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The Fishery Resources Monitoring System¹ (FIRMS) and its application in the RECOFI area.

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1. FIRMS is a formal Information Partnership arrangement launched in February 2004 which currently brings together 13 International Organizations. FIRMS's objective is to provide information users with a better means to monitor the status and trends of world fishery resources and their management, based on authoritative information sources. Although part of FIRMS original vision, national institutions are not yet members of the Partnership which so far only includes regional fishery organizations and other inter-governmental organizations. More information on FIRMS is provided in Annex 1.

2. When FAO Fisheries Department became a FIRMS Partner in 2004, RECOFI as a FAO body (together with other FAO regional bodies) became de facto a part of FIRMS and a potential data owner. This 6th RECOFI Commission meeting is the first opportunity to introduce FIRMS to RECOFI member countries.

3. This document intends to provide a brief review of FIRMS and its status, recent developments and current initiatives, puts forward the benefits which RECOFI might expect from contributing status and trends reports to FIRMS, and proposes and way forward.

1 Status of FIRMS, recent developments and benefits to contributors

4. FIRMS aims to provide its users/clients with an integrated web-based system for monitoring the status and trends of world fishery resources and their management, using authoritative sources of information. FIRMS is built on an extensive database of fishery information and interrelated modules which may be viewed using web-based tools and reports. The development of FIRMS is guided by a Steering Committee (FSC) which is formed by the partners.

¹ <http://firms.fao.org/firms/en>

1.1 FIRMS Tools:

5. The first priority defined by the original Partners was to develop the Marine resources module, which now contains about 1000 fishery stocks, of which 40% have information available on status and trends. Reports are presented in the form of structured fact sheets presenting overviews on the state of stocks, with links to the underlying references for further details. The FIRMS partnership endorsed in 2008 a standard terminology for stocks state descriptors based on two dimensions - Exploitation rate and Abundance level- which has been subsequently used to index all stocks for which status information was available (Figure 5). The “Status and Trends Summaries” facility² was subsequently released allowing users to search the FIRMS data base by status descriptor, species and areas, with possibility to download the search results in Excel. Web trends statistics tell that this summary facility is the most used feature in FIRMS.

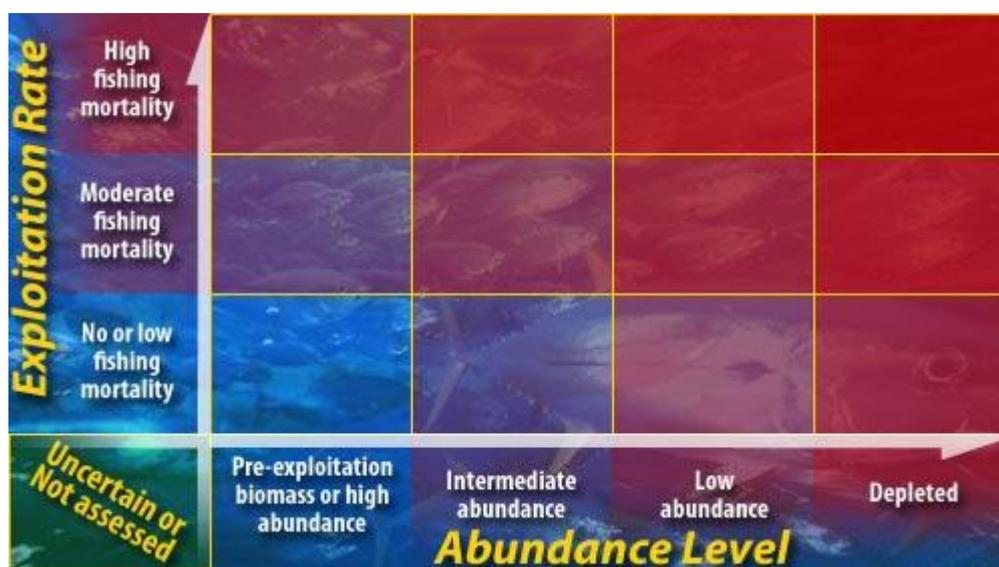


Figure 5: two dimensional Stock state descriptors

6. A Fisheries Module has been released in August 2009 in order to respond to the needs of those Partners focusing their monitoring on either Fishing activity (Métiers or Operational units), Management actions (Fishery management units), or Socio-economic performance (Fleet segments). This module is particularly well adapted to small scale fisheries information reporting needs. The following fact sheets are example of these fishery fact sheets:

From CCAMLR, a Fishery management unit perspective:

- Southern Ocean Toothfish fishery - Eastern Ross Sea (Subarea 88.1), 2008
<http://firms.fao.org/firms/fishery/345>

From CECAF, a Métier / Operational unit perspective ...

... as a result of an Excel inventory workflow:

- Guinée Artisanal set gillnet fishery (large and very large mesh size), 2009:
<http://firms.fao.org/firms/fishery/510/fr>

... as a result of a Word inventory workflow:

² see <http://firms.fao.org/firms/summaries/en>

→ Eastern Central Atlantic Spanish bottom wet fish trawler black hake fishery – Morocco South Zone (B and C), 2009: <http://firms.fao.org/firms/fishery/497/en>

From BigNumbers Study

→ Senegal artisanal fisheries sub-sector, 2008: <http://firms.fao.org/firms/fishery/473/en>

1.2 National level reporting:

7. Although the Partnership is not open to National partners, FSC6 confirmed that national level reporting can be channelled and encouraged through relevant FIRMS RFB members. These national level contributions are accepted provided some peer review process and quality assurance rules are applied through RFB level mechanisms such as a Scientific Committee. Such process has already been enshrined in CECAF, GFCM, SWIOFC and SEAFDEC. Therefore there is scope for RFBs to combine national level reporting required as part of the regional mechanisms, and FIRMS reporting.

1.3 Benefits for RECOFI and its member countries of reporting to FIRMS

At a political level:

8. FAO member countries through COFI, and UN members through the UN General Assembly, have made commitments to the Strategy-STF³ and their willingness to adhere to principles of good fisheries governance based on the best scientific knowledge available. Reporting status and trends of resources and fisheries demonstrates countries' compliance with such commitment, and FIRMS offers an enabling framework.

9. As well, the 2006 UN Review Conference on Straddling and highly migratory Fish Stocks recommended that States individually or collectively through RFMOs should cooperate with FAO in the implementation and further development of the Fisheries Resources Monitoring System (par. 18j)"

At a strategic level:

10. FIRMS partners have understood the benefits of FIRMS reporting mechanisms:

- The FIRMS fact sheets primarily serve data owners needs. FIRMS offers a technology which enables the Partner to “recycle” in its own website the fact sheets which it contributed to FIRMS. GFCM⁴ has already implemented this facility and others are following.

11. Additionally, Fact sheets are communication products which:

- provide overviews and contribute to convey the essential information for fishery management or policy making; full details are accessible through link to electronic sources;
- allow better searchability on the internet including through full text and controlled terms; a presence in FIRMS increases the profile of RFB reports, as well as the visibility of their work on the internet;

³ FAO Strategy-STF: FAO strategy for improving information on status and trends of capture fisheries

⁴ see <http://www.gfcm.org/gfcm/topic/17104/en>

- can be merged and enriched with other sources of information such as catch statistics, or multidisciplinary maps;
- constitute a dynamic reporting featuring ability to maintain time series of reports as information becomes available;
- enable the development of new products, such as maps, statistics, or synoptic views (eg Status and Trends summaries)

2 Proposed actions in the RECOFI area

12. By applying the FIRMS framework in the RECOFI region, it is proposed to boost member countries capacity to report on the status of resources and fisheries as per their UN commitment to good fisheries governance. The aim will be to formalize an inventory of Marine resources/stocks and Fisheries across the whole RECOFI area, at a regional and national scale, for its eventual publishing through the Fishery Resources Monitoring System (FIRMS). This inventory will be used as backbone for regular reporting of status and trends of stocks and fisheries under RECOFI mandate, using web-based framework and approaches established by FIRMS.

13. Towards this goal, an ad'hoc workshop would be organized in July 2011 in Cairo (Egypt). The workshop will build on past work conducted both by the FIRMS Secretariat and RECOFI: in 2004, draft inventories of marine resources and fisheries in the RECOFI area have been developed for the FIRMS Secretariat by an expert of the RECOFI region. In late 2010, this work has been updated by comparing and integrating the country reports that have been produced during the Fourth meeting of the RECOFI Working Group on Fisheries Management. Prior to the workshop, these updated inventories would be dispatched to the National focal points together with supporting guidelines, who would be requested to activate the relevant mechanisms for validation at national level. The nationally validated inventories would then be presented during the workshop, which would further work on its regional consolidation. The workshop results would then be presented at the next RECOFI Scientific Committee for its consideration in terms of formal endorsement and eligibility for publishing on internet through FIRMS website.

Annex 1: What is the Fishery Resources Monitoring System (FIRMS)

FIRMS is a formal Information Partnership arrangement launched in Feb. 2004 which currently brings together 13 International Organizations (see members map in annex 1). FIRMS's objective is to provide information users with a better means to monitor the status and trends of world fishery resources and their management, based on authoritative information sources. Being a formal arrangement, partners make commitments for the provision of information and the governance of the system assured by the FIRMS Steering Committee (FSC). FAO provides the FIRMS Secretariat.

During the developmental phase, the partnership has been limited to regional fishery organizations and other inter-governmental organizations. However FIRMS's long-term vision is to include national institutions in its partnership. The main driver to this expansion lies in FIRMS aspiration to be a global monitoring system, implying that it should be able to cover resources and fisheries within national jurisdictions and in areas where regional fishery bodies do not exist. However,

The FIRMS website <http://firms.fao.org> is the visible outcome of the FIRMS information sharing work. This website was launched in May 2006 during a side event of the UN Review Conference on Straddling and Highly Migratory Fish Stocks. Currently, FIRMS disseminates through its Marine resource module information for about 1000 stock units. This module hosts scientific knowledge about the biotic component of the fishery system: structure of marine resources populations, habitat and biology of concerned organisms, stock units, stock assessments, resources status and trends. The FIRMS web based system is powered by the Fisheries Global Information System (FIGIS) and benefits from its content management system and information exchange protocol features.

Progressively elaborated by the FSC, an Information Management Policy (IMP) defines the principles and conditions governing the sharing of information contributed by the various Partners within FIRMS, including quality assurance issues, data ownership, dissemination rules, streamlined workflow mechanisms, information standards. FIRMS information sharing mechanisms are in particular based on two fundamental tools:

- the inventories constitute the backbone of the FIRMS system. Each partner enumerates the list of Resources and Fisheries under its monitoring and/or management mandate, and the system organizes the reporting on status and trends according to these lists and related data ownership;

The system displays all inventoried units, also when information is not sufficient to provide a fact sheet; the absence of fact sheet provides an indication of potential knowledge and monitoring gaps.

- the information standards are developed to ensure consistency and common understandings of the information shared, and include classifications, controlled terms, concepts and their definitions, and the Metadata which drives the template for the presentation of fact sheets. These standards are necessary to enhance the overall authoritative value and quality of the information shared in FIRMS and provides de facto a global framework for fostering information exchange on status and trends of resources and fisheries. Recent developments in these standards include a bi-dimensional set of Stocks status descriptors (for both Exploitation rate, and Abundance level), and a reporting template for fishery fact sheets.

Fact sheets and other FIRMS products: as a result of these sharing mechanisms, the FIRMS information products are web-based fishery reports formatted following a standard template, tagged with the agreed controlled terms for status and trends description, and presented in the form of homogeneous Resources or Fisheries fact sheets. The knowledge thus collated and organized might be

exploited in many ways to present synopses on the state of resources, or to enable clever searches, as anyone would expect from a database.

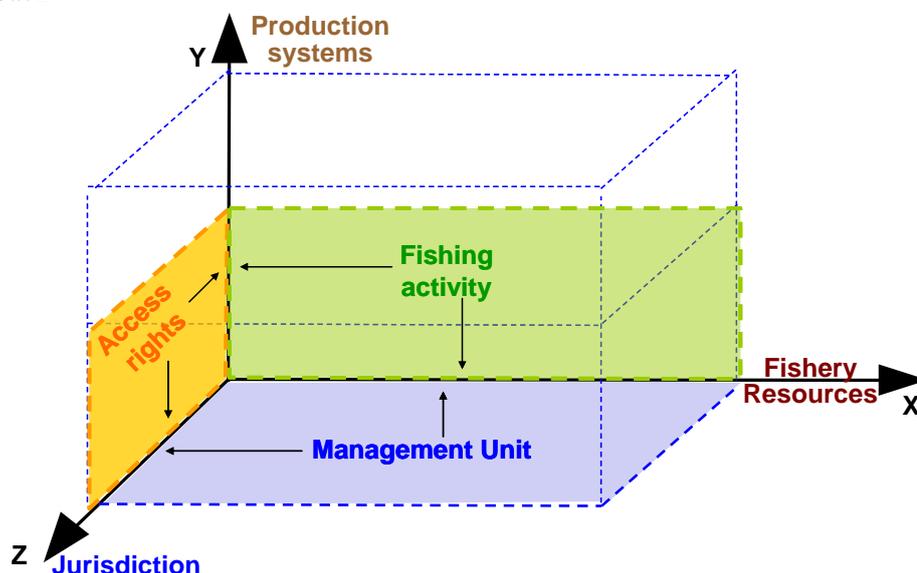
FIRMS Fisheries module: new horizons offered for knowledge exchange:

The initial priority of the core FIRMS partners was for a Marine Resource module able to disseminate their regional level fish stock assessments. Since the release of this module in 2006, the FIRMS efforts have been directed to the development of the Fisheries module which will satisfy Partners' needs related to the monitoring of the human component of the fishery system.

The design of the Fisheries module was approved by the FIRMS Steering Committee in July 2008, and the first Fishery fact sheets are currently being published on the internet.

The design of the Fisheries module encompasses the inherent complexity of the multifaceted approach to fisheries, as suggested by the conceptual model represented in Figure 1: the diagram helps visualise the various perspectives/perceptions people have on fisheries. Three fundamental approaches, represented on the main axes of the diagram, are proposed as the Fishery resource approach (biological view), the Production systems approach (socio-economic view), and the Jurisdictional approach (legal view); other perspectives at the cross-road of these main ones are represented on the plans of the diagram: a Management unit approach, a Fishing activity approach (with proxy concepts of Operational Unit⁵, or *Métier*⁶), an Access rights approach. FIRMS Partners believe that most existing definitions of fisheries can be mapped to this standard framework, without pre-empting the possibility to extend the standard framework if required.

Figure 1: Conceptual model of the multifaceted approach to fisheries



⁵ The concept of *Operational Unit*: "For the sake of managing fishing effort within a Management Unit, an Operational Unit is the group of fishing vessels practising the same type of fishing operation, targeting the same species or group of species and having a similar economic structure. The grouping of fishing vessels may be subject to changeover time and depends on the management objective to be reached." (GFCM/SCSA, provisional definition)

⁶ The concept of *Métier*: "A métier is usually defined by the use of a given fishing gear in a given area, in order to target a single species or group of species, e.g. inshore shrimp trawling, offshore flatfish trammel netting ... (Mesnil and Shepherd, 1990; Laurec et al., 1991).

This model gives insights to FIRMS efforts to organize and structure the information so that it is comparable, and to enable linkages and interactivity between the approaches. FIRMS Partners believe that such a model encompassing multiple views can contribute to and eventually support the Ecosystem Approach to Fisheries (EAF), as this vision leads to strong and integrated information and management system for aquatic resources and environments and their usage.

Figure 1: FIRMS membership - Area and species coverage

Figure 1a: current list of non tuna-RFBs contributing information to FIRMS

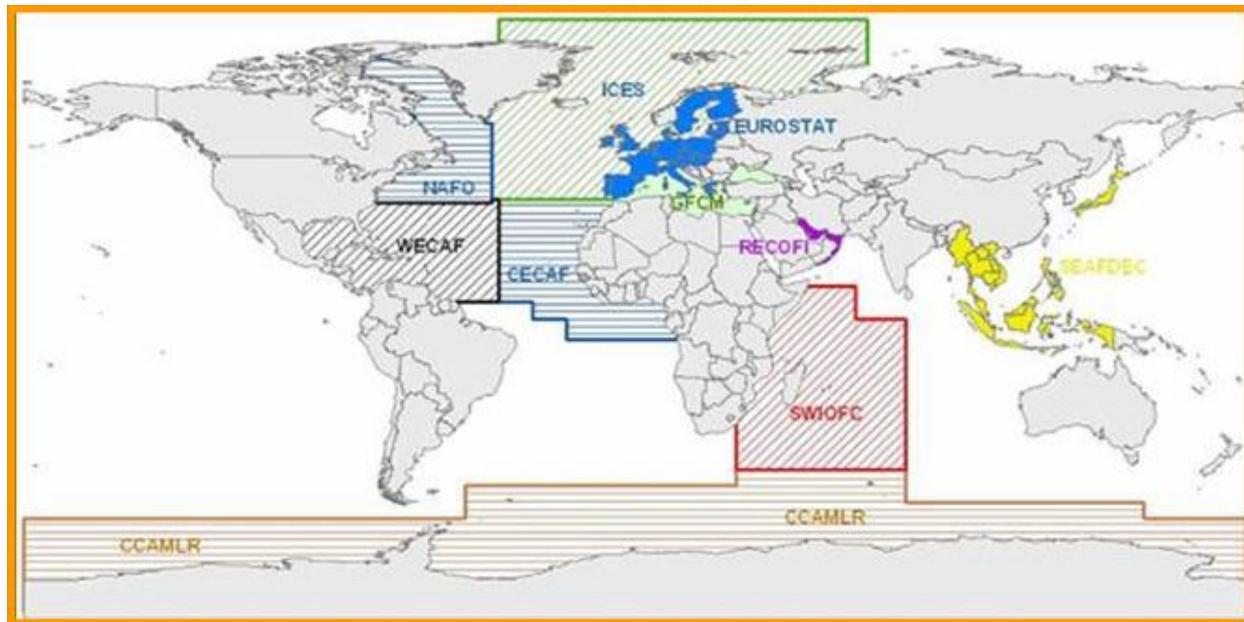
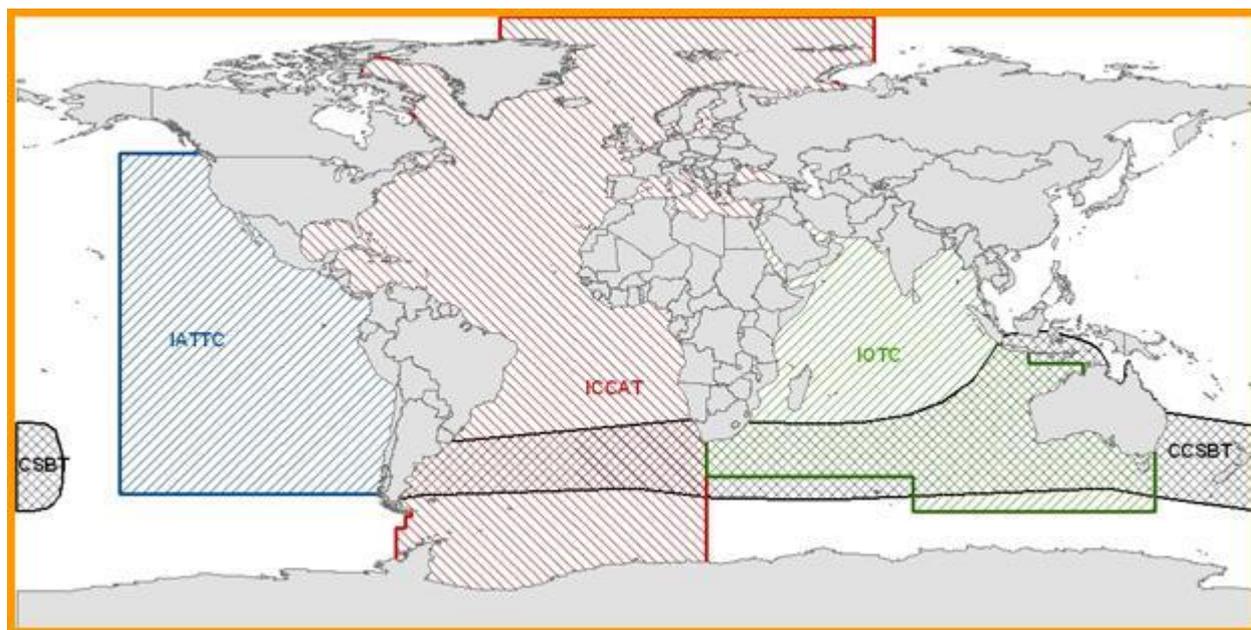


Figure 1b: current list of tuna-RFBs contributing information to FIRMS



FIRMS Partners

Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
Commission for the Conservation of Southern Bluefin Tuna (CCSBT)
Food and Agriculture Organization of the United Nations (FAO) - Fisheries Department
General Fisheries Commission for the Mediterranean (GFCM)
Inter-American Tropical Tuna Commission (IATTC)
International Commission for the Conservation of Atlantic Tunas (ICCAT)
International Council for the Exploration of the Sea (ICES)
Indian Ocean Tuna Commission (IOTC)
Northwest Atlantic Fisheries Organization (NAFO)
Northeast Atlantic Fisheries Commission (NEAFC)
Southeast Asian Fisheries Development Centre (SEAFDEC)
South-East Atlantic Fisheries Organization (SEAFO)
[Statistical Office of the European Communities (EUROSTAT)]⁷

FIRMS Observers

Permanent Commission for the South Pacific (CPPS)
International Whaling Commission (IWC)
Secretariat of the Pacific Community (SPC)
Western and Central Pacific Fisheries Commission (WCPFC)

⁷ Eurostat has frozen its role as EU's representative agency in FIRMS pending decision to transfer its role to a DG-MARE's unit

Annex 2: Draft workshop agenda**RECOFI-FIRMS Workshop on Resources and Fisheries inventories****Cairo, Egypt, 11-15 July 2011****DRAFT ANNOTATED AGENDA AND TIMETABLE****Author: FIRMS Secretariat****Day 1**Morning: 09:00 hours

1. Opening of session and Welcome address
2. Goals of the meeting
3. Election of chairperson and rapporteurs
4. Adoption of Agenda
5. Resources and fisheries inventories: Purpose and implementation framework
 - *setting scene of workshop and presenting fundamentals of the initiative*
6. Application of inventories in various context
 - *presentation of actual case studies, and discussion on usefulness of inventories at national and regional levels in the RECOFI area*

Afternoon: 14:00 hours

7. Presentation of national inventory validation:
 - *30 mns intervention by each country, including discussion;*
 - *each national representative to present the validation work held at national level; including the validation method, issues faced during the validation exercise, substantial and overall results of the validation, and areas where such inventory approach is found useful at national level.*

Day 2

Morning: 09:00 hours

8. Regional consolidation Working Groups
 - *few working groups created to address issues established during previous agenda items, with the objective of consolidating inventories at regional level.*

Afternoon: 14:00 hours

8. Continue the regional consolidation working groups, and personal trainings if needed.
9. Working Group reports – regional consolidation of national inventories
 - *Working groups will report their work to the plenary.*

Day 3

Morning: 09:00 hours

10. Overall evaluation of inventory guidelines, and suggestions to improve them
11. Next steps – road map towards publication of RECOFI inventories in FIRMS
 - *meeting will agree on outstanding work to be carried out, and formulate recommendations to forthcoming RECOFI-SC meeting.*

during the statistical working group meeting

12. Drafting of the report
 - *secretariat and session rapporteurs will finalise individual contributions to the meeting report, and a joint report adoption session later in the week will review and endorse the main recommendations.*