

**FIRMS Steering Committee Meeting****Second Session****Copenhagen, Denmark, 25-26 February 2005****Items of FIRMS technical Requirements subject to Debate****Author: FSC Secretariat****I. FIRMS WEB-SITE**

- a) *FIRMS portal*
- b) *FIRMS partners descriptions*
- c) *FIRMS search pages*

II. FIRMS CONCEPTS AND MODELS

- a) *Information architecture for stocks and fisheries*

III. STREAMLINED WORKFLOW

- a) *Automated production of XML reports*

IV. STANDARDS

- a) *Naming conventions: stocks, fisheries*
- b) *Standards enforced at reference data level*
- c) *RSS Metadata standards for sharing News*
- d) *AGMES for resource description*
- e) *Bibliographic standards*

I. FIRMS WEB-SITE

The draft FIRMS home page is presented to the FSC2 for comments. FSC2's inputs are in particular requested for:

Final decision on the internet domain name: considering that www.firms.org, or www.firms.net are internet domains already owned, and taking advantage of a recently established policy for Domain names at FAO, it is proposed that the FIRMS web-site URL be <http://firms.fao.org> (or <http://FirmsPartners.fao.org>).

Comments and guidance on the content and layout of:

- the draft FIRMS home page
- the draft fact sheets presenting FIRMS partners' institutions
- the recently redesigned FIGIS Marine Fisheries gateway page and its related search page, which constitute a possible implementation for the FIRMS web-site to provide an access to the FIRMS stocks and resources data base

Comments and guidance on ways to efficiently share News items on the FIRMS web-site:

The FIRMS web-site built on the FIGIS Organizations domain seamlessly interoperates with other FAO corporate systems such as News and Events management system (NEMS), and Virtual Library system. In particular FIRMS partners can be authorised to use the NEMS system to feed news to FIRMS. Alternatively, the adoption by FIRMS partners of a News XML standards (RSS) would enable dynamic feeding of relevant News to FIRMS from partners News management systems.

II. FIRMS CONCEPTS AND MODELS

a) *Information architecture for stocks and fisheries*

The FIGIS-FIRMS 2002 methodological workshop provided the technical framework guiding the elaboration of the FIRMS module requirements document. While this workshop introduced the need for considering the concept of Management Unit, it did not specify clearly how to interrelate it with both the Aquatic Resource and Fishery concepts. Neither did it clearly indicate how to differentiate the concepts of Resource and Fishery in a context of highly diverse definitions at global level.

Therefore, the FIRMS Secretariat had to base the models proposed in the requirements document on some level of interpretation, and did so with the concern of clearly discriminating the concepts of Resource and Fishery. The technical discussion which ensued the review of the requirements document led to present alternative solutions for the modeling of the Aquatic Resource, Fishery and Management unit concepts.

The FSC2 is called to discuss the validity of these various models, and to make a final decision as to the most appropriate one or formulate recommendations.

Elements underlying the modeling options (see also FIRMS FSC2/2005/4b):

The Aquatic Resource is fundamentally a biological concept, while the Fisheries concept implies a notion of fishing activity. Beyond the definitions, it is important in FIRMS to help differentiate the two concepts through use of a different set of reporting topics.

While the “Biological assessment” topic is certainly specific to the Resource concept, the issue lie with how much the “Exploitation” and “Management” topics discriminate the Resource and Fishery concepts.

“Exploitation” topic: in the first option, this topic as endorsed by the FIGIS-FIRMS 2002 workshop describes the components of Aquatic Resource exploitation, ie the fisheries exploiting the Resource and the exploitation indicators such as catch, effort, size of fish caught, etc... in an attempt to clearly differentiate the Resource and Fishery concepts, the second option is the model proposed for the FIRMS module with the understanding that a report focussing on Exploitation (ie a fishing activity) primarily describes a Fishery. A third option would be to present in a Resource report the exploitation elements (ie fisheries and exploitation indicators) under a more general topic entitled “Factors affecting the Resource/Stock”, together with other factors such as fishing technology, environment or Regulations. This third model has the merit over the first one to introduce a semantic nuance clearly highlighting Resource considerations, and to encompass as well other elements which certainly also explain Resource abundance variations.

“Management” topic: the first model proposed is based on the statement that “what is managed are Fisheries, not Resources”. In other words, while Aquatic Resource can be the target of the management, the unit used as instrument of management is the Fishery. Therefore, only Fisheries may potentially be considered as Management Unit, which in turn entails that the “Management” topic is specific of managed Fisheries. The second model understands that both Resources and Fisheries may potentially be considered as Management units, consequently the “Management” topic applies to both concepts.

III. STREAMLINED WORKFLOW

a) *Automated production of XML reports*

*The experiment held jointly between FAO and ICES in January 2005 on the streamlining of information contributions to FIRMS from ICES source documents is **presented to FSC2 for information and further guidance.***

The mission had to respond to the following terms of references:

1. present the different solutions foreseen in FIRMS with respect to information transmission channels, and accordingly confirm with ICES staff the objectives of the ICES to FIRMS streamlining process¹;
2. analyze the existing editing procedures and tools involved in production of ICES's ACFM reports and take into account ICES's plans respect evolution of these procedures;
3. understand ICES plans, skills and manpower with respect to its overall information systems;
4. according to findings on the above items, and referring to the latest version of the ICES case study for FIRMS² together with the revised mapping between ACFM topics and FIRMS standard elements, suggest solutions which can be realistically implemented and tested during the first semester 2005, as well as a medium term perspective and related conditions; these solutions should be drafted in the form of a guidelines document for consideration and approval by ICES staff;
5. elaborate a work plan proposal accordingly, to be signed off by both ICES and FAO.

ICES handles as many as 150 stock status reports per year. As a FIRMS partner, contributing status and trends information to FIRMS in a timely basis for such a volume of information can only be envisaged if the task is semi to fully automated. During this mission, a prototype application was developed showing that an automated procedure can be applied for the preparation of FIRMS XML compliant files from ICES original MS-Word documents. Chaining up the different transformation sequences was not done in this prototype but can be envisaged in order to optimize the transformation process. Conditions for running successfully this kind of transformation on a production basis are i) that the editing of original word documents be done according to strict word template rules; ii) internal skills be available to intervene on the XML and iii) arrangements be made to ensure maintenance of the transforming application (mainly XSL coding).

Other issues emerged that should be matter of discussion by the FIRMS Steering Committee:

- Choice of technology for the tools to be used as converter between MS-word and FIRMS Xml: two solutions were considered during the experiment (Upcast and MS-word 2003). FSC2 could consider each partner's policy on internal publishing work as this would provide guidance on the type of tool to be used as converter. Adopting a common tool would optimize development and maintenance within FIRMS partnership.

- The reordering of original sections: the presentation of the ICES original headers in FIRMS web pages would depend on whether the original ICES header matches a FIRMS standard topic element; a reordering of sections may be unavoidable in FIRMS.

FAO jointly with ICES will finalize the development of this prototype during 2005, which could then be applied to other FIRMS partners ready to meet the conditions.

¹ This process may range from semi-automated to fully automated solution.

² This December 2004 version integrates the draft FIRMS xml schema (or dtd) as per requirements under discussion with FIRMS partners

IV. STANDARDS

a) *Aquatic Resources and Fisheries: FIRMS naming conventions*

For the sake of clarity in FIRMS system, in order to have a homogeneous presentation or to facilitate search, the naming of Aquatic Resources and Fisheries has to follow some conventions. At the same time, data owners have their own naming conventions, which they want to be reflected within FIRMS. Where the concept of Aquatic Resource is quite simple and always defined with the two same components, the concept of Fishery is broader, which makes more difficult the establishment of naming conventions.

The FSC2 is requested to comment and make decisions on the proposed naming conventions.

1. Objective

In FIRMS system, each Marine Resource or Fishery is represented by one FIGIS Reference Object, and by the FIRMS Observation object(s) attached to each Reference Object.

The naming attributes proposed for a reference object are:

- FIRMS name in English
- FIRMS name in French
- FIRMS name in Spanish
- A local name selected by the data owner. This local name might be in any language.

The naming attributes proposed for a FIRMS observation object are:

- FIRMS name in the 5 Official FAO languages: English, French, Spanish, Arabic and Chinese.
- Local name in different languages.

The purpose of this document is to present for discussion and validation different criteria to be used as FIRMS naming convention for Aquatic Resources and Fisheries. The discussion will be based on the English name but we make the hypothesis that it is applicable to the 5 official FAO languages.

2. Aquatic Resources

2.1 Concepts

The term "Aquatic Resource" represents a fishery biological concept which covers all types of association between a species (or a group of species) and an area. The term stock is more restrictive. It delimits in space distinct breeding populations. According to these definitions, a stock is a particular example of Aquatic Resource.

2.2 Rules for naming convention

- i. The name of an aquatic resource should show off both its biotic component and its area component.

- ii. The biotic component of the aquatic resource name should be based on common name used by international classifications (e.g. ASFIS for taxonomic names). If the biotic component includes more than one names, the comma (“,”) is used as separator.
- iii. The area component should be the name used for the area, which means that the use of codes or acronyms should be avoided, or put at the end in parenthesis. The name of the area should follow international or regional naming classifications and conventions (country names, Oceans and seas names, etc...). When the area component includes more than one name, they are separated by a comma (“,”).
- iv. The biotic component and the area component are separated by the symbol “ – “.

Examples:

Source	Local Name	FIRMS English name
CECAF	Sparidés dans la région nord ouest africaine	Seabreams - Northwest Africa
CECAF	Pageot (Pagellus bellottii) au Maroc, Mauritanie, Sénégal, Gambie 35° 45"-12° 18"	Red pandora - Morocco, Mauritania, Senegal and Gambia
ICES	North-East Arctic haddock (Sub-areas I and II)	Haddock - Barents Sea, Norwegian Sea, Spitzbergen and Bear Island
ICES	Nephrops in Division IVa, West of 2°E, excluding Management Area F (Management Area G)	Norway lobster - North Sea (Fladen)

2.3 Some particular cases

Species for which there is only one stock

When there is only one single stock for a species, the common name of the species includes sometimes the name of the area delimitating the stock. In that case, when referring to the whole stock, it is useless to include in the name a specific component for the area. Or sometimes, the name of the species, even if not including the area name is used by authors to designate the whole stock (e.g Southern Bluefin tuna, Pacific Bluefin tuna).

Example:

Source	Local Name	FIRMS English name
IATC-SPC	Pacific bluefin tuna	Pacific bluefin tuna

Resources at global scale

When referring to all the stocks of a species (or a group of species), the term “global” is used as area component of the resource name.

Example:

Source	Local Name	FIRMS English name
FAO	All Bluefin tuna species	Bluefin tuna species - Global

Different stocks of the same species within the same area

Different populations of the same species may be located in the same area at different season. In that case, the biotic component must include an additional qualifier in order to make the name of each stock unique.

Example:

Source	Local Name	FIRMS English name
ICES	Herring in Sub-divisions 22-24 and Division IIIa (spring spawners)	Spring Spawning Herring - Skagerrak and Kattegat
ICES	Herring in Sub-area IV Division VIIId and Division IIIa (autumn spawners)	Autumn Spawning Herring - North Sea, Eastern Channel, Skagerrak

3. Fisheries

3.1 Concept

A Fishery is an activity leading to the harvesting of fish, within the boundaries of a defined area. The Fishery concept fundamentally gathers indication of human fishing activity, including from economic, management, biological / environmental and technological viewpoints.

The identification of a fishery is the result of a segmentation established using a set of criteria related to the domain of interest of the author. Consequently, the nature of the keywords used to name a fishery is variable. In addition, the identification of a fishery might be the result of successive segmentations, which increase the number of keywords necessary to define a meaningful name.

3.2 Rules for naming conventions

- i. The FIRMS name of a fishery is established as follow:

<list of key words> Fishery – <Area name>.

- ii. When an international classification is available, the keyword selected for a criterion should be taken from this classification (e.g. The International Standard Statistical Classification of Fishing Gear for fishing gears).

- iii. The number of keywords should be limited to the main criteria and should not exceed 3. Within an area, a fishery name should be unique. When more than one keyword is used, they should follow the following order:
- Sea environment (habitat of the target species)
 - Fleet: production system, flag state, etc...
 - Fishing technique (vessel type, gear),
 - Target species (or group of species).
- iv. When compatible, the keywords included in the local name should be kept in the FIRMS name.
- v. The term Fishery is not compulsory; when more appropriate, it may be for example replaced by “Management Unit”, or “Operational unit”, etc...
- vi. The area should be a name, which means that the use of codes or acronyms should be avoided, or put at the end in parenthesis. The name of the area should follow international or regional naming classifications and conventions.
- vii. When the identification of a fishery is the result of successive segmentations, the name of a fishery should harmoniously complement the keyword(s) already used to name the “parent” fishery. When presenting a fishery, the software will provide a facility to display the name of the related fisheries (“parent” fishery and sub-fisheries).

3.3 Some examples

Source FAO – Inventory of Fisheries – Jamaica

Local Name	FIRMS English name
Coastal pelagic fisheries	Costal small pelagic fishery - Jamaica
Large pelagic fishery	Large pelagic fishery - Jamaica
Coral reefs finfish fishery	Coral reefs finfish fishery - Jamaica
	Crustacean fisheries - Jamaica
Artisanal lobster fishery	Artisanal spiny lobster fishery - Jamaica
Industrial spiny Lobster Fishery	Industrial spiny lobster fishery - Jamaica
Shrimp fishery	Shrimp fishery - Jamaica
Industrial Queen Conch fishery	Industrial queen conch fishery - Jamaica

Source FAO – Inventory of Fisheries in the Eastern-Central Atlantic

Local Name	FIRMS English name
Maroc - pêche artisanale de poissons démersaux à la palangre	Artisanal longline fishery - Morocco
Mauritanie - Pêcherie pélagique côtière	Coastal pelagic fishery – Mauritania
Gambie - Pêche industrielle pélagique côtière	Coastal industrial pelagic fish fishery - Gambia
Gambie - Pêche artisanale pélagique côtière	Coastal artisanal pelagic fish fishery – Gambia
Gambie - Pêche artisanale au filet maillant à sole	Artisanal driftnet sole fishery - Gambia

IV. STANDARDS

b) Standards enforced at reference data level

*As other systems established within FIGIS (eg the statistical system), the FIRMS system interacts with the FIGIS reference tables management system (RTMS) which primary purpose is to store and organise standard concepts, terms, objects and classifications. **The use of FIGIS RTMS in FIRMS is presented to FSC2 for comments and guidance with regard adoption of standards.***

1. Introduction

The References Tables Management System (RTMS) is the FIGIS module used to administrate and classify the domain objects, standards and other controlled terms. The RTMS references all the Aquatic Resource, Fishery and Management System objects defined by FIRMS partners. It also references the Organizations representing the partners, the data collections they define for reporting as well as the controlled terms used as standard qualifiers in the FIRMS reports.

Each reference of the RTMS has an identifier, used to establish its Uniform Resource Identifier (URI) or unique address of the object for INTERNET access. Each reference is defined by a set of attributes specific to the FIGIS domain or to the controlled term considered. We present here below the attributes proposed as standard to reference an Aquatic Resource or a Fishery object. We present also the default criteria used to classify in hierarchies the objects of the Aquatic Resource and Fishery FIGIS domains.

Referencing of domain objects is part of the protocol implemented in FIGIS to ensure the quality of the information published. No reporting will be possible on Aquatic Resource or Fishery not referenced in the RTMS.

2. Aquatic Resource and Fishery Domain Objects in the RTMS

The attributes proposed to reference an object from the Aquatic Resource domain are:

- Unique Identifier (to be used for URI)
- Name(English)
- Name(French)
- Name(Spanish)
- Local Name
- Stock (Yes/No)
- Management Unit (Yes/No)
- Spatial Scale (term from a controlled list)
- Seawater Environment (term from a controlled list)
- Bottom Type (term from a controlled list)
- Climatic Zone (term from a controlled list)
- Shared Stock Type (term from a controlled list)
- Inventory Identifier

The attributes proposed to reference an object from the Aquatic Resource domain are:

- Unique Identifier (to be used for URI)
- Name (English)
- Name (French)
- Name (Spanish)
- Local Name
- Perspective (term from a controlled list)
- Start Year
- End Year
- Management Unit (Yes/No)
- Inventory identifier

3. Hierarchies and Title objects

Hierarchical positioning of reference objects belonging to the same FIGIS Domain is another function handled by the RTMS. It will be used in the FIRMS users interface by different tools to facilitate the selection or the display of reference objects presented in dynamic tree structures (see Figure 1).

Figure 1 - FIGIS Reference Tables Management System – Hierarchy Marine Resources by inventory

The screenshot displays the FIGIS Reference Tables Management System interface. On the left, there is a sidebar with navigation options: 'Screen' (Table selector, Table explorer), 'Columns' (None, Select, All), 'Hierarchy' (Alphabetic, Resource by Inventory), and 'Advanced user's login' (Username, Password, Login button, Current name: figis_guest). Below the sidebar are links for 'Site map' and 'Contact us'. The main content area shows a tree structure of marine resources. At the top, there are page controls: 'Page 1 2 3', a search box with a 'Locate' button, and 'Page size 25'. The tree structure is as follows:

- Marine Resources in the Atlantic Ocean and adjacent seas
 - All resources - Eastern Central Atlantic (FAO Statistical Area 34)
 - Tuna and Tuna-like species in the Atlantic Ocean and adjacent seas
 - Albacore - Atlantic and Mediterranean Sea
 - Albacore - Mediterranean Sea
 - Albacore - North Atlantic
 - Albacore - South Atlantic
 - Bigeye tuna - Atlantic
 - Blue marlin - Atlantic
 - Northern bluefin tuna - Atlantic and Mediterranean Sea
 - Northern bluefin tuna - East Atlantic and Mediterranean Sea
 - Northern bluefin tuna - West Atlantic
 - Sailfish and Spearfish - Atlantic
 - Sailfish and Spearfish - East Atlantic
 - Sailfish and Spearfish - West Atlantic
 - Skipjack tuna - Atlantic
 - Skipjack tuna - East Atlantic
 - Skipjack tuna - West Atlantic
 - Small tunas - Atlantic and Mediterranean Sea
 - Swordfish - Atlantic and Mediterranean Sea
 - Swordfish - Mediterranean Sea

The default FIGIS hierarchies related to the 3 domains Aquatic Resource, Fisheries and Management Systems will be eventually completed by hierarchies specific to FIRMS according to Data owners' requirements.

The criteria selected to establish the FIGIS default hierarchies are:

- the inventory to which the object belongs (Regional Fishery Body and FAO Fisheries Statistical Area)

Within an inventory, FIGIS follows the hierarchy set by the author(s) of the inventory. In general, the first level is based on a geographic criterion (sub-region, EEZ, country, etc) and sub-levels are based on other key attributes of the domain (e.g. group of species for Aquatic Resources).

Titles objects

For the sake of clarity, it is sometimes useful to introduce in a hierarchy dummy objects on which no reporting will be done. These objects are used as grouping units of other objects of the domain.

3. Ownership and observations

Each observation against a referenced domain object of the RTMS is made under a collection, and the Organization owner of this collection indicates also the owner of the observation.

The owner of a specific observation called "reference observation" is considered as the owner of the reference object and controls the publication of all observations made against this reference object, including those prepared by other data owners.

IV. STANDARDS

c) *RSS Metadata standards for sharing News*

The FIRMS web-site could be fed from News items elaborated by all FIRMS partners. The most streamlined way for doing so is to agree on adopting a suitable international standard for easily sharing News. FSC2 is introduced to the RSS language for decision making on its adoption as a FIRMS standard.

RSS

RSS stands for Really Simple Syndication and is the name given to a simple and well-established computer language format used to syndicate headlines. Once a website creates an RSS feed they have created a means to allow others to syndicate their headlines. It was created by Netscape in 1999 and quickly diffused throughout the web, particularly by journalistic web sites.

Websites that publish new content often provide a list of 'news' links to their latest content. In addition to displaying these headlines on their own websites, it is very common to make them available for syndication via RSS, so that other websites or applications can also include their headlines. Installing an RSS reader on one's PC is a way to be informed of headlines published by other selected sites.

UNFAO now runs an RSS feed for their News and Events that is available for use by any website worldwide to enable them to include FAO headlines in their website. This corporate level service is used by FIGIS and the FI department to input and retrieve fisheries News and Events, insuring that they are distributed to a wider audience.

The basic format simply contains a title, a link to the news item and a description, although FAO adds several optional fields providing additional information.

Sources:

<http://www.purplepages.ie/rss/>

<http://www.pcworld.com/resource/article/0,aid,111699,00.asp>

<<http://www.rssreader.com/rssreader.htm>>

IV. STANDARDS

d) *Dublin Core / AGMES for resource description*

*The FIRMS web-site could retrieve and present relevant FIRMS partners information resources provided a common standard is adopted for information resources description. The Dublin Core / AGMES standards already used by FIGIS and FIRMS are **introduced to FSC2 in order to encourage its adoption by partners.***

Dublin Core/AGMES

The Dublin Core Metadata Initiative (DCMI) is an open forum engaged in the development of indexing standards that support a broad range of purposes and business models. DCMI defines a number of elements (known as an 'element set') that are largely related to publishing. Here is an example of one element in the Dublin Core element set:

Element Name: Creator

Definition: An entity primarily responsible for making the content of the resource.

Comment: Examples of Creator include a person, an organization, or a service.

Typically, the name of a Creator should be used to indicate the entity.

The FAO, together with a consortium of other institutions has developed an extension to the Dublin Core element set that deals with the specifics of the indexing of both agricultural (including forestry and fisheries) and FAO resources. This extension is known as AGMES and has been formally presented to the DCMI community as an agricultural standard.

FIGIS uses the DC/AGMES standard to encode the metadata for all its factsheets. The use of this ISO/ANSI standard insures that they can be easily indexed and identified by almost any metadata-aware application.

Sources:

<http://dublincore.org/resources/faq/>

<http://www.dannyayers.com/2003/08/rss.htm>

<http://www.fao.org/agris/agmes/>

IV. STANDARDS

e) *Bibliographic standards*

The FSC2 is called to comment on the issues related to bibliographic standards in FIRMS, and provide guidance for further actions.

1. Place of Bibliographic references in FIRMS

Bibliographic references can be used for three different purpose in FIRMS. It should be possible to cite each electronic fact sheet published by FIRMS, therefore FIRMS needs to present a page presenting the “bibliographic citation” of each fact sheet from a “for citation purpose” link nested in that fact sheet. The “source(s)” used to elaborate the FIRMS fact sheets are also of bibliographic reference nature. Finally as in any book Partners can provide at the end of the fact sheets they contribute the relevant list of works cited; this list would appear under a label “bibliographic references”.

2. Issues and stakes underlying the adoption of standards for bibliographic references

Well established bibliographic standards exist but the complexity of the subject, the enormous volumes of records concerned and the existence of different communities of interest make it difficult to smoothly adopt common practices. Within FAO for example, the corporate and Departmental systems are not always aligned and the discrepancies noted become an obstacle to interoperability between systems. There are two major dimensions for FIRMS to consider:

- the choice of a citational style: this is a matter of quality and harmonisation in the presentation. Once a choice is made, implementation should be relatively easy since all elements of the bibliographic citation are based on Dublin Core and AGMES Metadata standards (ie are constructed together with the FIRMS page).

- the presentation style of bibliographic references for sources or bibliographic references (lists of work cited placed at the end of documents): presentation style include elements such as ordering of the elements of bibliographic references, use of fonts (eg italics for name of a journal) and other conjunctions elements (“&”, “;”, “in”). FIRMS should first consider the need for harmonising the presentation of bibliographic references, eg as a pledge of quality. A contrario, FIRMS should consider if and under which conditions it would be possible to respect presentation styles of each partner. The FIGIS experience tells that this is not an easy task. It is likely that no decision can be made before policies adopted by the FIRMS partners in this regard will have been analysed in terms of their possible discrepancies.

- the use of bibliographic elements for dynamic links to target information resources (eg ASFA abstracts, FIRMS partner systems): the FIGIS adopted technology makes it possible to exploit the single elements of a bibliographic reference (title, publisher, author, date, ISBN, ISSN, etc...) to dynamically build URLs and send requests to partner systems where these partner systems offer standard protocols to access their information resources. Being OpenURL¹ compliant means for example that a system’s protocol is able to interpret the ISSN and ISBN numbers. Exploiting such capacity however implies that FIRMS partners

¹ OpenURL is a standard adopted among publishers to establish persistent executable links from an information resource to a target

contributions to FIRMS be tagged according to conventions that the selected protocols can use. Considering FIRMS quality assurance requirements including the possibility to easily access to the source documents, it seems that such facility would contribute to implement FIRMS' information management policy. A first priority would hence be to encourage application of appropriate tagging to the Source element. Applying appropriate tagging to the bibliographic references list cited at the end of a document would be left to the consideration of the partner.