 May 2019**

**REPORT**

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Steering Committee members**

**EXECUTIVE SUMMARY**

The Fisheries and Resources Monitoring System (FIRMS) is a partnership of regional and international organizations, which provides access to a wide range of high-quality information on the global status and trend on fisheries and resources. The eleventh Session of the FIRMS Steering Committee (FSC11) convened in Rome, Italy, 13–14 and 18 May 2019. Fourteen partners participated in the Session (eleven members and three associated members), including two new partners: the Fishery Committee for the West Central Gulf of Guinea (FCWC) and the South Pacific Regional Fisheries Organizations (SPRFMO). A signature ceremony for these two new partners took place during the morning session of the first day of the meeting with Mr Arni Mathiesen, Fisheries and Aquaculture Department Assistant Director-General, signing on behalf of FAO.

The FSC11 agenda focused on expanding monitoring coverage and usage of FIRMS as authoritative source of information. The increase in Intergovernmental Organizations (IGO) membership brings FIRMS to sixteen IGO partners representing twenty-one regional fishery bodies (RFBs). Along the objective of expanding the FIRMS partnership and its coverage, a new legal instrument was adopted permitting new organizations, called “Collaborative Institutions”, to join the FIRMS Partnership as content and service providers as well as in the capacity of an advisory role in FIRMS meetings. Four institutions were invited to FSC11 to present their collaborative arrangement (i.e., Sustainable Fisheries Partnership (SFP), University of Washington (UW) RAM program, Marine Stewardship Council (MSC) and FORTH.

FSC11 endorsed a Governance model enabling the FIRMS Partnership to lead the further development of: i) the **Global Record of Stocks and Fisheries (GRSF)**, with participation of three collaborative institutions (UW/RAM, SFP, and FORTH); and ii) the **Global Atlas of Tuna and tuna-like species (Tuna Atlas)** with participation of one collaborative institution (Institut de recherche pour le développement – IRD). The proposed business model relies on partners’ in-kind contributions. FIRMS partners acknowledged that GRSF and FIRMS Tuna Atlas both entailed higher individual and collegial commitments, however confirmed these commitments to contribute in light of the value proposition and alignment with their agendas.

GRSF is a comprehensive and transparent inventory of stocks and fisheries records across multiple data providers, based on a standard for unique identifiers. By providing the evidence-base and transparency to support global or regional statements on stocks status, the GRSF aims to be a digital companion of SOFIA's stocks status and its evolution as the United Nations Sustainable Development Goals (SDG) Indicator 14.4.1 "Proportion of fish stocks within biologically sustainable levels". With the unique identifiers, GRSF also provides a tool for traceability and ecolabelling schemes with the aim to connect seafood industries and consumers to the status of stocks and fisheries. Overall, GRSF bears the unique prospect to bridge the connection between stock status, catch data, and trade information.

The Tuna Atlas is an interactive web-based mapping tool utilizing a global database for tuna and tuna-like fisheries data including total nominal catch, georeferenced catch and effort by 5°squares and for purse seiners and pole-and-liners by 1 squares, and catch at size, accessible online through a dedicated web portal, along with the set of open source codes (a « toolbox ») to handle the data.

The expanded FIRMS governance model includes a revised Governance diagram, the Collaborative Arrangement, and the revision of the Rules of Procedures. The Partners' roles were also further concretized for the necessary validation of GRSF records, and for handling technical and statistical aspects of the Tuna Atlas, including consideration of options for future inclusion of other species (e.g., billfishes, sharks). FSC11 also reviewed FIRMS' role in contributing to the sustainable development of world fisheries as required by the UN SDG, and in particular the provision of data services for monitoring national stocks reported by countries under SDG 14.4.1.

In line with the above, and following the recommendations of the Technical Working Groups, FSC11 endorsed as FIRMS information standards several concepts and definitions regarding typologies of stocks, aligned with SDG 14.4.1.

FSC11 conducted the normal progress review on performance during the intersession, including new and updated Partners data contributions, and the FIRMS Secretariat work in providing support to Partners for disseminating stock and fisheries status and trends. To date, the FIRMS database of marine resources and fisheries holds inventories on approximately 1 470 marine resources and 730 fisheries worldwide, which are reported in about 800 marine resources and 250 fisheries fact sheets published on the FIRMS website as primary observations in addition to the 700 historical records. FSC11 also endorsed as FIRMS information standards several definitions regarding typologies of stocks, which were prepared by the Technical Working Group.

Finally, a workplan was elaborated with the objective to continue providing the required support and capacity building to FIRMS Partners, and to release GRSF and the FIRMS Tuna Atlas in a good timing in respect of the Fishery Symposium.

## ABBREVIATIONS AND ACRONYMS

ASFIS	List of Species for Fishery Statistics Purposes
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CECAF	Fishery Committee for the Eastern Central Atlantic
CLME+	Caribbean and North Brazil Shelf Large Marine Ecosystems
CNR	Consiglio Nazionale delle Ricerche
COFI	FAO Committee on Fisheries
CPPS	Permanent Commission for the South Pacific
CTMFM	Joint Technical Commission of the Maritime Front
CWP	Coordinating Working Party on Fishery Statistics
EMODNet	European Marine Observation and Data Network
EOSC	European Open Science Cloud
ERCIM	European Research Consortium for Informatics and Mathematics
FAO	Food and Agriculture Organization of the United Nations
FCWC	Fishery Committee for the West Central Gulf of Guinea
FIA	Fisheries and Aquaculture Policy and Resources Division
FIRMS	Fisheries and Resources Monitoring System
FNS	Food and Nutritional Security
FORTH	Foundation for Research and Technology - Hellas
FSC	FIRMS Steering Committee
GFCM	General Fisheries Commission for the Mediterranean
GRSF	Global Record of Stocks and Fisheries
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
ICT	Information and Communications Technology
Ifremer	Institut français de recherche pour l'exploitation de la mer
INGO	International non-governmental organizations
IOTC	Indian Ocean Tuna Commission
IRD	Innovation Research Development
MSC	Marine Stewardship Council

MoU	Memorandum of Understanding
NAFO	Northwest Atlantic Fisheries Organization
NAMMCO	North Atlantic Marine Mammal Commission
NASCO	North Atlantic Salmon Conservation Organization
NEAFC	North East Atlantic Fisheries Commission
NGO	Non-governmental organizations
NPFC	North Pacific Fisheries Commission
OSPESCA	Central America Fisheries and Aquaculture Organization
PSC	Pacific Salmon Commission
RECOFI	Regional Commission for Fisheries
RFB	Regional Fishery Body
RFMO	Regional Fishery Management Organizations
RSN	Regional Fishery Body Secretariats' Network
SDG	Sustainable Development Goal
SEAFDEC	Southeast Asian Fisheries Development Center
SEAFO	South East Atlantic Fisheries Organizations
SFP	Sustainable Fisheries Partnership
SIOFA	South Indian Ocean Fisheries Agreement
SLA	Service Level Agreement
SPF	South Pacific Forum
SPRFMO	South Pacific Regional Fisheries Organizations
SWIOFC	Southwest Indian Ocean Fisheries Commission
TWG	Technical Working Group
UNCLOS	United Nations Convention on the Law of the Sea
UUID	Universally Unique IDentifier
UW	University of Washington
WCPFC	Western and Central Pacific Fisheries Commission
WECAFC	Western Central Atlantic Fishery Commission
WoRMS	World Register of Marine Species
VRE	Virtual Research Environment

## **1. OPENING OF THE SESSION AND WELCOME (AGENDA ITEM 1)**

1. The eleventh Session of the Fisheries and Resources Monitoring System (FIRMS) Steering Committee (FSC11) was held at FAO Headquarters in Rome, Italy, 13–14 and 18 May 2019, and was chaired by Ms Nancie Cummings (WECAFC).

2. The meeting was opened by Ms Vera Agostini (Deputy Director FIA division, FAO). Ms Agostini praised FIRMS' service to the world fisheries, which has greatly enhanced the availability of fishery information and provides transparency of fishery management decisions. FIRMS has contributed to the sustainable development of world fisheries and to the United Nations Sustainable Development Goals, especially SDG 14. The role of the FSC is to guide FIRMS' work and provide future directions. As a monitoring system collating and disseminating to world users authoritative information on the status of stocks and fisheries, the work of FIRMS is of great interest to the themes of the FAO international symposium on fisheries sustainability, which will be held in November 2019. FAO's vision of FIRMS is that of a provider of an authoritative, evidence-based digital resource, which supports global or regional statements on the status of stocks, providing the required transparency to world users as well as integration of SDG 14.4.1 national reporting. FIRMS' development of unique identifiers of stocks and fisheries provides another unique element, which will connect information on stock status, catch data and trade information. Ms Agostini's opening speech is presented in Annex 3.

3. Mr Marc Taconet (FIRMS Secretary) thanked Ms Agostini and welcomed FIRMS partners.

4. Mr Taconet recalled the history of FIRMS, starting from 2004 where the first decade of work focused on developing the operational system. In 2015, the focus shifted towards developing FIRMS into an authoritative resource, to be widely referenced and used. This aim required expanding the geographic coverage and improving the timeliness of data submissions, connecting FIRMS with other major global initiatives and publications such as the SOFIA Stock status indicator, SDG 14.4.1 and traceability, as well as responding to regional needs. These developments necessitated the expansion of the Partnership with additional RFBs sharing similar objectives, and the implementation of new FIRMS capacities.

5. In 2015, FSC9 was introduced to the BlueBRIDGE project proposal for a Global Record of Stocks and Fisheries (GRSF). During the development of that project in 2016 and 2017, two Technical Working Groups (TWG) involved some of the FIRMS Partners. The progress on GRSF was presented at FSC10 in 2017, and FSC10 requested the FIRMS Secretariat to work towards a fully-fledged proposal for FIRMS to govern the GRSF process. FSC10 also requested that the Secretariat reach out and invite new RFBs to join the FIRMS Partnership.

6. The Secretariat acted on FSC10 decisions for the expansion of the FIRMS Partnership, including convening two TWG meetings in 2018, and reaching out at the Seventh Session of the Regional Secretariats Network (RSN7) meeting during COFI in 2018. This outreach benefited greatly from the support of RSN7 Members and its Chair in promoting FIRMS.

7. Mr Taconet acknowledged with great pleasure the commitment of FIRMS Partners, with 14 of the 21 Partners (including 2 new Partners) present at FSC11. FSC11 also welcomed the presence of four institutions, which have expressed interest in joining the Partnership as Collaborative Institutions. Mr Taconet also noted the support provided by the FIRMS Secretariat and he thanked colleagues for their hard work.

8. Mr Taconet outlined the work planned for FSC11, which will consider how to leverage IT innovations for increasing collaboration towards the achievements of global and regional policy objectives. FSC11 will also discuss how this collaboration can be developed, what is the role of Partners individually and collectively, and how each Partner may contribute. The focus of this meeting is on expanding FIRMS through increased membership and development of the GRSF and Tuna Atlas.

9. Ms Cummings, Chairperson, thanked FAO for hosting FSC11, the FIRMS Secretariat for organizing the meeting, and the partners, Observers and other organizations for their ongoing contributions and commitment.

10. Nineteen Partners and other organizations participated in FSC11:

- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR, Partner)
- Food and Agriculture Organization of the United Nations (FAO, Partner)
- General Fisheries Commission for the Mediterranean (GFCM, Partner)
- International Commission for the Conservation of Atlantic Tunas (ICCAT, Partner)
- International Council for the Exploration of the Sea (ICES, Partner)
- Indian Ocean Tuna Commission (IOTC, Partner)
- Northwest Atlantic Fisheries Organization (NAFO, Partner)
- North-East Atlantic Fisheries Commission (NEAFC, Partner)
- Southeast Asia Fisheries Development Centre (SEAFDEC, Partner)
- South Pacific Regional Fisheries Management Organizations (SPRFMO, new Partner)
- Fishery Committee for the West Central Gulf of Guinea (FCWC, new Partner)
- Fishery Committee for the Eastern Central Atlantic (CECAF, invited by FAO)
- Marine Stewardship Council (MSC, invited as observer in the meeting)
- Southwest Indian Ocean Fisheries Commission (SWIOFC, invited by FAO)
- Western Central Atlantic Fishery Commission (WECAFC, invited by FAO)
- Sustainable Fisheries Partnership (SFP, collaborative institution)
- Institut de Recherche pour le Développement (IRD, collaborative institution)
- University of Washington (UW, collaborative institution, remote participation)
- Foundation for Research and Technology (FORTH, collaborative institution, remote participation).

## **2. ADOPTION OF THE AGENDA (AGENDA ITEM 2)**

11. The agenda was introduced (FSC11/2019/1) and it was conveyed that FSC11 would focus on the expansion of FIRMS through new partnerships (SPRFMO, FCWC) and additionally, a review of the proposed governance leadership of GRSF and the Tuna Atlas. The agenda was adopted without change (Annex 1).

### **3. FIRMS MEMBERSHIP (AGENDA ITEM 3)**

#### ***New FIRMS partners (Agenda item 3a)***

12. FSC11 welcomed two new FIRMS partners who became full partners in 2019: SPRFMO and FCWC.

13. Mr Craig Loveridge (SPRFMO) introduced SPRFMO to FSC11 and presented background on the overall context of SPRFMOs work (Annex 5). SPRFMO manages the high seas non-tuna fisheries in the South Pacific Ocean, covering an area of about 20 percent of the world's high seas areas. Currently, the main commercial resources fished in the SPRFMO area include jack mackerel and jumbo flying squid in the Southeast Pacific and orange roughy and other deep-sea species in the Southwest Pacific. In addition, there are exploratory potting and toothfish fisheries. SPRFMO further aims to ensure there is controlled dissemination of high quality and updated information for its fisheries and resources. This aim is shared by FIRMS and indeed the FIRMS arrangement promotes the development and extension of fisheries status and trends reporting amongst all fisheries resources.

14. Mr Séraphin Nadjé Dedi (FCWC) introduced FCWC to FSC11 (Annex 4). FCWC was established in 2007 to facilitate cooperation in fisheries management between its member countries: Liberia, Côte d'Ivoire, Ghana, Togo, Benin, and Nigeria. The countries have several shared fish stocks (including: sardinella, bonga, anchovy, horse mackerel, and other carangids) and identified a need for cooperation and guidance in the management of these resources. However, the absence of reliable fisheries data/information is hindering governments' ability to effectively plan interventions for the sector. This is further hampering the determination of appropriate exploitation strategies and long-term sustainable management of fisheries with the overall consequence of declining fisheries resources, degradation of fisheries-based livelihoods, increasing poverty and a general decline in the contribution of the sector to overall country GDP growth. The lack of reliable fisheries statistical data and information is an obstacle for effective decision making on marketing, investment and the sustainable management and exploitation of fisheries resources. As a partner in FIRMS, FCWC hopes to promote the development of standards for the collection, exchange, and reporting of fisheries data and coordinate Member countries' submission of fishery information. National inventories of fisheries including relevant fishing activities, production systems, and fisheries management will be structured for uploading to FIRMS.

15. The new partnership arrangements with SPRFMO and FCWC were signed by their respective representatives and Mr Árni Mathiesen (Assistant Director-General FAO) on behalf of FIRMS, during a signing ceremony on the first day of FSC11 (refer to paragraph 149).

16. Mr Mathiesen reflected on the important work of Regional Fisheries Bodies (RFB) in managing world fisheries and supporting UNCLOS and the UN Fish Stock Agreement. This work cannot be understated in the provision of essential and reliable information for the sustainable management of fisheries. Mr Mathiesen recalled that FAO was founded to collect and provide such information and this is still a core activity of FAO today.

17. FSC11 noted that the FIRMS partnership now includes 21 RFBs and institutions.

### **Prospective new FIRMS Partners (Agenda item 3a)**

18. Ms Paula Anton (FAO) reported on recent efforts to attract new partners to FIRMS (Doc. FIRMS FSC11/2019/2). Following the FSC8, FSC9 and FSC10 recommendation on increasing the number of partners, FIRMS Secretariat dedicated significant effort during this inter-sessional period on promotional and outreach activities. Since FSC10, FIRMS Secretariat attended 17 regional and global events. Among them, the RSN7 meeting organized during COFI33 was key as RSN7 Chairperson emphasized the importance of strengthening the collaboration between RSN members and FIRMS. A recommendation from FSC10 led the FIRMS Secretariat to approach 9 RFBs to invite them to join the FIRMS partnership during this inter-sessional period.

- CPPS was first contacted during the 7th SPRFMO Annual Meeting and has been next approached by email.
- NAMMCO was first contacted during RSN7, subsequent follow-up discussions have been organized with them and FIRMS Partners have been queried about the possibility of NAMMCO joining the partnership.
- WCPFC/SPC was briefed during the Technical Workshop on Global Harmonization of Tuna Fisheries Statistics (March 2018). Case studies and discussions on possible web services to automate submissions from their annual excel sheets were carried out afterwards.
- NPFC and SIOFA were first contacted during RSN7 and the proposal of joining the partnership has been approved by the Scientific Committees of both bodies.
- CTMFM legal department is reviewing the FIRMS Partnership Arrangement before submitting an official request to join the partnership.
- FCWC and SPRFMO completed the Partnership Arrangements during the inter-sessional period and officially joined the partnership at FSC11.

19. In response to a query from Mr Darius Campbell (NEAFC), Mr Taconet recalled that Partners were requested to review any potential overlap of information that may be provided by prospective new partners and/or conflicting views. This review is a requirement of the Partnership Arrangement.

20. FSC11 encouraged Partners to identify gaps in the coverage of information in FIRMS, and consider how new Partners, such as SPRFMO and FCWC, may fill such gaps.

21. Ms Anton outlined that the awareness and discussions with potential new partners have been instrumental to propel the FIRMS Secretariat to re-evaluate the potential benefits and opportunities FIRMS is offering to its users, Partners and the world. A summary of the potential benefits and opportunities FIRMS can offer at national, regional and global level was introduced, and Partners were encouraged to consider how benefits derived from joining FIRMS (e.g. dissemination of information beyond the own RFB context) may be used in outreach to prospective new partners. FSC participants were asked: "*What can FIRMS do for you, your institution, your member countries and your region?*" and they were requested to have this in mind during the two days' discussions and to inform the meeting of their thoughts at the end of the meeting.

22. The outcome of this discussion is reported under Agenda item 11 (paragraph 138).



### ***Collaborative Arrangement for FIRMS “Collaborative institutions” (Agenda item 3b)***

23. Ms Anton reported on the development of the new Collaborative Arrangement for FIRMS Collaborative Institutions (FSC11/2019/4). Since RSN6 and FSC9, as proposed by observers and potential new partners, the possibility of adding a new category in the FIRMS Partnership, with fewer responsibilities, particularly related to resource availability for attending the Steering Committee Meeting in person, hence also less rights, has been discussed. This possibility became a timely need with the emergence of the GRSF and the Tuna Atlas in the FIRMS landscape. Aiming to avoid amending the FIRMS Partnership Arrangement (PA) and with the “Collaborative Institution” existing already in the PA Annex 2, a Collaborative Arrangement has been developed to provide a new category in FIRMS Partnership.

24. The draft Collaborative Arrangement underwent a comprehensive cycle of reviews, feedbacks and adjustment between the FAO Legal Department, FIRMS Secretariat and the potential new Collaborative Institutions. While these last ones seem satisfied, the document might still have to be adjusted according to the last clearances from the FAO Legal and Communications Departments. Collaborative Institutions (national institutions, INGOs and NGOs) will be introduced in the FIRMS Partnership by an existing FIRMS Partner as an expansion of the FIRMS Partnership controlled through the “FIRMS Collaborative Arrangement”. Collaborative Institutions will be able to provide information and services and may also have a technical advisory role, but will not have right to vote therefore will not be required to attend FIRMS meetings in person; however attendance is encouraged either in person or through remote participation.

25. The Annex 2 of the Collaborative Arrangement is based on the template of the FIRMS Partnership Arrangement, with specific text to be agreed by the signatory Collaborative Institutions. The Collaborative Arrangement details the nature of material and services and the conditions under which the arrangement is made, including any additional entitlements that a collaborative institution may wish to include.

26. Ms Anton also presented the proposed draft amendments to the Rules of Procedures of the FIRMS Steering Committee (FSC11/2019/15). Two new sections were added to accommodate the new role of the Collaborative Institutions. Section 4, which states the protocol to follow by the Collaborative Institutions’ representative at meetings; and Section 12, which explains how the new Collaborative Institutions can be incorporated in FIRMS Partnership.

27. The new Collaborative Arrangement was adopted and the proposed amended Rules of Procedures were validated under item 10.

### ***Prospective new FIRMS Collaborative Institutions (Agenda item 3c)***

28. FSC11 noted that four prospective Collaborative Institutions were currently developing arrangements to join FIRMS: SFP, UW (FSC11/2019/7), IRD (FSC11/2019/10), and MSC (FSC11/2019/Inf.13). FSC11 also noted that UW had provided a letter of intent to cover the period during which its arrangement could be finalized. Although some of the collaborative

arrangements were in an advanced stage of development, none were ready for signing during the meeting.

29. Ms Susana Segurado (SFP) outlined the role of SFP and its contribution to GRSF. SFP manages FishSource, which is one of the three data sources currently contained in GRSF.

30. Mr Peter Hair (MSC) reported on the existing MoU between MSC and SFP. The GRSF data standards could open up new opportunities for new collaborations. The GRSF and the globally unique Fishery ID would allow MSC to further improve the existing data proposition for internal and external partners. For instance, it could allow for more insight into global stock performance, fishery assessment overlap and ultimately increase interoperability. This would also create opportunity for new collaborations and research, create connectivity with new data for setting baselines, monitoring and evaluation, and further ease the burden of data sharing.

31. Mr Taconet noted this potential to expand the FIRMS partnership, and recalled that MSC had been involved in BlueBRIDGE where the GRSF was being developed.

#### **4. ANNEX 2 - REVIEW OF THE PROPOSED MODIFICATIONS OF EXISTING PARTNERS (AGENDA ITEM 4)**

32. Ms Cummings invited the two new Partners to outline the context of their Partnership Arrangements, as described in Annex 2 of the arrangements.

33. Mr Nadje Dedi reported that FCWC has requested assistance from FAO to develop methods to collect and manage data from small-scale artisanal fisheries and large-scale industrial fisheries, which operate in FCWC's area of competence. Data, including socio-economic data, are current inputs for a central regional database. FCWC recognised the importance of these data in monitoring status and trends, and the role that FIRMS may provide to assist in this work.

34. Mr Carlos Monteiro (CECAF) expressed the will to improve the CECAF data sharing with FCWC.

35. Mr Loveridge reported that SPRFMO will provide data already currently available on their website. The data would cover jack mackerel, which is assessed regularly, and the orange roughy fishery, which has a preliminary stock assessment. Data would also be provided on jumbo squid where no approved stock assessment process is yet in place. Data on other species would be provided when possible.

36. FSC11 also noted that RFBs provide a conduit for the flow of information from countries to FIRMS, which appears in FIRMS as fleet segments.

37. Mr Fabio Fiorellato noted that IOTC may consider adding Blue Shark to its Annex 2 of the Partnership Arrangement.

## **5. REVIEW OF FIRMS ACTIVITIES DURING THE INTER-SESSION (AGENDA ITEM 5)**

### ***Report on inter-sessional activities (Agenda item 5a)***

38. Mr Aureliano Gentile reported on the Secretariat's progress and issues arising (FSC11/2019/2). Eleven partners provided a report of their activities: CCAMLR, GFCM, IATTC, ICCAT, ICES, IOTC, NAFO, NASCO, SEAFDEC, SEAFO and WECAFC. The Secretariat's report on FIRMS activities carried out during the intersession includes: marine resource and fishery modules, database content, fact sheet layout improvements, coverage maps, web trends, applications development, training, promotional activities, Secretariat resources in support of FIRMS, difficulties encountered, and planned activities for the next intersession. Some of these topics were addressed in more detail, as reported below.

39. Time trends and breakdown by FAO major fishing area of inventory and fact sheets were presented. The total number of inventoried marine resources in the database was 1 479, and the largest number of contributions from ICES, WECAFC and CECAF. There are now 751 fisheries inventoried, mostly from CECAF and WECAFC; however, many CECAF components although submitted have not yet been validated and published.

40. Beyond the regular workflow and dissemination activity by FIRMS partners and Secretariat, the following was accomplished during the intersession:

- Marine resources module: i) CCSBT, CECAF, IATTC, ICES, NAFO, SWIOFC, WECAFC: enriched inventories or new fact sheets were published, ii) RECOFI agreed to update RECOFI-FIRMS National Focal point list and organise RECOFI Session, Rome, June 2019, iii) fact sheet updates are in progress for: CCAMLR, ICCAT, and IOTC.
- Fisheries module: i) there were updates in the fishery fact sheets for: IATTC, NEAFC and WECAFC for which 13 new fishery records were added for a total of 25 national fisheries published so far along the WECAFC-FIRMS collaboration, ii) updates are in progress for: CCAMLR, NAFO and NASCO.
- Fact sheet update turn-over by Partners since 2004 has fluctuated without a clear trend, achieving by April 2019 a total production of 1 433 marine resource fact sheets and 311 fishery fact sheets.

41. Mr Gentile recalled the minimum data requirement approach and the utilization of web-services for ICES semi-automatic procedures for the updates of their stock status reports.

42. In terms of website improvements: i) further upgrades of the Stocks and Fisheries map viewer produced 783 Marine Resources placemarks and 258 Fisheries placemarks, ii) regarding the state and trend traffic light icons; IATTC, ICCAT, ICES, NAFO and SEAFO have adopted the display in the Marine Resources module.

43. In terms of web-services: i) Marine Resource and Fishery fact sheets can be returned in HTML, or in XML formats, ii) State and Trend Summaries can be downloaded as Excel files for further analysis, iii) web-services are available enabling users, Partner's websites or systems to query and retrieve specific subsets of fact sheets given an area or a species in the following formats: XML, JSON, Excel and HTML, and iv) geospatial web-services are also

available for embedding maps in partners' websites including a customizable version of the new Stocks and Fisheries map viewer.

44. Regarding the overall upgrade of the FIRMS website, document FSC10/2017/4e "Design proposals for the new FIRMS Website" presented at FSC10 was recalled. The Office for Corporate Communication (OCC) produced a mock-up, in collaboration with the FIRMS Secretariat, for the new FIRMS Website under FAO.org. This activity is on hold awaiting the major upgrade of the FI fact sheets module ([www.fao.org/fishery/species/search/en](http://www.fao.org/fishery/species/search/en)).

45. In terms of the development of applications during the intersession: i) Word/Excel-to-XML converter tool was further configured for the "minimum data requirement" approach and massively utilized to produce reference observations and fact sheets, particularly for the ICES-to-FIRMS semi-automated procedure; ii) added support for time series data (e.g. catch/landings, including dynamic harvesting from ICES web services).

46. As for the development of mapping applications: the ongoing updates on the FIGIS integrated mapping module produce positive side effects on FIRMS, specifically: i) faster map loading and display, and a better support for mobile and tablet devices; ii) fisheries/marine resources data layer are regularly updated through a semi-automated data processing flow, also available at FAO GeoNetwork, and iii) additional layers could be potentially exploited in the FIRMS Stocks & Fisheries map viewer.

47. Regarding completing FSC8, FSC9 and FSC10 decisions, the following tasks remain pending: i) indicator of data reliability - Fishery importance, ii) partners' logo in the fact sheets, iii) alternative layouts for: No longer monitored marine resources (Monitoring period).

48. Concerning training and capacity-building activities, the FIRMS Secretariat ensured a continuing remote technical support capacity to partners in their information contributions to FIRMS, or in the development of their inventories or reporting templates. In addition, the following workshops were carried out:

- Data Preparation Workshop (Barbados on 23 – 25 October 2018) arranged under the CLME+ project, specifically under the component "Shrimp and Groundfish Fisheries of the North Brazil Large Marine Ecosystem".
- FCWC-FIRMS Workshop (Liberia, November 2017) within the context of the TCP/RAF/3512 "Strengthening routine fisheries data collection in West Africa: Benin, Côte d'Ivoire, Ghana, Liberia, Nigeria, Togo and Fishery Committee of the West Central Gulf of Guinea (FCWC)".
- Two WCPFC-FIRMS case studies showcasing, the possible contribution to the FIRMS knowledge base were developed based on the publication "*The Western and Central Pacific Tuna Fishery: 2016 Overview and Status of Stocks*".

49. Concerning the promotional and outreach activities, the FIRMS Secretariat attended 11 RFB statutory meetings, 2 conferences, and 4 project meetings were attended during the inter-sessional period. These include:

- CECAF-PESCAO project (Akosombo, Ghana, April 2019)
- RECOFI WGFM11 (Muscat, Oman, February 2019)
- 7th SPRFMO annual meeting (The Hague, Netherlands, January 2019)

- GFCM FishForum 2018 (Roma, Italy, December 2018)
- OSPESCA Regional Directors meeting (December 2018)
- WECAFC SAG9 (Bridgetown, Barbados, November 2018)
- 3rd Meeting of the CFMC/OSPESCA/WECAFC/CRFM/CITES Working Group on Queen Conch (Panama city, Panama, 30 October – 1 November 2018)
- Innovative data management services for sustainable fisheries and aquaculture (Copernicus, Brussels, October 2018)
- NBSLME - Data Preparation Workshop (Bridgetown, Barbados, October 2018)
- CECAF SSC8 (Abidjan, Côte d'Ivoire, October 2018)
- 4th Geo Blue Planet Symposium (Toulouse, France, July 2018)
- Seventh Meeting of Regional Fishery Body Secretariats Network (RSN-7) (Italy, Rome, July 2018)
- WECAFC/CRFM/IFREMER Shrimp & Groundfish Working Group (UN House, Barbados, May 2018)
- Joint OSPESCA/WECAFC/CRFM/CFMC Caribbean Spiny Lobster Working Group (Dominican Republic, March 2018)
- FCWC-FIRMS Workshop (Monrovia, Liberia, November 2017)
- FAO-WECAFC Shrimp and Groundfish CLME+ sub-project Launching Workshop (Port of Spain, Trinidad and Tobago, November 2017); and
- WECAFC SAG8 (Merida, Mexico, November 2017).

50. Regarding the allocation of resources to FIRMS activities, the analysis showed that while stepping into the new FAO Strategic Framework and from 2015/16, the Regular Programme support to FIRMS has been strengthened. This strengthening of the FIRMS programme has been as a priority area for the Fisheries and Aquaculture Department, under the FAO Strategic Objective 2 “Sustainable use of natural resources”, with the focus on supporting information contributions and expanding the Partnership. FIRMS growth has also materialized through extra-budgetary sources mobilized by the Secretariat.

51. As for difficulties encountered during the inter-sessional activities, it was highlighted that a substantial turnover of the FIRMS Secretariat compounded with more stringent HR policies has weakened its capacity during the second part of the inter-sessional period. In addition, new FAO corporate policies on IT and communication entailed substantial delays for some deliverables. Some delays took place with partners regarding information provisioning and, in some cases, stock/fishery status reports are still awaited. However, the minimum data requirement approach in force since FSC10 contributed to a faster workflow and a lighter workload while focusing on key information of the marine resource and fishery modules. The semi-automatic procedure supported by web-services, instituted with ICES, has also proved its effectiveness for such massive updates of information.

52. The document and activities conducted during the intersession were discussed by the participants and were well received.

53. In response to a query from Mr Ricardo Federizon (NAFO), FSC11 noted that not all inventories and fact sheets are updated annually, and some are updated every 2 or 3 years. This practice is not fully reflected in the reported statistics, and apparent delays may be interpreted as untimely contributions when in fact such contributions are being provided in a

timely manner at multi-year intervals. Partners are requested to submit information when available, subject to technical and human resource capacities. This is generally done shortly after the RFB has completed its update and review cycle.

54. IOTC and GFCM expressed interest in generalizing automated procedures such as the procedure used to dynamically retrieve information from ICES.

55. FSC11 noted that the ICES procedure was semi-automated and still required some manual input. However, such procedures were valuable in promoting standards and speeding up the upload process.

56. Ms Segurado expressed support for the wider use of automated procedures, including where applicable to development software that produces a standard output, which can be uploaded to FIRMS.

57. Mr Yimin Ye (FAO) thanked the Secretariat for summarizing the inter-sessional work. He suggested that next report of activity shall include insights of the geographic coverage of FIRMS relative to the total number of stocks and fisheries in a given area, as well as what percentage of the global catch is reported in FIRMS.

58. FSC11 noted the use of data calls to improve the timeliness of data updates, and agreed calls could be timed to coincide with each Partner's update cycle. A round-the-table discussion indicated that partners' preferred timing for updating FIRMS information was as follows:

<b>Partner</b>	<b>Preferred timing for data call</b>
CCAMLR	January - February
NAFO	Update as required
FCWC	Probably early in year, new to process
SPRFMO	March - August
IOTC	January - March
CECAF	January - March
NEAFC	January - March
GFCM	Various times during the year
WECAFC	Not yet identified; new to process
SEAFDEC	Not yet authorized to submit data to FIRMS; will required further consultation

59. This discussion indicated that the first quarter of the year could be identified as a preferred data call timing while other partners still require more time to identify the suitable timing. Possibly, two data calls (1<sup>st</sup> and 3<sup>rd</sup> annual quarters) could be considered.

60. When considering the web trends for the last inter-sessional period, the following were noted:

- An overall increase of the FIRMS usage (both in the number of visits and pages viewed) although with negative fluctuations in 2012, 2014 and 2018.
- The negative trend reflected in 2018 was most likely due to a deficient availability of the FAO web server with frequent downtimes (to be further investigated). The server experienced a total downtime of about 33 days, i.e. 9 percent of time

unavailability. It should be noted that this 9 percent unavailability closely matches the negative difference between 2017 and 2018 for the number of sessions.

- As sources of traffic, 43 percent of visitors access FIRMS through search engines (mostly Google), about 41 percent reach FIRMS through referral sites and 16 percent of visits is due to direct traffic.
- Mostly North American, then European countries are the regions with the highest level of visits, with the majority of the visits made by English-based browsers.
- Mobile devices: 2016–2018 indicated a growth of total sessions of mobiles (now sharing 15 percent of the overall traffic) and tablets (3 percent) vs desktop. This type of traffic nearly doubled in comparison with the previous analysis made for FSC10, where the share for mobile devices was about 9 percent.
- Among the top landing pages, there are the home page (52 percent, <http://firms.fao.org/firms>), the Tuna resources and fisheries pages (19 percent, <http://firms.fao.org/firms/fishery/459/en>), followed by the Fisheries Fact Sheets Search (7 percent, <http://firms.fao.org/firms/fishery/search/en>) and several other fact sheets. The FIRMS Concepts and Definitions is still among the top visited pages. There were some other recent changes to the top ten landing pages compared to the 2007–2016 review, with the Malaysia Shark Fisheries and the World Deep-sea fisheries now appearing.
- Stocks and Fisheries map viewer (from February 2017) showed: i) a higher average session duration (00:03:41 vs. 00:02:34), ii) a higher ratio of pages per session (2.99), and iii) it would be positioned within the top ten landing pages if the analysis is constructed from the time of its release until December 2018.
- The preliminary positive trends for the current year give a positive outlook for 2019 and the FIRMS Stocks and Fisheries map viewer is expected to further contribute.
- There would be the need of an improved compatibility of FIRMS website for mobile devices so as to be better ranked by Google. Also, efforts should be allocated for the search engine optimization concurrently with the new fact sheets module developments.
- FAO domain pages are often ranked higher than FIRMS. The possible migration of FIRMS under FAO.org should result in an increase of the overall web trends.
- Referral traffic is an important source of accessing FIRMS and is also due to website cross-referencing (e.g. FIRMS fact sheets to the FAO Fishery and Aquaculture Country Profiles fact sheets and FishBase). Generally need to proceed with a strong communication plan agreed upon and supported by all FIRMS partners.

## **6. REPORT OF E-TECHNICAL WORKING GROUP 6.0 (SUMMARY REPORT OF TWG 6 AND E-TWG 6.1-6.2) (AGENDA ITEM 6)**

61. Mr Gentile reported on the activities of the FIRMS Technical Working Group (FSC11/2019/3). Three TWG meetings were held during the inter-sessional period, two e-meetings (TWG 6.1 December 2017 and TWG 6.2 April 2019), and TWG 6 jointly held with the BlueBRIDGE TWG3 on GRSF which was took place between the 7th of February and the 9th of February 2018 in Rome, Italy. The TWG online sessions addressed: i) the introduction of two new standard descriptors and their definitions for “Biological stock” (Yes, No, Unknown)

and Assessment Unit (Yes, No) to replace the current descriptor “Considered as a single stock”, ii) the definitions for two controlled terms (“Highly migratory”, “Straddling between high seas and EEZ”) of the descriptor “Jurisdictional distribution”, and iii) the definition for the descriptor “Spatial scale”. See Annex 6 for the full text of the definitions and see Agenda item 9 for final decisions.

62. FSC11 noted that there may be a need by some Partners to refer to territorial waters which may not be included in the UNCLOS definition of EEZ. Mr Loveridge agreed to seek the source of these definitions and report back to the meeting.

63. The TWG6 meeting in 2018 was recalled here as this matter was discussed under its Agenda item 7. TWG6 was focused on GRSF and addressed the following topics: i) value proposition and development status, ii) business model, iii) governance and business plan, iv) response to FSC10 concerns.

## **7. FIRMS GOVERNANCE LEADERSHIP ON THE GLOBAL RECORD OF STOCKS AND FISHERIES (GRSF) (AGENDA ITEM 7)**

64. Mr Gentile reported on the Global Record of Stocks and Fisheries (FSC11/2019/5).

65. GRSF was part of a FAO initiative that received support from FIRMS Partners and was funded by the European Union Horizon 2020 BlueBRIDGE project (2016-2018). GRSF has been developed in collaboration FAO, the FIRMS Partnership (Fisheries and Resource Monitoring System), the University of Washington (UW, RAM Legacy Stock Assessment Database) and FishSource, and is an online information resource about the status of fish stocks and fisheries created by the Sustainable Fisheries Partnership (SFP) in 2007.

66. The technical development of GRSF was carried out by the Italian Consiglio Nazionale delle Ricerche (CNR-ISTI) and the Greek Foundation for Research and Technology - Hellas (FORTH), both partners in the BlueBRIDGE project. During the BlueBRIDGE project, the formulation of the requirements and the development of the GRSF were discussed in seven Technical Committee meetings, three Technical Working Group meetings, two Advisory Board meetings and more than 60 conference calls. The GRSF takes advantage of the iMarine Data e-infrastructure and its open-source software, both open-source (e.g. CKan data catalogue) and proprietary (e.g., MatWare for semantic warehouse). The GRSF is currently disseminated through the GRSF catalogue in iMarine.

67. Further development of the GRSF application has continued after the end of the BlueBRIDGE project (February 2018) thanks to the effort of CNR, FAO, FORTH, SFP and UW. UW and SFP are currently working in collaboration with the FIRMS Secretariat to test the application, identify technical issues and validate GRSF records.



68. GRSF currently includes three data sources:
- RAM Legacy Stock Assessment Database (<https://www.ramlegacy.org/>) mostly covering officially published assessments of shared and national stocks in North and South America, Europe, Japan, New Zealand, Australia, South Africa, Northwest Africa, and Tuna Regional Fisheries Management Organizations.
  - FIRMS (<http://firms.fao.org/firms/en>) covering stocks and fisheries according to the area of competence of its partners and underlying member countries all over the world with a smaller coverage in the Pacific and in South America while more information is available for Africa and increasingly for the Caribbean in comparison to the other two databases.
  - FishSource (<https://www.fishsource.org/>) which focuses on providing major seafood buyers with up-to-date information on fisheries and the connected stocks status, when available. The FishSource data coverage currently reflects the fisheries from which their partners and their suppliers source from (i.e. American Continents, Europe, Australia and New Zealand, South East Asia).
69. FSC11 noted the following key components of GRSF:
- data model, standards, unique identifiers, and time dependent data;
  - FIRMS involvement;
  - proposed pilot release;
  - potential users, benefits of GRSF, and how it can be used;
  - GRSF business model, proposed governance, and status of the agreements;
  - envisaged resources to support GRSF;
  - ownership of the GRSF records; and
  - proposed work plan.
70. Within the GRSF information domains “*Stock*” and “*Fishery*”, the “*Assessment Unit*” is characterized by a species item and assessment area(s), the “*Fishing Unit*” is characterized by one target species item, fishery area(s)/management area(s), management authority(ies) with associated jurisdiction area(s), one gear type, and one flag state.
71. Mr Isara Chanrachkij (SEAFDEC) requested clarification on the use of target species in this definition. Ms Susana Segurado (SFP) indicated that the definition could be clarified by referring to ‘caught species’ instead of ‘target species’, thereby allowing bycatch to be used to characterize a fishing unit.
72. Mr Yimin (FAO) further noted that it might be difficult to identify whether a species is specifically targeted or not, especially when there are many different types of gear being used by one vessel/fishery. It may not necessary to separate these items but it is difficult to capture all the information.
73. In this regard, the FIRMS Secretariat clarified that the GRSF fishing unit has no bearing on whether the concerned species is a target species or not (e.g. other species or bycatch). Furthermore, the list of unique stocks and fisheries can have different pathways, the stocks as an authoritative repository of validated and approved list of assessment units, and the fisheries as a service to generate unique identifiers for fishing units upon requests by users (for example fisheries institutions, industries, retailers etc.).

74. The FSC11 also noted that:
- GRSF provided a 'yellow page' of stock UUIDs (i.e. unique identifiers);
  - fishing unit UUIDs are assigned as required to reported instances noting that not all the gears catch all the species;
  - Stocks and Fisheries can be connected in the GRSF knowledge base, and the stocks can be flagged for SDG and fisheries can be flagged for traceability purpose; and
  - the stock identifiers can be linked back to FIRMS, RAM and FishSource databases.
75. FSC11 also noted that stock identifiers are based on ASFIS species codes ([www.fao.org/fishery/collection/asfis/en](http://www.fao.org/fishery/collection/asfis/en)) and assessment area codes. For species not listed in ASFIS, the WoRMS Aphia ID ([www.marinespecies.org/index.php](http://www.marinespecies.org/index.php)) will be consulted.
76. FSC11 recalled the FSC10 recommendation that FIRMS take governance leadership on the GRSF and this process was further informed by TWG6. FIRMS' involvement in GRSF began in 2015 and the GRSF pilot is nearing release. The benefits of GRSF include:
- global standard of stocks and fisheries based on unique identifiers;
  - support to monitoring reporting and disseminating SDG 14.4.1;
  - support to seafood traceability; and
  - boost the connected knowledge.
77. Mr Michael Melnychuk (UW, remote participation) presented background information on the RAM Legacy Stock Assessment Database (<https://www.ramlegacy.org/>), noting the following points:
- database is being maintained by UW;
  - database coverage restrained to countries which have submitted stock assessments, and is highly biased towards countries that conduct assessments;
  - data are publically available via website ([ramlegacy.org](http://ramlegacy.org)) or database (Zenodo, <https://about.zenodo.org/>);
  - extensions to the RAM database include additional analyses (standardizations) and statistical analyses to look at underlying trends, estimating missing points, stock distributions areas, biomass coverage etc.;
  - surplus production models are used to provide assessments for stock status for all stocks in the database;
  - desire to expand geographic coverage, expand data availability and have a greater coordination with FishSource, as well as integrate into the GRSF; and
  - most of the regions that are covered have been covered for decades, others like the Mediterranean have a very short time series. Time series of biomass are also available.
78. Mr Yannis Marketakis (FORTH, remote participation) outlined the role of FORTH (the Institute of Computer Science of the Foundation for Research and Technology – Hellas FORTH-ICS) in developing GRSF. FORTH is a renowned research institute in Greece in the area of ICT that also represents Greece with the ERCIM network of European ICT institutes. FORTH-ICS has a long expertise in coordinating and participating in European, national and international projects. Among others, FORTH-ICS activities include: i) knowledge representation and reasoning and ii) web data knowledge integration and adaptation. As part

of the history, FORTH-ICS initiated their activities with the marine domain in two different projects. In the FP7 iMarine project, FORTH-ICS designed and developed the Marine Top Level Ontology (TLO), a core conceptual model able to capture the semantics of the marine domain, and constructed the MarineTLO-based warehouse that integrates data coming from five different sources (i.e. FAO Fisheries Linked Open Data, IRD Ecoscope, FishBase, WoRMS and DBpedia).

79. In the H2020 BlueBRIDGE project, FORTH-ICS extended MarineTLO ontology and exploited it for constructing the GRSF Knowledge Base, which integrates data from three difference data sources (FIRMS, RAM Legacy Database, FishSource), and developed a set of services for publishing, updating and exposing GRSF records. During the past two months FORTH-ICS and FAO started working on two documents: (i) the collaborative arrangement between FIRMS and FORTH-ICS, which FORTH-ICS is committed to in order to support the maintenance of the GRSF Knowledge Base; and (ii) a Service Level Agreement (SLA) between FAO and FORTH-ICS to support the provision of services to maintain the operational status of GRSF.

80. A demonstration of the GRSF pilot release was given at the close of the afternoon session.

81. Mr Taconet outlined GRSF matters which required further consideration by FSC11 including:

- confirmation of commitments;
- endorsement of proposed arrangements and Governance;
- feedback on the envisaged resources;
- identify arrangements for the public release of GRSF; and
- provide views on the promotion and potential use of GRSF and what activities need to be envisaged.

82. In considering these matter, FSC11 noted the following:

- Stocks and Fisheries UUIDs are assigned automatically in the GRSF to all approved records generated from the source databases (FIRMS, RAM, FishSource), however partners will review such identifiers allocation.
- A stock UUID can be linked to a fishery UUID, particularly an assessment unit can be connected to a fishing unit. This connection is so far a manual process and partners may chose to undertake this task.
- Where there is an overlap in the information arising from multiple sources in a GRSF record, the information provided by a partner may need to be indicated as the authoritative information and the Partner may decide to maintain other information in the GRSF record as ancillary or not. It was also noted that so far, the GRSF is not offering this feature, in any case each datum is properly referenced and data are collated but not altered.
- Partners minimum commitment to GRSF (i.e. level zero option) would consist of reviewing and validating the UUIDs for stocks and/or for fisheries and the FIRMS Secretariat would initiate the process by providing each partner with a list of stocks, indicators and UUIDs for review.

83. FSC11 noted that the SDG indicator 14.4.1 may eventually become a source of data for GRSF, and further consideration may need to be given during development to allocation of stock UUIDs originating from that source. Similarly, SOFIA indicators may also feed into GRSF.

84. FSC11 noted that countries contributing SDG indicators may include RFMO or shared stock indicators in their national inventories, and the use of UUIDs would facilitate FAO's SDG task to handle such indicators properly in order to avoid double accounting issues.

85. FSC11 noted that the requirements to review and validate stock UUIDs would only represent a modest increase in Partners' annual commitments to FIRMS. However, GRSF requirements greatly increased the workload of the Secretariat, especially during the development of the system.

86. FSC11 discussed the development and public release of the GRSF pilot. It was noted that further bug fixes, testing and validation is required prior to release, and a release during a major fishery event would be desirable. FSC11 identified the FAO International Fishery Symposium to be held in November 2019 as a suitable event for releasing and promoting the GRSF pilot. Another suitable event is COFI held in 2020, given the potential use of GRSF in policy.

87. FSC11 reviewed the governance model for GRSF (FSC11/2019/5) and requested that the Secretariat clarify some of the linkages and processes in the schematic diagram. Following further discussion, the governance model was revised as reported in Agenda item 10.

## **8. FIRMS GOVERNANCE LEADERSHIP ON THE TUNA ATLAS (AGENDA ITEM 8)**

88. Mr Taconet introduced the Tuna Atlas (FSC11/2019/6) and outlined the recommendations of the Technical Workshop on Global Harmonization of Tuna Fisheries Statistics<sup>1</sup> (March 2018) for FIRMS to take Governance leadership of the atlas. The general objectives of the Tuna Atlas are to:

- improve the science-to-policy interface and communication on topical issues concerning tuna and tuna like species fisheries to the general public;
- improve transparency through open, reproducible and collaborative science;
- improve recognition of tuna RFMOs as source data providers; and
- foster global research on fisheries related matters by facilitating access to tuna fisheries observations.

89. The development and production of the Tuna Atlas requires skills to manage both technical and statistical aspects of tuna fisheries data, and collaboration between data managers and statisticians. A collaboration between FIRMS Partners in particular tuna RFMOs (t-RFMOs) and FAO is proposed to occur under the governance of the FIRMS Partnership in order to share, maintain and update a single workflow which provides integrated datasets and data services and makes these accessible online in the future through the Tuna

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<sup>1</sup> Workshop report at [www.fao.org/documents/card/en/c/CA3132EN](http://www.fao.org/documents/card/en/c/CA3132EN)

Atlas. The proposal articulates the objectives of the Tuna Atlas, and describes the product, workflow and roles for its maintenance under various scenarios.

90. The proposed model for the operations of the Tuna Atlas under the FIRMS governance was described, as well as the resources envisaged for its maintenance in particular through formal arrangements among public agencies. Such resources include collaboration with IRD as FIRMS collaborative institution. Citation and acknowledgement of the Atlas' various components were reviewed, and the work plan for the official release of the Atlas was presented, along with an overview of potential future developments.

91. Mr Julien Barde (IRD) summarised the technical work undertaken by IRD in the production of the Tuna Atlas since 1997 when Alain Fonteneau initiated the first global Tuna Atlas, an initiative which continuously improved until 2018. IRD activities related to the Tuna Atlas deal with statistical aspects and data management with a growing focus on FAIR data management principles, especially interoperability. The database is loaded from a workflow using R and SQL code to generate global datasets with different levels of processing. The Tuna Atlas provides:

- Metadata. The standardization of metadata (compliance with OGC standards) is the result of a collaborative work achieved with FAO.
- Data with different levels of processing where:
  - Level 0 dataset (harmonized; with no extrapolation) stores nominal catch and effort data as close as possible to the primary data collated from countries and made publicly available by t-RFMOs.
  - Level 1 dataset uses Level 0 data as inputs. There is harmonization of units of measures for catches which can be by weight or in number of fishes or both weights and numbers in the same stratum.
  - Level 2 dataset is generated from Level 0 data with additional corrections and raising factors.
- Code (R and SQL) to process the metadata and data (harmonized global datasets). Loads them into the SQL data warehouse and creates metadata and data services.
- DOIs and attached metadata (title, abstract, authors, bibliographic citation) have been assigned to IRD metadata, data and code.

92. Mr Barde indicated that a prerequisite to IRD's proposed collaborative arrangement was an agreement by t-RFMO data providers to implement the CWP reference harmonization standard once endorsed by CWP.

93. Mr Taconet outlined three scenarios for achieving the objectives of the Tuna Atlas within FIRMS (FSC/2019/6):

- Scenario 1 - FIRMS approved Level 0 dataset, minimum involvement of FIRMS partners;
- Scenario 2 - FIRMS owned Level 0 dataset, optimum involvement of FIRMS partners; and
- Scenario 3 - FIRMS owned Level 1/2 datasets, thorough involvement of FIRMS partners.

94. Mr Taconet also outlined Tuna Atlas matters which required further consideration by FSC11 (FSC11/2019/6) including:

- business model;
- governance model (similar to that developed for GRSF);
- status of arrangements;
- required resources; and
- proposed work plan.

95. FSC11 noted that the proposed work plan identified milestones and main activities required in the short term for the release to the public of the FIRMS Tuna Atlas, as well as in the medium term (at least 3 years) for the enhancement of the workflow. In addition, part of this work plan may occur, subject to funding, under the BlueCLOUD project<sup>2</sup> including the necessary enhancement of R code for alignment with the CWP reference harmonization standard, and any steps that would be identified to proceed collaboratively regarding Levels 1 and 2 (refer to paragraphs 101 to 104).

96. In considering these matters, FSC11 noted the following:

- The Atlas focusses on tuna and includes tuna-like species.
- The definition of tuna-like species is related to an RFMO's interests and mandate and this grouping is often made with reference to highly migratory non-tuna species. Noting that some billfish statistics are already in the Atlas, Tuna-like species generally may, or may not include billfish, mackerels and pelagic sharks.
- The information in the Atlas is currently disseminated using multiple channels (map viewer, web services, database).
- The Atlas may eventually be expanded to become a fishery atlas, which includes other species of interest to FIRMS Partners.

97. FSC11 noted that IOTC, ICCAT and IATTC (vis correspondence, refer to paragraph 96) had expressed their support for Scenario 2 using Level 0 data, with an annual data call made to t-RFMOs around November/December each year. The application of CWP standards in Scenario 2 is conditional on the CWP discussion on reference harmonization at CWP-26, which is scheduled back-to-back with FSC11.

98. IOTC and ICCAT advised that the implementation of CWP standards (once endorsed by CWP) could be undertaken during 2019.

99. Mr Taconet noted the support for the Tuna Atlas proposal notified by IATTC prior to the FSC11 meeting, confirming their commitment to provide on a yearly basis the Level 0 aggregated datasets based on agreed temporal and spatial definitions (5 by 5 degrees per year for longline and 1 by 1 degree per year for purse seine). Depending on workload and availability, IATTC could try to fit with Scenario 2 in order to produce datasets compliant with the CWP standards and in line with the Tuna Atlas requirements.

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<sup>2</sup> The BlueCLOUD project was confirmed to be funded two weeks after FSC11

100. Mr Taconet noted the concerns expressed by IOTC and ICCAT in terms of producing Level 1 and 2 datasets, and that for this reason further work is needed in collaboration with IRD to assess the feasibility of this data production.

101. Mr Anton Ellenbroek (FAO) introduced two proposals, in support of the future development and the envisaged resources for the Tuna Atlas and GRSF, which are currently under consideration for funding under the H2020 initiatives: BlueCLOUD and FoodCLOUD.

102. BlueCLOUD is a natural evolution of BlueBRIDGE and EMODNet services to demonstrate the capacity of the European Open Science Cloud (EOSC) to support and better manage the many aspects of ocean sustainability, through a set of five varied pilot BlueCLOUD demonstrators. BlueCLOUD has 18 partners including CNR-ISTI, FORTH, IRD, Ifremer and is a pilot for future full-scale activities.

103. FAO is proposing involvement in two demonstrators:

- A demonstrator entitled 'Fish: a matter of scale' which consists of:
  - Fisheries Atlas: further develop the data ingestion tools of the Global Tuna Atlas and linkages to external reference data sources. Improve connection to computational environment (R and Dataminer) and data storage. Promote use of R-Shiny modules for end-user exploitation of data and analyses.
  - GRSF – additional features for data management and validation (including Food).
- A demonstrator on aquaculture monitoring with remote sensing data.

104. FoodCLOUD contributes to the FOOD 2030 vision by engaging European and international FNS research communities in EOSC, through a distributed e-Infrastructure known as the FNS Data Commons (the "Food Cloud"). FoodCLOUD has 24 partners and is a pilot for future networks. FAO will focus on collecting food composition data, and connect to BlueCLOUD. GRSF would provide UUIDs useful to connect Fisheries and Food data, and may be used to disseminate FoodCLOUD information through GRSF.

## **9. FIRMS PROTOCOL AND STANDARDS (AGENDA ITEM 9)**

105. FSC11 considered the following proposed updates to the Information Management Policy (IMP) (FSC11/2019/14):

- addition of the traffic light approach under the Annex 1.3 - FIRMS Stock Status descriptors; and
- addition of TWG6 reviewed definitions under Annex 2 FIRMS draft guidelines.

106. In considering the traffic light approach for stock status indicators, FSC11 noted that:

- FIRMS has foreseen to use two categories: 'not overfished' (green light) and 'overfished' (red light). However, these are not yet in use in the FIRMS fact sheets.
- Similarly, COFI uses two categories: '*biologically sustainable*' and '*biologically unsustainable*'.
- FAO uses three categories: '*underfished*', '*maximally sustainably fished*' and '*overfished*'.

- The two FIRMS categories can be mapped to the three FAO categories: *Not overfished* maps to *underfished* and *maximally sustainably fished*, and *overfished* is the same in both systems.
- In mapping these two systems, FIRMS has assigned a green light to *underfished*, a yellow light to *maximally sustainably fished*, and a red light to *overfished*.

107. FSC11 agreed that the use of a yellow light for *maximally sustainably fished* is misleading, and referred this matter to TWG for any further review. *Maximally sustainably fished* is recognized by the UN as a target level and this level should be assigned a green light (**FSC11/D9.1**).

108. The TWG reviewed definitions which were considered under Agenda item 6 (i.e. '*Highly Migratory*' and '*Straddling between high seas and EEZ*'). These definitions were based on UNCLOS, where UNCLOS defines an EEZ as an area beyond and adjacent to a territorial sea. The IMP contains four other definitions related to jurisdictional areas, and FSC11 proposed that those definitions be also reviewed by TWG in the next inter-session.

109. With this clarification, FSC11 endorsed the revised definitions ('*Highly Migratory*' and '*Straddling between high seas and EEZ*'), and referred the other definitions related to stocks' jurisdictions (paragraph 108) to TWG for further review (**FSC11/D9.2**).

110. FSC11 approved the definitions of '*Biological stock*', '*Assessment unit*', '*Management unit*', and '*Spatial scale*', and agreed that these definitions be added in the IMP as part of the FIRMS standards (**FSC11/D9.3**). See Annex 6 for full content definitions.

## **10. REVISED FIRMS GOVERNANCE STRUCTURE (AGENDA ITEM 10)**

111. FSC11 recalled the discussion of the proposed Collaborative Arrangement under Agenda item 3b. The arrangement was developed in consultation with the FAO legal office, and facilitates the inclusion of collaborative institutes within the FIRMS partnership.

112. In considering this Arrangement, FSC11 noted that:

- the termination period was set at 3 months, and this was deemed too short a period under certain circumstance to organize an orderly conclusion or transfer; and
- further minor editing was required where the word 'partners' had not been changed to 'collaborative institutions'.

113. FSC11 agreed to extend the notice for termination period from 3 to 6 months. With this change, and noting the minor edits above, FSC11 adopted the Collaborative Arrangement and validated the amendments proposed within the Rules of Procedure (**FSC11/D10.1**).

114. The FSC11 Chairperson again encouraged Collaborative Institutions to attend FSC meetings as well as the technical working group meetings as their contributions are important to the continuing work of FIRMS. Such Contributions may be done by remote participation.



***Concluding statements on governance leadership for the GRSF and the Tuna Atlas (Agenda item 10c)***

**Governance model**

115. FSC11 recalled that the Governance models for GRSF and the Tuna Atlas had been discussed under Agenda item 7 and 8. In further discussion, FSC11 noted:

- The revised, combined models in Figure 1;
- Governance relied on the sharing of work across all partners and collaborative institutions; and
- Operations funds were required for maintenance costs and development costs.

116. FSC11 endorsed the proposed Collaborative Institutions namely IRD for the Tuna Atlas; and UW, SFP and FORTH for the GRSF; and thanked these institutions for their in-kind contributions and willingness to contribute to these global initiatives (**FSC11/D10.2**).

117. In addition, FSC11 noted that one MoU was envisaged in the short to medium term in which specified inputs for collaboration are provided as in-kind contribution. The structure of the MoU is being developed by the signatory Parties, FAO and CNR-ISTI. The annual work plan of the MoU is included as an annex which is planned to be reviewed by both Parties each year.

118. FSC11 noted that SLAs are developed by FAO in accordance to current core needs, and any future direction identified by FSC might necessitate revisions to SLAs and would have to be assessed in light of resources, which can be mobilized.

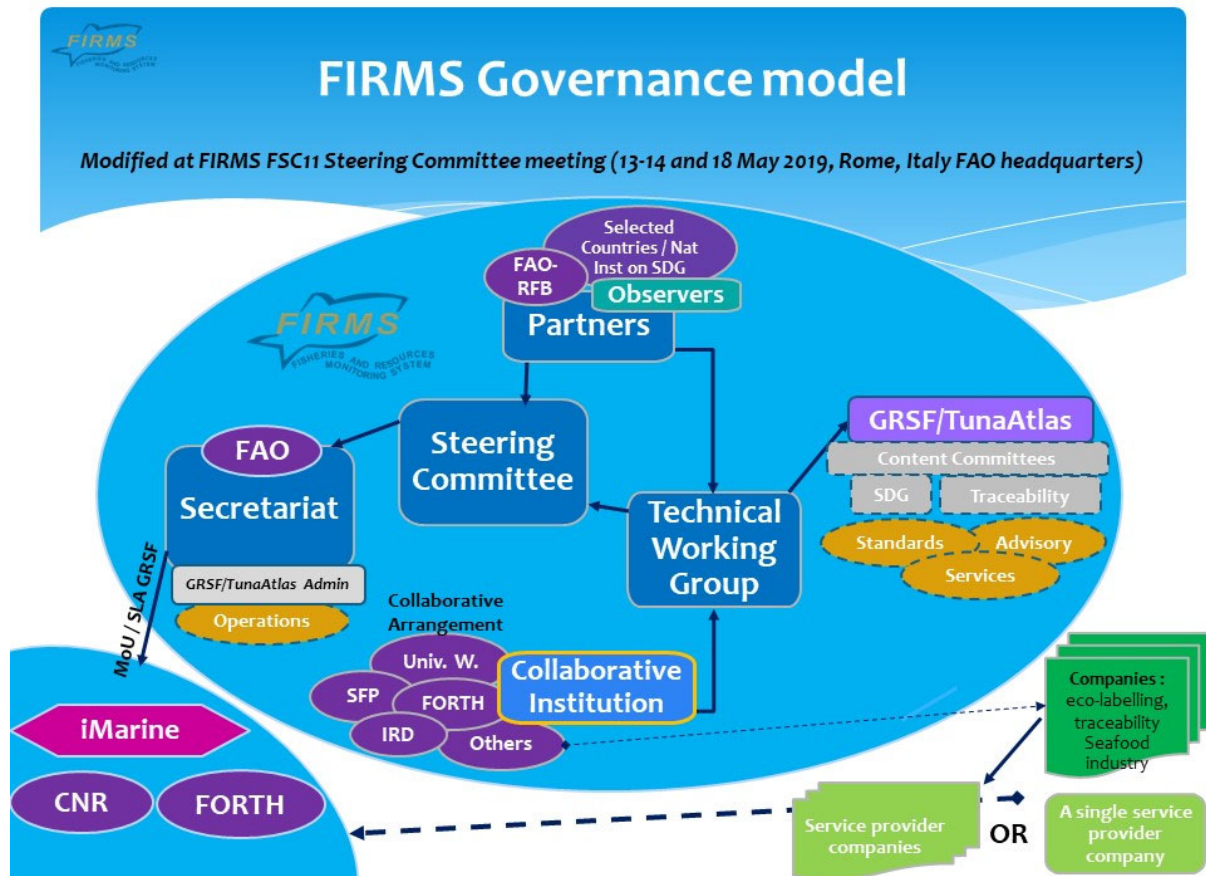


Figure 1: FIRMS Governance model for GRSF and Tuna Atlas

Figure 1 summarizes the main relations among the FIRMS governance components.

**FSC decides**

Strategic matters - e.g.

FSC10 - Value proposition

FSC11 – identify/validate collaborative institutions; validate priorities and work plans considering available resources

Orient distribution of effort among partners

Level involvement of FIRMS partners

Under which branding do we access services

Setting up of a new service, such as for Industry to request a UUID

Decide on information management options, as per advice provided by TWG, e.g.

Who can publish which type of IDs

Can we publish where a record doesn't meet the standard

Validation rules when more than one source report on same stock

Do we publish only validated Fishing units

**FIRMS TWG works on standards, services definition, and advice to FSC**

**FIRMS Secretariat operationalize with support of Collaborative Institutions**

## Citation standards

119. FSC11 noted and endorsed the citation standards including FAO policies and the use of DOIs.

## Envisaged resources

120. FSC11 noted that the work of the Secretariat and FIRMS as a whole will be increased with the GRSF and Tuna Atlas. In-kind contributions among Partners and Collaborative Institutions will constitute a key component of the required resources.

121. FSC11 also noted FAO's commitment to financially support with its Regular Program budget the system operations maintenance through SLAs for initial configuration. Depending on the evolution and specific demands for use by Partners, other sources of Partner budgets would be sought. Performance enhancements and new features would be funded through projects such as EU H2020 BlueCloud.

122. FSC11 noted the effort will have to remain commensurate with materialized resources.

## GRSF

123. FSC11 endorsed the GRSF value proposition (Annex 7) (**FSC11/D10.3**), noting that:

- Partners have committed to timely contributions of information;
- The Secretariat will communicate lists of stocks and fisheries with main descriptors and UUIDs to each partner for review and validation;
- Partners will ensure that the minimum requirements for GRSF (8 fields, refer below) are met according to data availability;
- Partners may wish to review their Members contributions to SDG by utilizing the Stock UUIDs.

124. FSC11 noted that data harvested from database sources (when available) and retrieved in GRSF records presently included:

- Abundance level (FIRMS Standard) (qualitative descriptor);
- Abundance level (quantitative/qualitative descriptor);
- Fishing pressure (FIRMS Standard) (qualitative descriptor);
- Fishing Pressure (quantitative/qualitative descriptor);
- FAO Stock Status Categories (qualitative descriptor);
- Biomass<sup>3</sup> (time series);
- Catches (time series);
- Landings (time series);
- Scientific advice (narrative); and
- Status and trend (narrative).

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<sup>3</sup> The RAM Legacy Database provides time series of the ratio of biomass to target biomass; the target may be either a MSY-based reference point or an explicitly stated target. If this ratio is available for total biomass (TB/TBmsy), that is provided preferentially, otherwise this ratio is provided in terms of spawning stock biomass (SSB/SSBmsy) if available. (Michael Melnychuk, Pers. Comm., 21 May 2019).

125. FSC11 noted the various FIRMS-GRSF integration options, including branding implications and the different user interfaces which can be offered (Annex 8).

126. FSC11 discussed the use of the FAO stock status categories and the FIRMS traffic light approach. That discussion is reported under Agenda item 9.

127. Mr Isara Chanrachkij (SEAFDEC) advised that SEAFDEC would discuss available data with its Members, and if possible submit these data during the inter-sessional.

128. FSC11 thanked Mr Chanrachkij for undertaking this important task.

129. FSC11 agreed that efforts by Partners to review and validate GRSF UUIDs would be reviewed by the eTGW inter-sessionally and arising issues and needs would be identified and discussed, with a view of holding a physical meeting during the first half of 2020 (**FSC11/D10.4**).

130. FSC11 agreed that the pilot GRSF could be released during suitable future events such as the FAO international symposium in November 2019 and/or COFI in 2020. The pilot GRSF release will be accompanied by a disclaimer for public users with explanations on the test nature of the product aiming to inform and to allow the utilization of the UUIDs so as to prove the value of the GRSF to relevant stakeholders (**FSC11/D10.5**).

131. In addition to the testing, review and validation of the UUIDs, the Secretariat would need to complete the technical work on the GRSF system.

132. FSC11 agreed that information on the GRSF could be broadly disseminated through Partners and their membership, as well as Collaborative Institutions. To this end, FSC11 requested that the Secretariat and interested Partners prepare appropriate material to communicate this important development (**FSC11/D10.6**).

## **Tuna Atlas**

133. FSC11 endorsed the actions required for the work on the Tuna Atlas (**FSC11/D10.7**), noting that:

- IOTC, ICCAT and IATTC (by correspondence) expressed their commitment for implementation of the CWP-26 endorsed reference harmonization standard for Catch, and Catch and Effort.
- The submission of Level 0 data compliant with CWP standards should be done as far as possible at the same time each year, and the timing of the submissions would be determined by the t-RFMOs involved in the process (e.g. start of each year).
- Scenario 2 was adopted, with FAO as the co-custodian of the Level 0 dataset.
- Partners would be informed when the iMarine MoU is signed.
- The responsibilities for the production of datasets and their dissemination through the FIRMS Tuna Atlas would be reviewed by a TWG.
- The official release of the FIRMS Tuna Atlas map viewer would be decided after data processing rules and content validation by TWG.

- Further expansion of the Atlas may be done under BlueCLOUD (refer to item 8).
- Medium term envisaged in this work plan spans a period of at least 3 years.

## **11. INTER-SESSIONAL WORK PLAN (AGENDA ITEM 11)**

134. In a round-the-table discussion, individual Partners reiterated their commitment to timely updates of FIRMS information and the review and validation of stock UUIDs and associated requirements. Partners also agreed to disseminate information about FIRMS, GRSF and the Tuna Atlas within their membership, including the possible utilization of the communication material prepared for the GRSF.

135. Partners also recognized the benefits of FIRMS standards in facilitating data exchanges, and agreed to promote FIRMS including linking FIRMS from their websites and/or embedding the FIRMS map viewers or fact sheets in their websites.

136. FSC11 noted:

- the request by some partners (e.g. FCWC, CECAF, SWIOFC, SEAFDEC) for capacity building and assistance in implementing FIRMS procedures and standards;
- some Partners may soon contribute data on small-scale fisheries; and
- IOTC was considering including blue shark in its Annex 2.

137. FSC11 recognized the major ongoing contribution and support provided by the FIRMS Secretariat.

138. FSC11 agreed the following general points in relation to the Partnership (refer also paragraph 22):

- Further work on outreach for prospective new partners, including raising the FIRMS profile at meetings, increasing visibility of benefits; and
- Encouraging t-RFMOs to discuss FIRMS with WCPFC and SPC.

139. FSC11 agreed the following tasks associated with its core business:

- A general data call once at the beginning of the year complemented with tailored timing of data call with each individual partner; calendar will be agreed with each partner (paragraph 57);
- Follow-up on pending definitions for descriptors and controlled terms reported in the IMP;
- Finalisation and publication of the collaborative arrangements and rules of procedures;
- Consider including in annual Partner activity reports information on the geographic coverage reported relative to the total number of stocks and fisheries in a given area, as well as what percentage of the global catch is reported to FIRMS (paragraph 56); and
- Consider improving the compatibility of FIRMS website for mobile devices (paragraph 58).

140. FSC11 encouraged Partners to consider how to improve the FIRMS synthesis of stock status information while ensuring the minimum data requirement approach is fully met.

141. FSC11 agreed the following tasks associated with GRSF:

- Review and validation of descriptors Biological Stock, Assessment Unit, and Management Unit for all stocks of each partner together with the provision of the stocks and fishery UUIDs;
- Public release of the GRSF pilot in September - November 2019; and
- Prepare communication material on GRSF.

142. FSC11 agreed to follow-up on all of the tasks identified regarding the Tuna Atlas.

143. FSC11 noted the need for developing a standard and database for local Management areas, and that SFP has interest to progress this matter.

144. FSC11 decisions (tagged FSC11/D0.0) are detailed in the report and are summarised as follows:

- **FSC11/D9.1** TWG to review the use of the coloured lights as a stock status indicators (paragraph 107).
- **FSC11/D9.2** TWG to review definitions related to jurisdictional areas (paragraphs 108 and 109).
- **FSC11/D9.3** Secretariat to include agreed definitions in IMP standards (paragraph 110 and Annex 6).
- **FSC11/D10.1** FSC endorsed the Collaborative Arrangement (with a termination period to 6 months) and related amendments of the Rules of Procedure (paragraph 113).
- **FSC11/D10.2** FSC endorsed the proposed Collaborative Institutions (paragraph 116).
- **FSC11/D10.3** FSC endorsed the GRSF value proposition and agreed to associated actions (paragraph 123 and Annex 7).
- **FSC11/D10.4** TWG to review Partners' steps to review and validate GRSF UUIDs, and consider holding a physical meeting during the first half of 2020 (paragraph 129).
- **FSC11/D10.5** FSC agreed to publicly launch the pilot GRSF during suitable future events, noting associated tasks (paragraph 86, 130, 147).
- **FSC11/D10.6** FSC agreed to broadly disseminate information on the GRSF (paragraph 132).
- **FSC11/D10.7** FSC endorsed the work on the Tuna Atlas (paragraph 133).
- **FSC11/D12.1** FSC agreed to hold its next meeting in June 2021 (paragraph 145).
- **FSC11/D13.1** The Secretariat agreed to consider that the GRSF pilot be presented during the COFI meeting in 2020 (paragraph 148).
- **FSC11/D14.1** FSC requested nominations for the vice-chairperson position (paragraph 151).

## **12. PLANNING FOR THE NEXT SESSION OF FSC (FSC12) (AGENDA ITEM 12)**

145. FSC agreed to hold its next meeting (FSC12) in June 2021 (**FSC11/D12.1**), and thanked NEAFC for offering to host that meeting and IOTC for considering the possibility of being the backup host, if needed.

146. FSC considered options for the adoption of the meeting reports and the requirements to run the FSC and CWP meetings back to back. This practice resulted, for example, in the report of FSC11 being adopted at the conclusion of the CWP meeting, some 3 days after the close of the substantive part of the FSC meeting. Other options for adopting the FSC report include adoption in a timelier manner, or by correspondence.

## **13. ANY OTHER BUSINESS (AGENDA ITEM 13)**

147. Mr Campbell proposed that the GRSF pilot be presented during the COFI meeting in 2020. This would provide a broader audience as well as promoting GRSF to countries and policy makers. COFI provides a greater outreach than available at RSN meetings.

148. The Secretariat agreed to consider this matter and the possibility of holding a side event at COFI (**FSC11/D13.1**).

149. FSC11 noted that the new Partners' signing ceremony (paragraph 15) was reported on social media (Flickr, Twitter and LinkedIn).

## **14. ELECTION OF CHAIRPERSON AND VICE-CHAIRPERSON (AGENDA ITEM 14)**

150. FSC11 noted that Ms Cummings' term as Chairperson will end at the close of the meeting, and sought nominations for a new Chairperson. There were no nominations proposed. Ms Cummings indicated her availability of acting as Chairperson for another term if that was of interest to FSC. FSC11 thanked Ms Cummings for being Chairperson since 2016, and her willingness to stand for another term, and unanimously endorsed her as Chairperson for another term.

151. FSC also sought nominations for vice-chairperson and task leaders for GRSF and the Tuna Atlas. Ms Cummings and Mr Fiorellato were unanimously endorsed as task leaders for GRSF and the Tuna Atlas, respectively. FSC11 agreed to hold the vice-chairperson position open until the end of the meeting, or if required to the inter-sessional until the position can be filled (**FSC11/D14.1**).

## **15. ADOPTION OF THE REPORT AND CLOSE OF SESSION (AGENDA ITEM 15)**

152. The report was adopted on 18 May 2019.

153. In closing the meeting, Ms Cummings and Mr Taconet thanked all colleagues for the rewarding discussions and sharing of a common understanding about FIRMS and its future directions. They also thanked the new Partners for their contributions at the meeting and participation in the signing ceremony. Prospective Partners and Collaborative Institutions were also thanked for their participation. Mr Taconet finally thanked the FIAS team for their ongoing commitment to supporting FIRMS.

154. The participants expressed their thanks to the Chairperson, FAO for its hospitality, and the FIRMS Secretariat for a well-resourced meeting.

155. The meeting was closed at 10.04 hours.



# Annex 1

## Meeting agenda

**Day 1, Monday 13-05-2019**

All day: 9:00 hours to 17:30 hours

### 1. Opening session and Welcome address

*FI Senior management will welcome and introduce the FIRMS expansion theme for FSC11.*

### 2. Adoption of agenda

### 3. FIRMS Membership – expanding the Partnership

#### a) Perspective new FIRMS partners

- In the FIRMS endorsement/signature pipeline: FCWC, SPRFMO
- Invited: CPPS, CTMFM, NAMMCO, NPFC, SIOFA, WCPFC

#### b) Collaborative Arrangement for FIRMS “Collaborative institutions”

(Doc. FIRMS FSC11/2019/4)

*As FSC10 follow-up, a new way to join FIRMS with a lighter arrangement for a category of partners with no full rights and responsibilities. The Rules of Procedures may also need to be reviewed by FSC11 in light of such possible expansion.*

#### c) Perspective new FIRMS Collaborative Institutions

- In the FIRMS endorsement pipeline: FORTH, IRD, SFP, UW

### 4. Annex 2- Review of proposed modifications of existing partners

*Annex 2 outlines Partner contributions to FIRMS under their Partnership Arrangement; Partners are invited to submit any proposed modification to their Annex 2 for consideration by FSC11.*

### 5. Review of FIRMS activities during the intersession

#### a) Report on intersession activities

(Doc. FIRMS FSC11/2019/2)

### 6. Report of Technical Working Group 6

#### a) Reports of TWG6 and e-TWG 6.1, 6.2.

(Doc. FIRMS FSC11/2019/3)

*TWG recommendations for final endorsement by FSC11.*

### FIRMS Governance leadership on the Global Record of Stocks and Fisheries (GRSF)

(Doc. FIRMS FSC11/2019/5)

*FSC10 decided that the Partnership should work towards taking the ownership of GRSF a new iMarine tool developed under the BlueBRIDGE project to provide unique identifiers for a more comprehensive stock status data coverage, support traceability, and strengthen SDG indicator reporting, which can help to achieve FIRMS goal: “facilitate the monitoring of the status and trends of all fishery resources”. See FSC10 report at [www.fao.org/3/a-bs239e.pdf](http://www.fao.org/3/a-bs239e.pdf)*

#### a) Why GRSF

#### b) Status of development and pilot release

#### c) Governance and business model recommended by FSC10/TWG6 and follow-up

- Governance structure
  - Mechanisms for collaborative institutions and technical suppliers
- These include reference to collaborative arrangements and introduction of MoUs, SLAs*

- d) Future perspectives and proposed workplan
- e) General discussion and statement on possible FIRMS Governance Leadership on GRSF

### **Day 2, Tuesday 14-05-2019**

All day: 9:00 hours to 17:30 hours

## **7. FIRMS Governance leadership on the Global Record of Stocks and Fisheries (GRSF) (cont.)**

### **7. FIRMS Governance leadership on the Tuna Atlas** (Doc. FIRMS FSC11/2019/6)

*This new iMarine tool developed under the BlueBRIDGE project was reviewed during the Tuna sub-group of CWP-WG on Reference Harmonization (Rome, March 2018), which recommended that this Global Tuna Atlas initiative be operating and governed under the FIRMS umbrella. See report at [www.fao.org/3/CA3132EN/ca3132en.pdf](http://www.fao.org/3/CA3132EN/ca3132en.pdf)*

- a) Why a FIRMS Tuna Atlas
- b) Status of development
- c) Review Recommendations of Tuna sub-group of CWP-WG on Reference Harmonization
- d) Governance and business model recommended
- e) Future perspectives and proposed workplan
- f) General discussion and statement on possible FIRMS Governance Leadership on Tuna Atlas

## **8. FIRMS protocol and standards**

- a) FIRMS Information Management Policy (IMP) – FSC10 version (Doc. FIRMS FSC11/2019/14)  
*Final adoption of FIRMS controlled terms and updated definitions (i.e. “Biological stock”, “Assessment unit”, “Jurisdictional distribution”, “Spatial scale”, “Management Unit”)*
- b) Addition of new FAO stock status categories and mapping.  
*Overfished, Maximally sustainably fished, and Underfished are the three FAO categories to classify the status of fishery resources (SOFIA, 2018).*

## **9. Revised FIRMS Governance structure**

*As result of the discussions, the FSC11 is requested to summarize and deliberate on a suitable governance structure to enable the FIRMS expansion.*

- a) *Adoption of the collaborative arrangement instrument*
- b) *Validation of amended Rules of Procedure*
- c) *Concluding statements on governance leadership for the GRSF and the Tuna Atlas*

## **10. Intersessional work plan**

*Partners are invited to express their expected benefits for their contribution and participation to FIRMS, which will be considered for planning the activities*

**11. Planning for the next session of FSC (FSC12)**

**12. Any other business**

**13. Election of Chairperson and Vice-Chairperson**

**Day 3, Saturday 18-05-2019**

Morning: 9:00 hours to 10:00 hours

**14. Adoption of the Report and Close of Session**

## **Annex 2**

### **List of participants**

#### **FIRMS Members**

##### **Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)**

Mr Tim JONES  
Data and Information Systems Manager  
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##### **Fishery Committee for the West Central Gulf of Guinea (FCWC)**

Mr Séraphin Nadjé DEDI  
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##### **Food and Agriculture Organization of the United Nation, Fisheries and Aquaculture Department (FAO-FI)**

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##### **General Fisheries Commission for the Mediterranean (GFCM)**

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##### **International Commission for the Conservation of Atlantic Tunas (ICCAT)**

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**International Council for the Exploration of the Sea (ICES)**

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**Indian Ocean Tuna Commission (IOTC)**

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**North-East Atlantic Fisheries Commission (NEAFC)**

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Ms Saivason KLINSUKHON  
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**South Pacific Regional Fisheries Management Organizations (SPRFMO)**

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**FIRMS Associated Members**

**Fishery Committee for the Eastern Central Atlantic (CECAF)**

Mr Carlos Alberto MONTEIRO  
Chair of the Scientific Sub-Committee (CECAF SSC)  
Biologiste de pêche  
Institut National de Développement de la Pêche  
Repub. Cabo Verde

**Southwest Indian Ocean Fisheries Commission (SWIOFC)**

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**Western Central Atlantic Fishery Commission (WECAFC)**

Ms Nancie CUMMINGS  
FIRMS Chairperson  
WECAFC regional focal point for FIRMS  
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### **Collaborative Institutions**

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### **Observers**

#### **Marine Resources Council (MSC)**

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### **Rapporteur**

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### **FAO attendees**

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Fishery Officer (iMarine)  
BlueBRIDGE – Blue Assessment Work Package leader  
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Mr Aymen CHAREF  
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**Remote attendance**

**Foundation for Research and Technology - Hellas (FORTH)**

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**Northwest Atlantic Fisheries Organization (NAFO)**

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**University of Washington - RAM Legacy Stock Assessment Database**

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**Annex 3**  
**Opening of the Meeting**  
**Speech by Ms. Vera Agostini Deputy Director, FIA**  
(13 May 2019)

Welcome to Rome and thank you for making yourself available for this very important meeting.

The Fisheries and Resources Monitoring System (FIRMS) provides a wide range of users around the world free and easy access to a wide range of valuable information and data on global fisheries including resource status, management practices and monitoring initiatives. Therefore, we can proudly say that FIRMS' service to the world fisheries great enhance availability of fishery information and transparency of fishery management, which subsequently contribute to the sustainable development of world fisheries as required by the United Nations Sustainable Development Goals, especially SDG 14.

This is a FIRMS' Steering Committee meeting. As the name suggests this meeting is to steer FIRMS' work or even future directions over next few years. Therefore, you have important jobs to do at this meeting and your contribution will be highly valued.

As you probably know, FAO is going to have an International Symposium in November this year on fisheries sustainability. The symposium consists of 8 sessions, of which two are particularly relevant to this meeting:

- Session 1 – The status of global and regional fisheries sustainability and their implications for policy and management
- Session 7 – Fisheries information systems and new technologies.

This symposium should constitute a decisive milestone for FAO to take a strong leadership in the next 10 to 20 years for global sustainable fisheries.

As a monitoring system collating and disseminating to world users authoritative information on the status of stocks and fisheries, FIRMS is very relevant to the questions and themes of the symposium. A strong partnership leveraging the comparative advantages of FAO, RFBs and selected national institutions and NGOs, benefiting of IT innovations, and building on the SDG momentum, can constitute a precious instrument for assuring this leadership.

Our vision to provide a highly visible and used digital online resource (web-based), which can be an evidence-base to support global or regional statements on status of stocks. We see it as a digital companion of SOFIA's stocks status, which will provide the requested transparency to world users and rely on a higher granularity as integrating the SDG14.4.1 national reporting. As a digital resource disseminating unique identifiers of stocks and fisheries, another unique prospect will be to draw the connection between stock status, catch data, and trade information.

I understand that FIRMS current agenda is in expansion of the partnership, with two additional RFBs and (an innovation in FIRMS) four collaborative partners. The coverage now reaches 21 Regional Fisheries Bodies (RFBs) with few others likely to join.

With your expertise and contribution, I believe this workshop will be crucial to guide us on the process of quantifying, and eventually achieving, global fisheries sustainability.

Thank you for participation in the workshop. And make sure you have some time to enjoy the beauty of this 22 centuries old city.  
I wish you a great success.

**Annex 4**  
**Introducing the FCWC - FIRMS Partnership**  
**Speech by Mr Seraphin Dedi Nadjé, Secretary-General,**  
**Fisheries Committee for the West Central Gulf of Guinea (FCWC)**  
(13 May 2019)

Distinguished Guests, Colleagues, Ladies, and Gentlemen,

It is my pleasure to deliver a speech on this important occasion of the signature of the Partnership Arrangement between The FCWC and The FIRMS, to mark the long-lasting collaboration between FAO, FIRMS and FCWC Secretariats.

At this point, let me express my sincere gratitude to the FIRMS Secretariat, all members of FIRMS and my appreciation to the FAO, the depositary of the FCWC Convention of Establishment for their continued support.

In particular, I wish to express my regards to the Guest of Honour, the FAO Deputy Director-General, ARNI Mathiesen, who has raised this occasion with his presence here today.

The Fisheries Committee for the West Central Gulf of Guinea (FCWC) was established in 2007 to facilitate cooperation in fisheries management between its member countries: Liberia, Côte d'Ivoire, Ghana, Togo, Benin, and Nigeria. The countries have several shared fish stocks and identified a need for cooperation and guidance in the management of these resources.

However the absence of reliable fisheries data/information is hindering government's ability to effectively plan interventions for the sector. This is further hampering sustainable exploitation and management of fisheries with the overall consequence of declining fisheries resources, degradation of fisheries-based livelihoods, increasing poverty and a general decline in the contribution of the sector to overall country GDP growth. The lack of reliable fisheries statistical data and information is an obstacle to effective decision making on marketing, investment and the sustainable management and exploitation of fisheries resources.

In 2017, the six FCWC member countries (Benin, Côte d'Ivoire, Ghana, Liberia, Nigeria, and Togo) benefited from the FAO TCP project RAF/TCP/3512 and made a serious attempt to harmonize data collection systems by improving or introducing an updated fisheries data collection system, using the so-called Open

ARTFISH software. FCWC member states are now in the process of collecting, compiling and disseminating the list of core fisheries indicators.

FCWC wants to preserve this significant progress made and continue to promote the development of standards for the collection, exchange, and reporting of fisheries data. In particular and under this FIRMS-FCWC agreement, FCWC will coordinate the countries' submission of fishery information. National inventories of fisheries including relevant fishing activities, production systems, and fisheries management will be structured for uploading and maintained in FIRMS.

Through the FCWC-FIRMS partnership, we hope to secure a return on our effort and investment for FCWC member countries participating in the FIRMS framework including:

- improved visibility at the global level;
- clear participation and support for countries contribution to political programs, such as the Pan-African Strategy on the Improvement of Fisheries and Aquaculture Data Collection, Analysis and Dissemination and the United Nations Sustainable Development Goals (SDG);
- benefit from the availability of FIRMS data services in support of monitoring the status of stocks and fisheries in West Africa;
- and to make this partnership a catalyst for funding opportunities for strengthening capabilities.

Before concluding, I once again wish to express our sincere gratitude to FIRMS members for your positive response to our request to become a member of FIRMS,

My gratitude also to the Deputy Director-General, Mr ARNI Mathiesen, Fisheries and Aquaculture Department, for his presence and support.

Thank You All Very Much.

**Annex 5**  
**Introducing the SPRFMO – FIRMS Partnership**  
**Speech by Mr Craig Loveridge, Data Manager,**  
**South Pacific Regional Fisheries Management Organizations**  
**(SPRFMO)**  
(13 May 2019)

Dear Chairperson, delegates, representatives and colleagues,

It is my pleasure to be able to thank the current FIRMS partners for welcoming and endorsing SPRFMO as a full partner. I also wish to acknowledge and thank FAO, as the FIRMS Secretariat, for facilitating the entire process.

My name is Craig Loveridge, and for those of you that do not know me, I am the Data Manager for the South Pacific Regional Fisheries Management Organizations – or SPRFMO as the locals call it.

SPRFMO began in 2006 when Australia, Chile and New Zealand initiated a process of international consultations and in November 2009, the Convention on the Conservation and Management of High Seas Resources of the South Pacific Ocean was adopted. Relatively quickly, on 24 August 2012, the Convention entered into force establishing the SPRFMO.

The SPRFMO consists of a Commission, which meets annually and is hosted by different members each year. The Commission has 15 Members from Asia, Europe, the Americas and Oceania. In addition, there are 4 Cooperation non-Contracting Parties and I will not go into details as much of this information is freely available on the organizations' website. There are currently 3 subsidiary bodies dealing with Science, Compliance and Financing as well as a compact Secretariat.

The Secretariat is based in Wellington and was the first international organizations to be headquartered in New Zealand. Dr Sebastián Rodríguez Alfaro is the current Executive Secretary and he manages 6 staff, including myself, and we have an active internship programme.

SPRFMO manages the High seas non-tuna Fisheries in the South Pacific Ocean. An area roughly 20% of all of the world's high seas areas. Currently, the main commercial resources fished in the SPRFMO Area are Jack mackerel and jumbo flying squid in the Southeast Pacific and Orange roughy and other deep-sea species in the Southwest Pacific. In addition, we currently have exploratory potting and toothfish fisheries.

One of SPRFMO aims is to ensure there is controlled dissemination of high quality and updated information for its fisheries and resources. This aim is shared by FIRMS and indeed the FIRMS arrangement aims to promote the development and extension of fisheries status and trend reporting amongst all fisheries resources.

By joining with FIRMS we are expecting to benefit by receiving:

- access to high quality information for the enhancement of regional fisheries management;
- further ensuring our regional efforts are visible at the global level and influence global policy;
- improving the transparency, accuracy and cross-compatibility of our information;
- leveraging on the information reported to FIRMS for our own processes; and
- use of FIRMS data services, access to FIRMS editorial tools as well as sharable information and relevant services provided by FAO as the Secretariat.

In turn we intend to contribute to the FIRMS partnership by:

- making information on our fisheries available through the various FIRMS data services toolset in a timely manner;
- contributing to regional data sharing needs, such as building foundation information layers (inventories, fact sheets) that act as catalyst to develop/enhance regional databases;
- facilitating global policy processes by standardising stocks and fisheries inventories;
- actively participating in the overall development of the FIRMS partnership, database structure, content and access policies; and
- bringing our ideas and experiences to the table and listening to and supporting the ideas and aspirations of others.

SPRFMO entering into this partnership did not come about by chance; SPRFMO has been an observer to the FIRMS partnership for some 3-4 years. Thus, a proposal to join FIRMS was welcomed by the SPRFMO Scientific Committee in 2018 and that resulted in a recommendation to join FIRMS, which the Commission considered early this year. It was notable that there was also FAO representation at our Commission meeting, which further strengthened the proposal and was no doubt instrumental in the Commission's Decision to agree with entering into a full partnership arrangement.

Ladies and Gentlemen, it is an honour to be here representing SPRFMO and we look forward to building and maintaining good working relations between SPRFMO and among all the FIRMS partners.

I'm looking forward to a productive week and thank you all very much for your attention.

## **Annex 6**

### **FIRMS FSC11 Approved standards and definitions**

#### **Biological stock**

“A subpopulation of a species inhabiting a particular geographic area, having similar biological characteristics (e.g. growth, reproduction, mortality) and negligible genetic mixing with other adjacent subpopulations of the same species.”

#### **Assessment unit**

“A group of individuals of one (or more) species that is the object of a stock assessment and/or any other analysis aiming to investigate stock status. The assessment unit is ideally consistent with the biological stock extent, but can be established on another basis according to the purpose of assessment and the nature of the fishery concerned.”

Note: Beyond the assessment focus, an Assessment Unit can be considered a Management unit (i.e. delineated within a management jurisdiction such as country's EEZ or RFMO's area of competence) on the basis of practical/political convenience, including for implementation of management measures.

#### **Management unit**

“The area where the fish was caught and which is targeted by a unique set of measures. This unit (i.e. one - or more - species in a particular area) has generally been defined at regional, national or local scale by a management authority including through stakeholder consultation.”

Note: Management units may be used for setting the basis for stock status determination, and may not correspond to the biological stock.

Controlled terms for the descriptor “**Jurisdictional distribution**” were revised and it was decided that the controlled terms “**Highly migratory**” and “**Straddling between high seas and EEZ**” are to be kept separate with updated definitions.

#### **Highly migratory**

“Marine Resource capable of migrating relatively long distances, which is likely to occur both within EEZs and high seas. These are technically straddling stocks, but given their peculiar characteristics they are often managed by specific management bodies, and are here kept as a separate category.”

#### **Straddling between high seas and EEZ**

“Marine Resource whose distribution overlaps EEZ(s) and areas beyond national Jurisdiction”.

#### **Spatial scale**

“Geographic level/resolution at which the Marine Resource or Fishery is being reported in FIRMS”.

## **Annex 7**

### **GRSF value proposition**

#### **Stocks - towards global coverage**

- Achieving a critical mass of records on identified Assessment units
- Digital Companion to SOFIA and SDG14.4.1 summary reporting:
  - the architecture of these indicators
  - access to fine grained evidence of stocks and their status

#### **Fishing units – standard identifiers available for inclusion in traceability schemes for use as connectors to scientific info on fisheries and exploited stocks**

- Incentive for fisheries sustainability

#### **A unique resource with high potential for use and visibility**

- Identifiers built on international standards
- Connecting Catches, Stock Status, and Trade information



## **Annex 8**

### **FIRMS-GRSF integration option**

#### **Current GRSF catalog**

- Can be branded as FIRMS, or remain distinct branding
- To be understood as user interface for advanced users

#### **FAO/FIRMS custodian of Unique Identifiers**

- UUIDs are disseminated with the FIRMS branding
  - FIRMS map viewer
  - FIRMS search interface
  - FIRMS data services (list of competency queries)
- UUIDs link to the source information and related branding

#### **FAO/FIRMS custodian of GRSF minimum information**

**Annex 9**  
**FIRMS FSC11 group photograph**



**Annex 10**  
**FIRMS FSC11 signing of new partners (FCWC and SPRFMO) photograph**

