Food and Agriculture Organization of the United Nations

FIRMS e-TWG on the Global Record of Stocks and Fisheries – GRSF
30 September – 1 October 2021

FIRMS

FISHERIES AND RESOURCES MONITORING SYSTEM

The Global Record of Stocks and Fisheries

Author: FIRMS Secretariat with the contribution of FAO colleagues, SFP, UW, FORTH

Food and Agriculture Organization of the United Nations

Outline

1. Opening session, welcome address, and adoption of agenda …	*N. Cummings – M. Taconet*
2. Introduction to GRSF …….	*FAO (M. Taconet, A. Gentile)*
3. Report on the technical work ……	*FAO (A. Gentile, B. van Niekerk), FORTH, SFP*
4. Pilot validation of UUIDs and release of GRSF VRE - experimented validation & Publication method ……	*FAO (A. Gentile, B. van Niekerk), SFP, UW*
5. Report on testing of UUIDs ……	*SFP, ICES, UW, FAO (A.E. Nieblas)*
6. Report on the GRSF database ……	*FAO (A.E. Nieblas, A. Gentile, B. van Niekerk), SFP*
7. Data use and Partners' perspectives on the GRSF ……	*All in open discussion, Introduced by N. Cummings, with contributions from SFP, UW, FAO Assessment, FAO Value Chains, FAO information and knowledge management team*
8. Conclusions and Recommendations for FIRMS FSC12	

1. Welcome address

Recalling FSC11 recommendations

FSC11 (2019) Recommendations	Status
FSC endorsed the proposed Collaborative Institutions (namely IRD for the Tuna Atlas; and UW, SFP and FORTH for the GRSF) (FSC11/D10.2).	
FSC endorsed the GRSF value proposition and agreed to associated actions (FSC11/D10.3).	
the Secretariat would need to **complete the technical work on the GRSF system**	
The Secretariat will **communicate lists of stocks and fisheries with main descriptors and UUIDs to each partner** for review and validation	
TWG to review Partners' steps to review and validate GRSF UUIDs, and consider holding a physical meeting during the first half of 2020 (FSC11/D10.4). Partners have committed to timely contributions of information 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.	
FSC agreed to publicly launch the pilot GRSF during suitable future events, noting associated tasks (FSC11/D10.5)	
FSC agreed to broadly disseminate information on the GRSF (FSC11/D10.6).	

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Acknowledgments

We would like to say thank you to all present and past colleagues who contributes to this endeavor

- FAO (NFI & FIRMS): E. Blondel, N. Bougouss, N. Cummings, A. Ellenbroek, A. Gentile, G. Gorelli, N. Gutierrez, A.E. Nieblas, B. van Niekerk, A. Muñoz, J. Ryder, R. Sharma, M. Taconet, T. Vicary, Y. Ye
- UW (RAM database): C. E. Ashbrook, R. Hilborn, D. Hively, M. Melnychuk
- SFP (FishSource): P. Amorim, M. Mendes, M. Patel, S. Segurado, B. Spear
- FORTH: Y. Marketakis, Y. Tzitzikas
- CNR (iMarine): M. Assante, G. Frosini, F. Mangiacrapa, P. Pagano
- … and the RFBs colleagues, members of FIRMS, who attended the GRSF meetings to drive the development.

Useful links

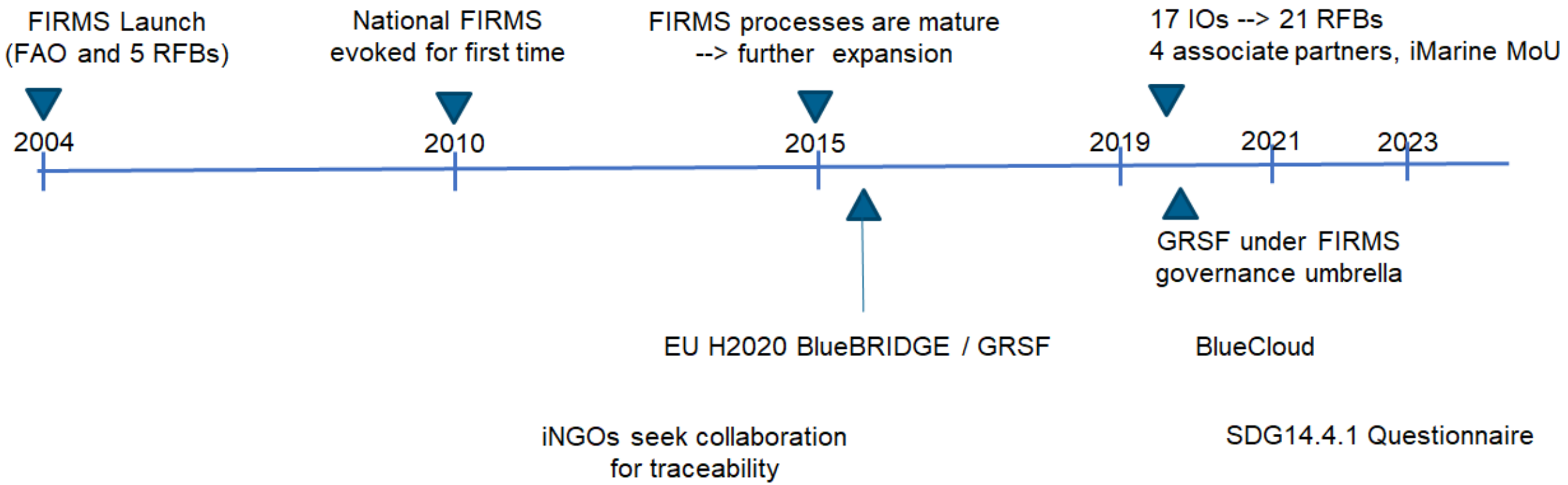
- GRSF catalogue https://i-marine.d4science.org/web/grsf/data-catalogue
- GRSF map viewer https://i-marine.d4science.org/web/grsf/map-viewer
- Online Survey - Consultation on FIRMS terminology https://forms.office.com/r/vMqwRCgtkf

2. Introduction to GRSF

Origins of GRSF

The SOFIA indicator on the status of stocks should be supported through a collaborative and transparent internet-based process, where those having monitoring responsibilities share information on individual stock status.

Starting with RFBs and extending to Countries.



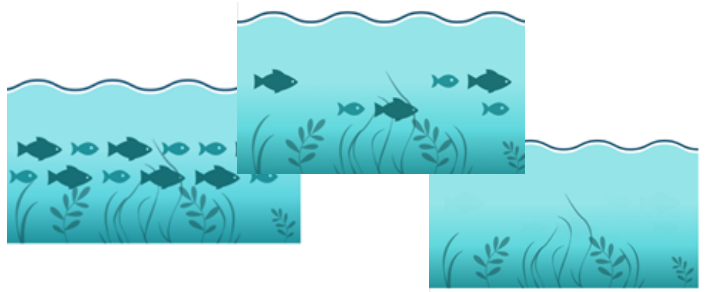
2. Introduction to the GRSF

GRSF has two technical objectives in support of two policy goals

1. Register a comprehensive list of distinct stocks and fisheries as part of a global repository
2. Federate knowledge on status/trends of stocks and fisheries across various sources,

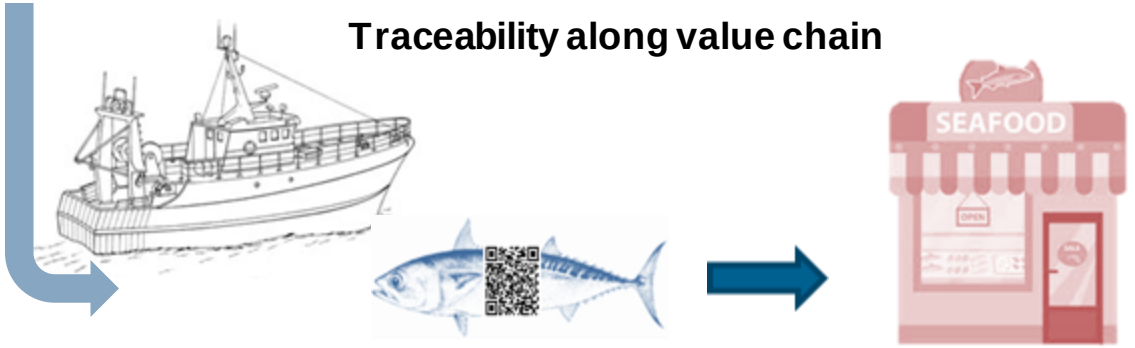
--> key services to:

I. Science stakeholders involved in “regional/global state of stocks indicators”



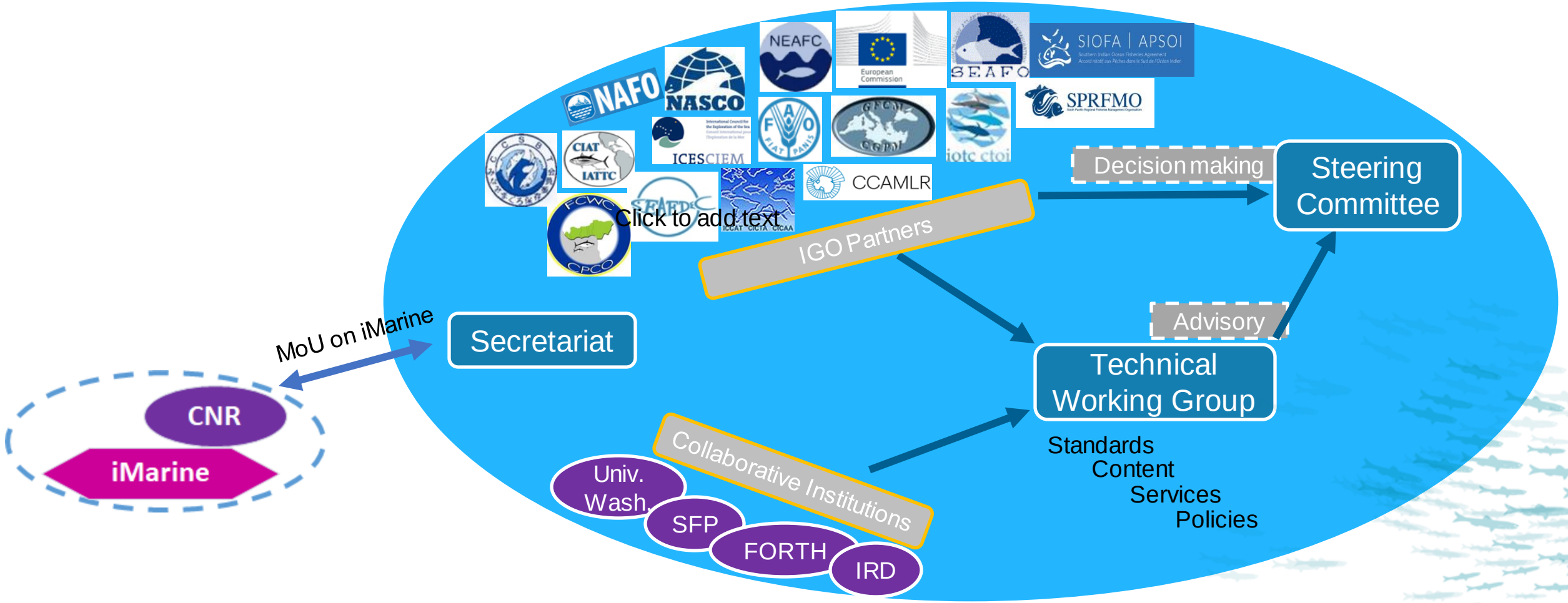
Status of Stock

II. Public and private actors involved in ecolabelling, traceability and sustainable fisheries



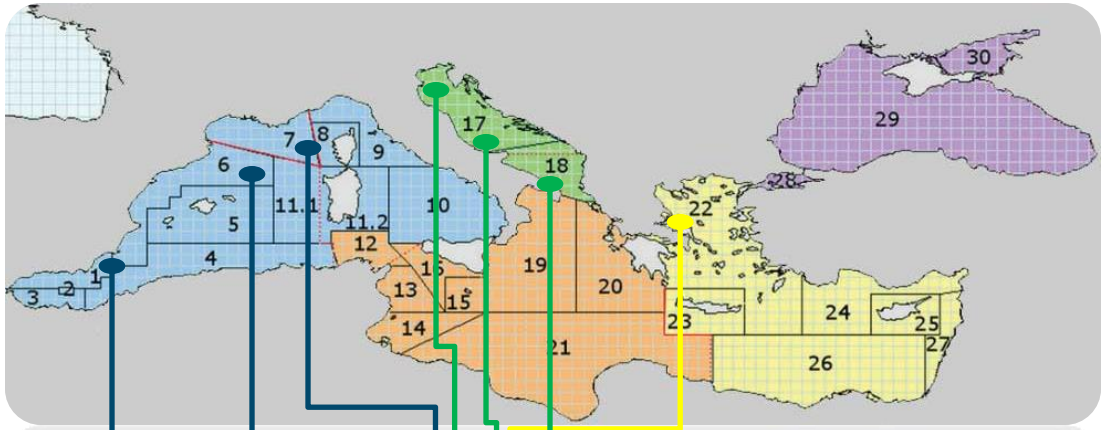
2. Introduction to the GRSF

GRSF relies upon a strong partnership operating under the FIRMS governance umbrella



2. Introduction to the GRSF

Universally Unique Identifiers (UUIDs) applied to Stocks and Fisheries
a new innovative global standard



Anchovy - Adriatic Sea — ID ANE + GSA17-18 UUID 6e44250b-fd04-337e-91d7-f7b6840bb862
Anchovy - Aegean Sea — ID ANE + GSA22 UUID 63d689ec-ef49-3b22-a37a-bb49d00e1638
Anchovy - Gulf of Lion — ID ANE + GSA7 UUID a965318a-4b29-3b6f-b9a6-4ed6a676c779
Anchovy - Northern Adriatic Sea — ID ANE + GSA17 UUID 72a47857-eb5a-324f-8f69-78b622bc55e7
Anchovy - Northern Alboran — ID ANE + GSA1 UUID 834d0773-23ed-3d34-bbde-253a3ef5eaa6
Anchovy - Northern Spain — ID ANE + GSA6 UUID e5de7186-6b88-325e-8cd1-68d933943cb4
Anchovy - Southern Adriatic Sea — ID ANE + GSA18 UUID 4c437c98-d37c-37a5-99d9-d5e4cd82360e
…… …… …… …… …… ……

Universally Unique Identifier (UUID)

to respond to whatever IT standard

Example **www.fao.org/grsf/f21113e9-0794-37aa-b7fe-bf49101361f3**

- The resolver can be customized
- UUIDs persist in case of changes of the semantic identifiers (i.e. updates of a record)

Try the (example) QRCode: Identifies as a FAO resource

UUID's: A de-facto standard for information collation and sharing

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2. Introduction to the GRSF

Semantic Identifier: each UUID also has a human-readable identifier, a new standard coding system for stocks and fisheries. This is useful for identification & validation, product labelling, etc.

Stocks <Species> + <Assessment Area(s)>

Fisheries <Species> + <Fishing Area(s)> + <Management Authority(ies)> + <Geartype> + <Flag State>

Examples of semantic identifiers for stocks and fisheries

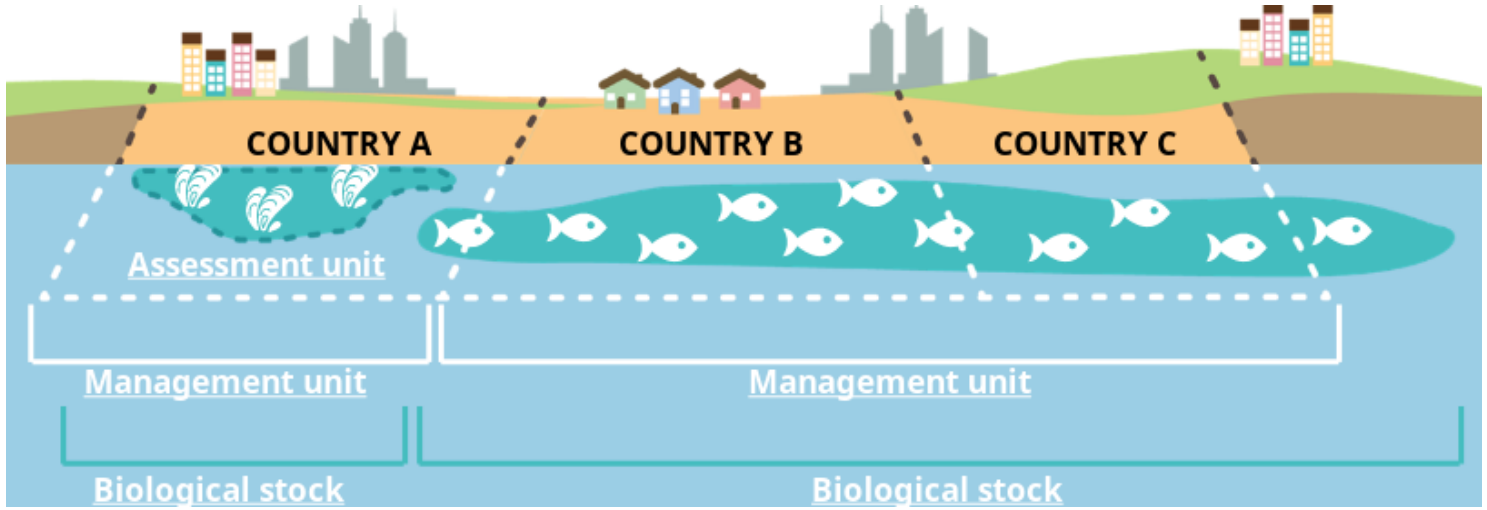
Stocks: asfis:**GAL** + fao:**34.3.13**; fao:**34.3**.3 → Galeoides decadactylus - Sherbro - Atlantic, East central

Fishery: asfis:**COD** + fao:**21.3.M** + int:**NAFO** + isscfg:**OTB** + iso3:**LTU** → Gadus morhua - Atlantic, Northwest/21.3.M - Northwest Atlantic Fisheries Organization (NAFO) - Bottom otter trawls – Lithuania flag state

A semantic identifier implements a flexible combination of standards from CWP, FIRMS and other standards

2. Introduction to the GRSF

Enrichment of FIRMS records with the new descriptors



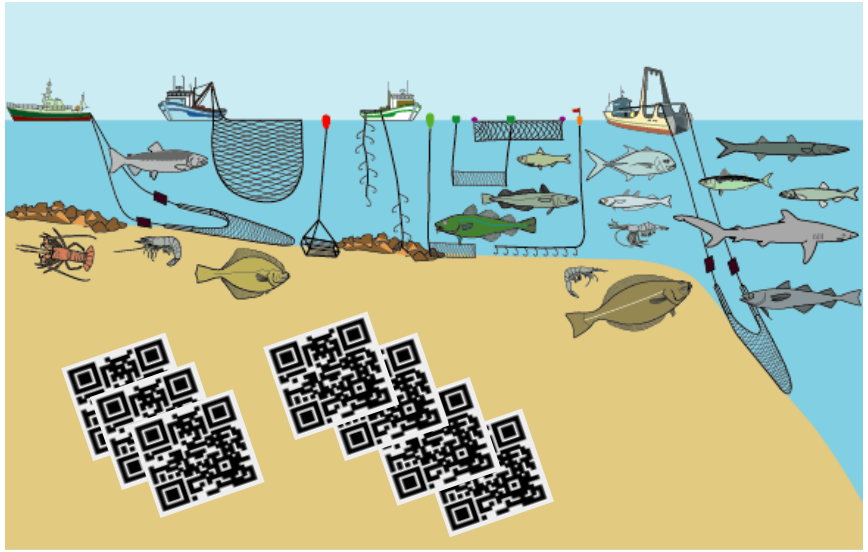
Source: FAO, 2019. Elearning: SDG Indicator 14.4.1 - Fish stocks sustainability.

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 (FSC11, May 2019)."

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 (FSC11, May 2019).

Management unit: The area where the fish is 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 a regional, national or local scale by a management authority, including through stakeholder consultation. For example, the Management unit uses the assessment done in the Assessment unit to define management regulations. (FSC11, May 2019).

Fishing Unit: A fishery targeting a **single species** (or group of species) conducted by a **single flag state** using a **single fishing gear** operating in a water area, which is possibly managed by a single empowered management authority or treaty under a unique set of management measures.



Source: Adapted from FAO Fishing techniques fact sheets

Information exchange requires common standards

3. Report on the technical work

Summary of technical activities

During the FIRMS intersessional period (May 2019 - Sep 2021) the following activities were carried out:

Under the FAO-FORTH LoA 2020

- Development of **Web Services (APIs)** and **Competency Queries**
- New **data harvest** logic and more efficient workflow (latest refresh June 2021)
- Improved records **matching algorithm**
- Improved handling of **standards** for the identifiers
- Support for third-party **data submissions** (e.g. SDG 14.4.1 questionnaire)

Under the FAO-CNR MoU and the Blue Cloud project

- Improvement of the GRSF **interfaces**: records catalogue, map viewer
- Consolidation of the infrastructure and workflow, e.g. user management panel for **records management**
- Wiki documentation

3. Report on the technical work

Summary of SFP technical work

SFP's FishSource exposes a number of API endpoints

- The Stocks endpoint is the primary one, listing summary information for all non-Salmon related
  - Stocks with no nested Assessment Units
  - Unascertained stocks (=Marine Resources)
  - Assessment Units

Detailed endpoints are then available to get specific information on:

- Fisheries
- Fishery Improvement Projects
- Management Units
- Maps and related GIS polygons
- MSC certified fisheries
- Narrative information
- Quantitative and qualitative data

Additional information on areas associated with Stocks and Assessment Units is pending for release this year

3. Report on the technical work

Summary of RAMLDB technical work

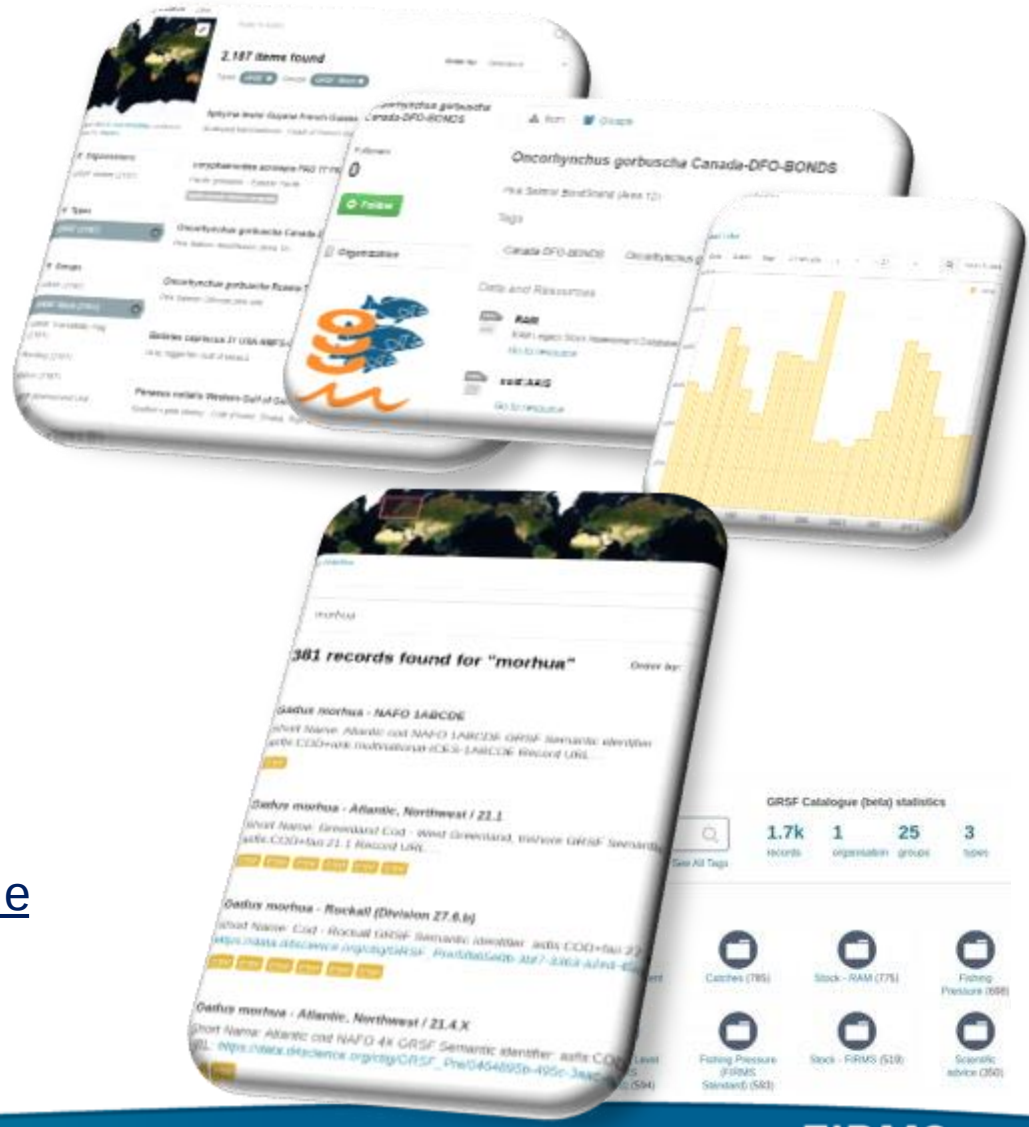
- The **latest version** of the RAM Legacy Stock Assessment Database is available for download through **Zenodo**
- The data **submission** to GRSF occurs at **any major update**, in Microsoft Access format.
- All RAMLDB records are (by definition) **Assessment Units**
- RAMLDB record **identifiers** include an internal stock ID, scientific name, area name. These are **mapped** to the GRSF UUIDs.
- Geographical coordinates for each area are also provided in the format of **Bounding Box** (the minimum rectangle enclosing an area)

3. Report on the technical work

Demo of the GRSF interface

The GRSF is handled in two environments:

- The GRSF **Admin** – for the review/approval/archival of records
- The GRSF **Public** – any users with rights to accessing the catalogue of records and the map viewer



Browse the:

- **Catalogue** https://i-marine.d4science.org/web/grsf/data-catalogue
- **Map Viewer** https://i-marine.d4science.org/web/grsf/map-viewer
- **Web services** and **competency queries**

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4. Pilot validation of UUIDs and release of GRSF VRE

Agenda item #4

In this agenda item, we will review ...

a) Activities as follow-up of FSC11
b) Experimented validation & Publication method
   - Workflow
   - Stocks
   - Fisheries

4. Pilot validation of UUIDs and release of GRSF VRE

a) Activities as follow-up of FSC11

- Validation of a subset of **UUIDs** and communication to FIRMS Partners (Nov.2019)
- Official launch of the GRSF **Pilot** at the FAO International Symposium on Fisheries Sustainability (Nov. 2019)
- **Addition** of the **UUIDs** to all FIRMS records published in the FIRMS website (Service developed, front-end in progress)
- Enrichment of FIRMS records with the new **descriptors** Biological Stock, Assessment Unit, and Management Unit (data model implemented, content and display in progress)
- **On-going** engagement with the core GRSF team for the development of the application and **validation** of the records (23 conf calls during the intersession beyond email exchanges and other minor calls)

Assessment Unit (2807)

Status of the GRSF record

Approved (1519)

Pending (1216)

Archived (72)


```
{
  "results": [
    {
      "FIRMS_id": "10353",
      "RAM_id": "CAPEIIa-V-XIV",
      "grsf_uuid": "e38ab7d8-e889-3dee-8fc4-17d8664abddd",
      "short_name": "Capelin IIa-V-XIV",
      "grsf_semantic_title": "Mallotus villosus - Norwegian Sea (Division 27.2.a) -
      East Greenland (Subarea 27.14) - Iceland and Faroes Grounds (Subarea 27.5)",
      "grsf_semantic_id": "asfis:CAP+fao:27.14;fao:27.2.a;fao:27.5",
      "resource_type": "assessment unit",
      "record_type": "STOCK"
    }
  ],
  "error": null
}
```


RESOURCE STRUCTURE				MANAGEMENT	
d	Biological stock	Assessment unit	Description	Management unit	Description
	Yes	Yes		Yes	
	No	No		No	
	Unknown				

4. Pilot validation of UUIDs and release of GRSF VRE

b) experimented validation & Publication method

Recalling workflow

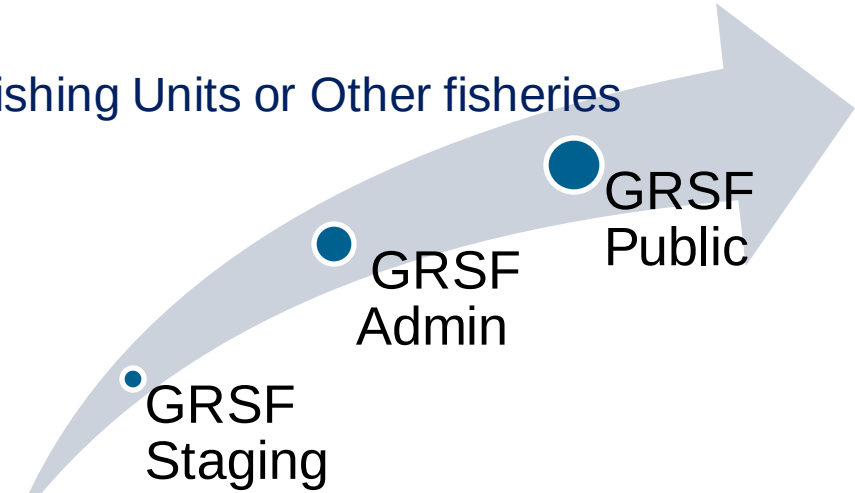
- The three DB sources (I.e. FIRMS, FishSource published fact sheets, RAM public database) have their **own validation** process for their data content

4. Pilot validation of UUIDs and release of GRSF VRE

b) experimented validation & Publication method

Recalling workflow

- The role of the GRSF is to produce **unique records**, comparing and merging records across a common set of **standards** for species, areas, gears, flag states, authorities
- Data are harvested from the 3 sources
    - With standard and conventions applied at import time:
        - RAM --> Assessment Units
        - FIRMS-FishSource -->Assessment Units or Marine resources; Fishing Units or Other fisheries



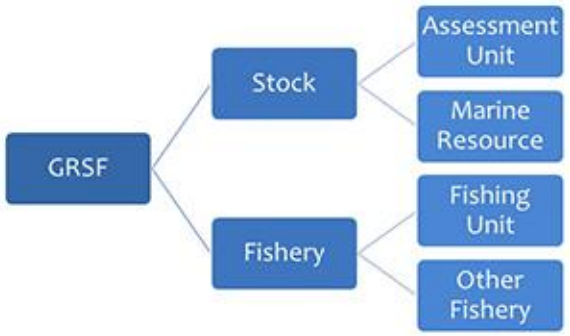
Validation

- **Standards** are **applied** to the records when possible
- Algorithm returning/scoring the **proximity** among records
- **Automatic merge** for matching records fully **compliant** with **standards**
- **Manual merge** for records with **no or incomplete** standards
- NO automatic approvals

4. Pilot validation of UUIDs and release of GRSF VRE

B) experimented validation & Publication method

- GRSF STOCK types -



=> All key information is available (species, area) + an assessment is available

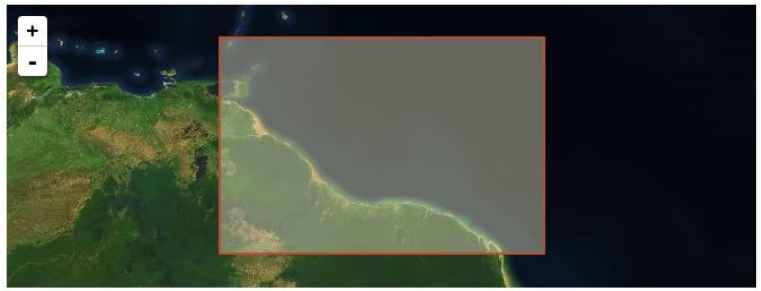
=> No assessment available, high-level taxon or undefined area (e.g. global)

Applying principles and standards for producing unique records

Mycteroperca interstitialis - French Guiana - Trinidad and Tobago

Short Name: Yellowmouth grouper - Continental slope of French Guiana to Northeastern Venezuela
GRSF Semantic identifier: asfis:MKN+eez:GUF;eez:TTO
Record URL: https://data.d4science.org/ctlg/GRSF/9cb7f93b-3fbc-34c9-b53b-bc9f0a50560d

Dataset extent



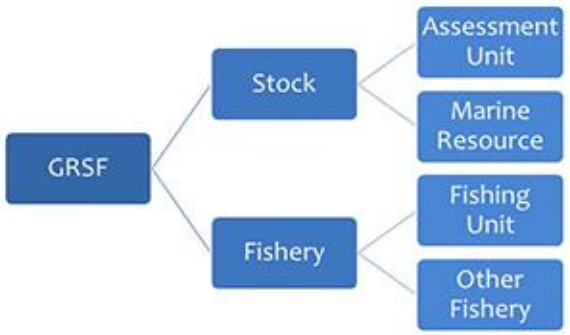
Tags

Assessment Unit | Code GUF System eez Name French Guiana | Code MKN Classification System ASFIS Scientific Name Mycteroperca interstitialis | Code TTO System eez Name Trinidad and Tobago | not connected | without similar records

4. Pilot validation of UUIDs and release of GRSF VRE

B) experimented validation & Publication method

- GRSF FISHERY types -



=> All key information is available (species, area, gear, flag state)

=> Fishery in a broad sense with missing key information

WECAFC Fishery Resources Report 2020

Saint Kitts and Nevis Oceanic pelagic fishery

Target Species

Scombridae
FAO Names : en - Mackerels nei, fr - Maquereaux nca, es - Caballas nep, ru - Скумбриевые

Istiophoridae
FAO Names : en - Marlins,sailfishes,etc. nei, fr - Makaires,marlins,voiliers nca, es - Agujas,marlines,peces vela nep

Coryphaena hippurus
FAO Names : en - Common dolphinfish, fr - Coryphène commune, es - Lampuga

Xiphias gladius
FAO Names : en - Swordfish, fr - Espadon, es - Pez espada, ru - Меч-рыба

Flag State
Saint Kitts and Nevis

Fishing Gear
Handlines and hand-operated pole-and-lines
Mechanized lines and pole-and-lines
Trolling lines

Applying principles and standards for producing unique records

Dissection process

4 species x 3 gears x 1 flag state = **12 UUIDs**
populating the **GRSF Fishing Units "store"** ...
... among which meaningful, and possibly meaningless, combinations

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4. Pilot validation of UUIDs and release of GRSF VRE

B) experimented validation & Publication method

- SFP stocks and fisheries -

	ASSESSMENT UNIT	MANAGEMENT UNIT	FLAG COUNTRY	FISHING GEAR
1. European hake	NE Atlantic southern stock	EU 8c, 9a, 10	France	Set gillnets (anchored)
			Portugal	Bottom trawls
			Spain	Bottom trawls
				Longlines
				Set gillnets (anchored)

	BIOLOGICAL STOCK	ASSESSMENT UNIT	MANAGEMENT UNIT	FLAG COUNTRY	FISHING GEAR
2. Atlantic cod		E Georges Bank	Canada 5Zc	Canada	Bottom trawls
			US E. Georges Bank	United States	Bottom trawls
2. Atlantic cod	Georges Bank				Bottom trawls
2. Atlantic cod		Georges Bank	US W. Georges Bank	United States	Gillnets and entangling nets
					Longlines

	RESOURCE	MANAGEMENT UNIT	FLAG COUNTRY	FISHING GEAR
3. Bali sardinella	Philippines FMA 10	Philippines FMA 10		Encircling gillnets
			Philippines	Gillnets and entangling nets
				Purse seines

GRSF assessment unit

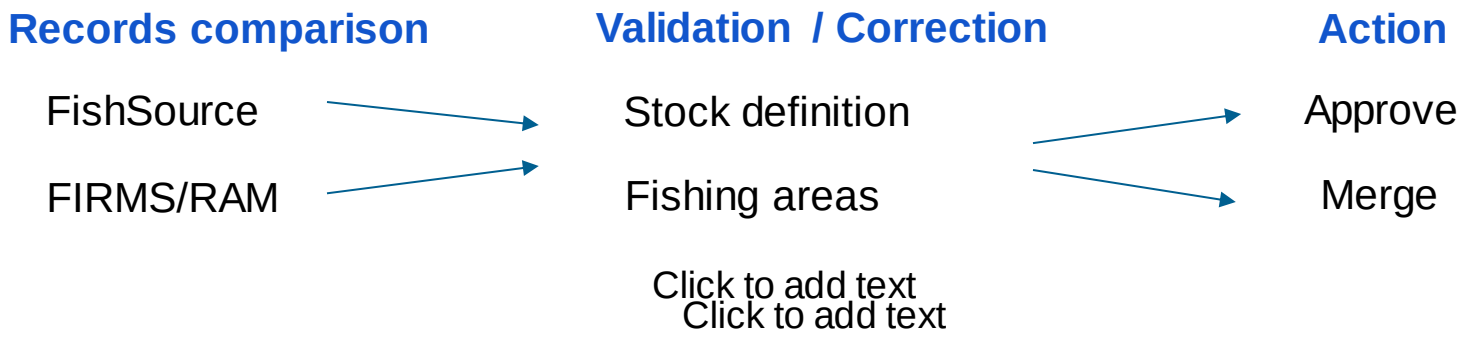
GRSF Marine Resource

GRSF Fishing Unit

4. Pilot validation of UUIDs and release of GRSF VRE

B) experimented validation & Publication method

- SFP validation process -



- Semi-manual validation: interactions between FAO and FS team
- Fishing units associated with stocks will be automatically approved after stock approving
- Validation process: leads to corrections in FishSource/FIRMS/RAM (quality control)
  - E.g. mostly assessment areas; stocks redefinitions
- Merge records: time consuming process but ensures quality in GRSF records
- Identification of new area standards to be incorporated
  - E.g. Canada Pacific Management Areas, DFO: PFMA 127
- FishSource records add Stocks /Fisheries not covered by other organizations

5. Report on testing of UUIDs

In this agenda item, we will review ...

a) Exploring the GRSF Database
   - Competency Queries
   - Web services - APIs

b) The integration of UUIDs in partners DBs

c) Use of UUIDs for business purpose
   - example of use (through APIs)

5. Report on testing of UUIDs

Competency Queries

- Competency Queries include questions that
  - Combine more than **entities** and **concepts**
  - Answer both simple and complex questions
  - Provide an answer that may contain several **fields**
  - Require **combining information from several sources** to provide an answer
  - Represent the query requirements of the **semantic data integration** of data sources

uuid	grsf_name	grsf_semantic_id	short_name	type	status	firms_code	ram_code	fishsource_code
078df83b-9428-3dad-b836-ddefa1679f0e	Nephrops norvegicus - Irish Sea (Division 27.7.a)	asfis:NEP+fao:27.7.a	Norway lobster - Eastern Irish Sea	assessment unit	approved	13442		
228fda25-563f-3d95-b13d-bd34c2edcf4b	Nephrops norvegicus - Irish Sea (Division 27.7.a)	asfis:NEP+fao:27.7.a	Norway lobster - Western Irish Sea	assessment unit	approved	13443		1173
9ec5aba1-daa8-3c0f-81bf-8271382d309c	Oncorhynchus gorbuscha - Whale Pe (District106)	asfis:PIN+unk:USA-AKSTATE-WHALEP	Pink Salmon Whale Pe (District106)	assessment unit	approved		PSALMWHALEP	
2e11c815-7737-3937-94ea-6d948831ecab	Nephrops norvegicus - Irish Sea (Division 27.7.a)	asfis:NEP+fao:27.7.a	Norway lobster - The Smalls	assessment unit	pending			1163

GRSF Geospatial Queries

1. Get geographic information (polygons) for GRSF Stocks
2. Get geographic information (polygons) for GRSF Stocks (in JSON format)
3. Get geographic information (polygons) for GRSF Fisheries
4. Get geographic information (polygons) for GRSF Fisheries (in JSON format)

GRSF Summary Queries

1. List GRSF Stock records with their original IDs
1. List GRSF Fishery records with their original IDs

8. List all Stocks records from GRSF per FAO major fishing area
9. List all Fishery records from GRSF per FAO major fishing area
10. List all Stocks records from GRSF with associated catch series
11. List all Fisheries from GRSF per EEZ

- Examples
  - List all GSRF Fishery records with the following fields Species Name / Area / Management Authority / Flag State / Fishing Gear
  - For a scientific name of a species return the fishing related activities happened in a specific water area in a given year
- Purpose
  - They can be used for: (a) **validating** and assessing the quality of a semantically integrated dataset, (b) **provision** of information to the **end users** using predefined competency questions

https://services.d4science.org/group/grsf/competency-queries

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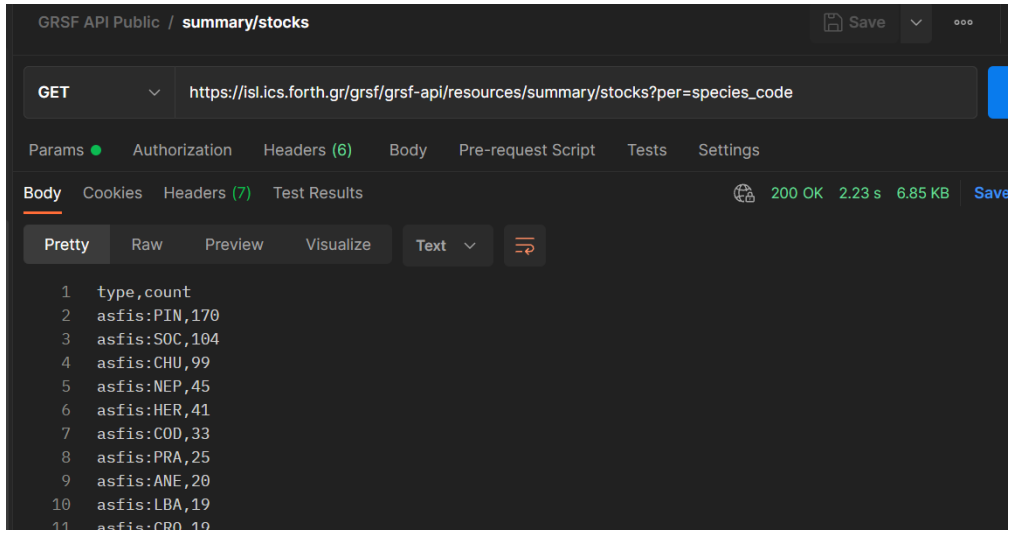
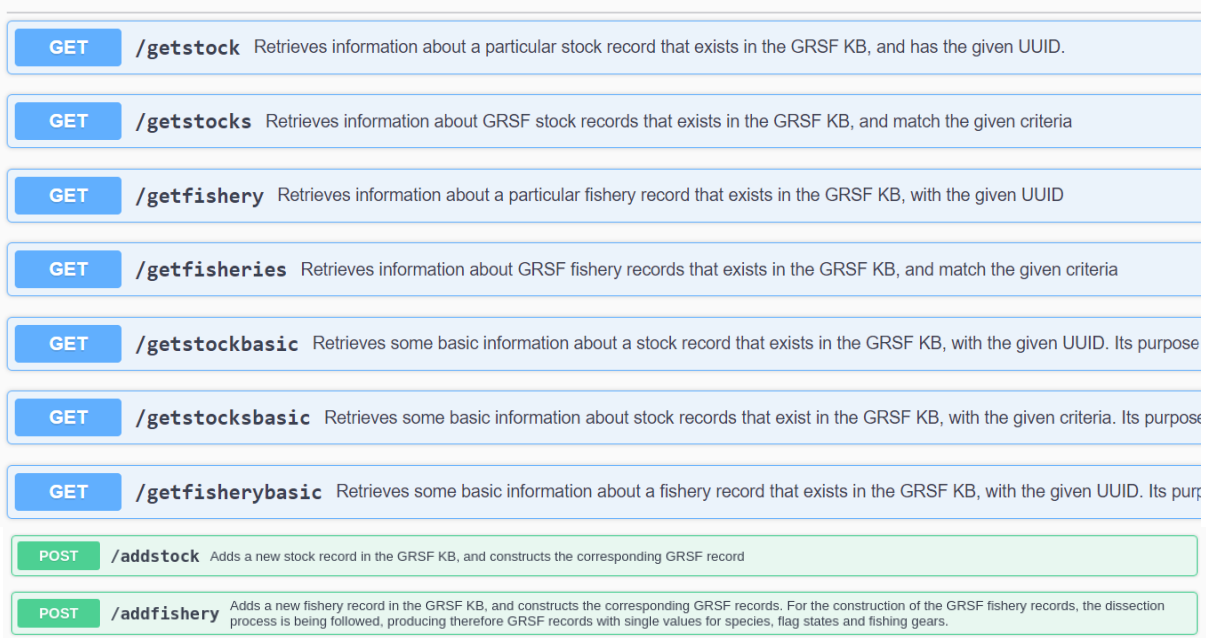
5. Report on testing of UUIDs

APIs

- GRSF API (Application Programming Interface) provides the **formal methods** for accessing GRSF Knowledge Base
- Implemented a set of different endpoint (as REST services) that can be logically divided to
  - **Insert** services: add new stock and fishery records
  - **Search** services: retrieve one or more GRSF records, or any type of information about GRSF records
  - **Count** services: count the overall number of records with respect to several criteria
  - **Summary** service: get the distribution of GRSF records with respect to several criteria





https://isl.ics.forth.gr/grsf/grsf-api/

Food and Agriculture Organization of the United Nations

5. Report on testing of UUIDs

The integration of UUIDs in partners DBs

Testing the GRSF proposed standards by integrating the new fish stock and fisheries identifiers in multiple databases for different possible utilizations

RAM Database: *UUIDs added in the RAMLDB for all the approved/archived records (974 out of 1412)*

ICES*: UUIDs are not yet enacted in ICES databases but the task has been included in the ICES Secretariat's workplan. UUIDs will be incorporated in the ICES vocabularies and then visible through Stock Assessment Graphs and the Stock Information Database. Hence, UUIDs will be visible against ICES stock keys.*

FIRMS Database: *UUIDs returned for each FIRMS record. Not yet displayed due to the ongoing upgrade of the FIGIS engine and the new FAO-NFI website*

FishSource Database: *UUIDs for approved records displayed on FishSource stock and fishery profiles*

Others: …

Partners are encouraged to give a try!

5. Report on testing of UUIDs

Use of UUIDs for business purpose

Specific use cases

- Assessing NOAA's StockSmart database to assess data coverage

- Integrating new stocks reported via SDG 14.4.1 questionnaires to stabilise national species lists, reduce reporting burdens via the integration of UUIDs (and stock identity information) in the next questionnaire, increase GRSF data coverage, investigate ways to improve GRSF area standards

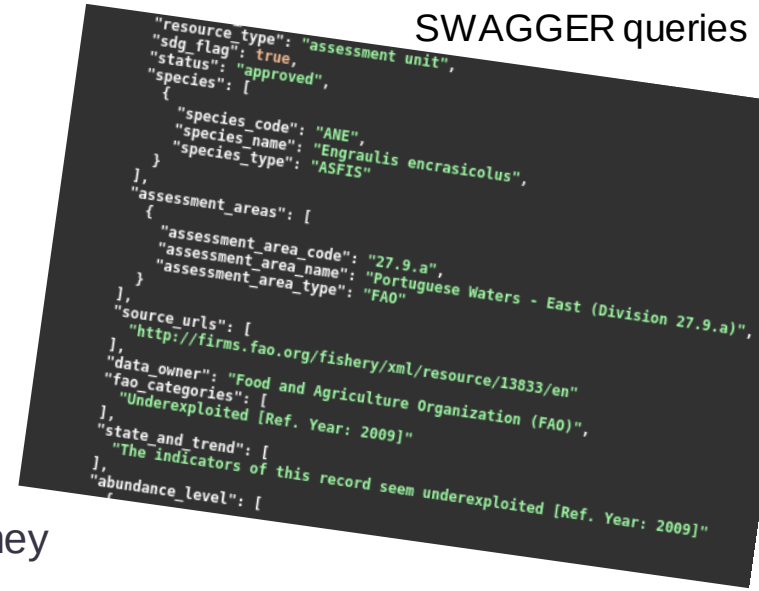
- Mapping GRSF assessment units to FAO's FishStatJ species*area stocks to increase granularity of stock information

5. Report on testing of UUIDs

Use of UUIDs for business purpose

Matching algorithm

SWAGGER queries



Semi-automated matching algorithm (Species + Area) :

Via **SWAGGER and R API**, semi-automated matching algorithm to compare current GRSF records to alternate/complementary sources of stock information and match them on the ***Species+Area***

1) **Species name verification** : Alternate source species names are first verified against ASFIS/WoRMS species list;

2) **Record extraction via API:** All GRSF records for that species are extracted via the API

3) **Match species-specific records on area codes:** Area codes used to identify **exactly-matched** records automatically, all other records examined manually to determine whether they are **partially-matched** with the area, or no match exists and they are **unique/new** records

4) **Species-based proximity scores** are given on the matching to species, e.g. for single-species exact matches = 100%, or for multi-species stock with 3 species, 2 of which are matched = 67%

5) **Area-based proximity scores** are dealt with in the knowledge base

Connection via R API

```
## connect to grsf via api
library(rapiclient)
grsf_api <- get_api(url = "https://api.swaggerhub.com/apis/ymark/grsf
operations <- get_operations(grsf_api)

## identify the areas you'd like to search, including pending records
req_sp_area<-operations$getstocks(area_code = '37',pending=TRUE)

## extract the content of the records found
req_c=httr::content(req_sp_area)

## convert to data frame
grsf_records<-toDataFrame(req_c$result)
```

Actions:

- Towards full automation with improved area standards (codes, geographic delineation)
  - Depends also on the alternate data source, e.g. SDG 14.4.1 questionnaire format allows for high variability in responses, complicating algorithm development

Food and Agriculture Organization of the United Nations

5. Report on testing of UUIDs

Use of UUIDs for business purpose

Partners are invited to provide further prospects - to be discussed under agenda item 7 (Day 2).

6. Report on the GRSF database

In this agenda item, we will review ...

a) Database coverage – the contribution of various sources

b) Inventory of fish stocks – geographic coverage

c) Content / Time dependent data – temporal coverage

d) Prospects from the integration of new data source from national SDG14.4.1 questionnaires

e) Validated content vs. Draft content – what remains to be done

f) Required improvements on standards

- Geographic resolution of records
- New concept/definitions - Traceability units

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6. Report on the GRSF database

Database coverage – the contribution of various sources

Record types	Total number				Uniquely sourced from			Jointly sourced from			
	Total	App	Arch	Pend	FIRMS	FishSource	RAM	FIRMS FishSource RAM	FIRMS RAM	FishSource RAM	FIRMS FishSource
Assessment unit	**2807**	**1519**	**72**	**1216**	589	769	1195	73	90	54	37
Marine resource	**481**	**22**	**9**	**450**	27	454	0	-	-	-	-
Stocks from source systems	3645				836	1397	1412				
Fishing unit	**12622**	**91**			8869	3753	-	-	-	-	-
Other fishery	**905**				896	9	-	-	-	-	-
Fisheries from source systems	4287				279	4008	-				

6. Report on the GRSF database

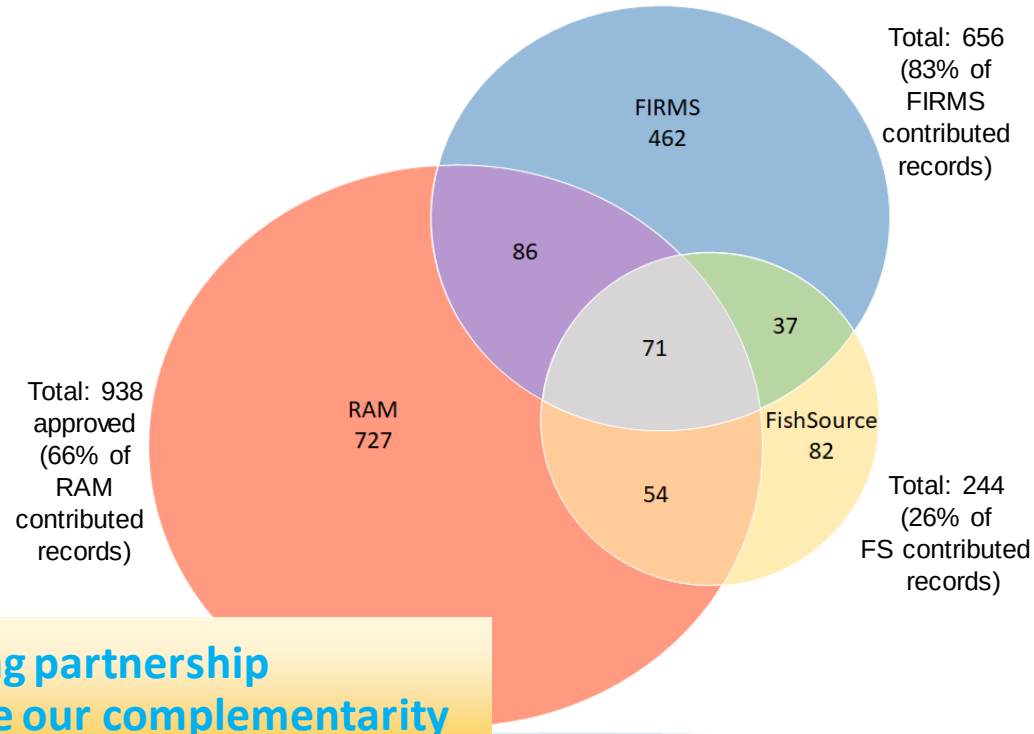
Inventory of fish stocks - Contribution of various sources to the geographic coverage

Updated 27 September 2021

Total stock records	Approved stock records with public UUIDs	Review in progress
3288	1541	1666

Number of Species
1211

Breakdown of total approved Assessment Units



Total: 656 (83% of FIRMS contributed records)

Total: 938 approved (66% of RAM contributed records)

Total: 244 (26% of FS contributed records)

The GRSF leverages the three sources in complementary ways:

- Increased number of species and fish stocks
- Increased coverage in different world areas
- Regional vs. national sources

The power of information sharing partnership
Working together we will further improve our complementarity

FIRMS

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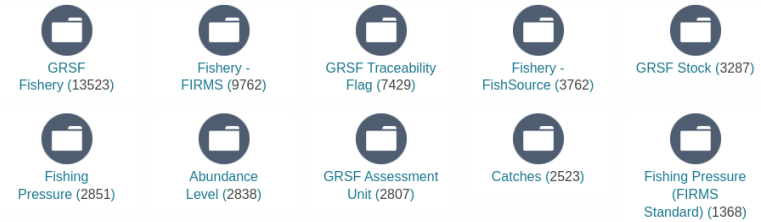
6. Report on the GRSF database



Content - Time dependent data (all records)

Time Dependent indicator – data & information	Data Provider			Number of records
	FIRMS	FishSource	RAM	
Abundance Level (FIRMS Standard) (qualitative descriptor)	✓			1368
Abundance Level (quantitative/qualitative descriptor)		✓	✓	2838
Fishing Pressure (FIRMS Standard) (qualitative descriptor)	✓			1368
Fishing Pressure (quantitative/qualitative descriptor)		✓	✓	2851
FAO Stock Status Categories (qualitative descriptor)	✓			618
Biomass (time series)	✓	✓	✓	2186
Catches (time series)	✓	✓	✓	2523
Landings (time series)	✓	✓	✓	442
Scientific advice (narrative)	✓	✓		1162
State and Trend (narrative)	✓	✓		2591

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6. Report on the GRSF database

Content - Time dependent data

Time Dependent Indicators	Description	Data Provider		
		FIRMS	FishSource	RAM
Abundance (quantitative/qualitative descriptor, time series)	Biomass time series/reference points, CPUEs, FIRMS standard abundance level	✓ ✓	✓	✓
Fishing Pressure (quantitative/qualitative descriptor)	Fishing mortality time series/reference points, Effort, FIRMS standard exploitation rate	✓ ✓	✓	✓
Stock Status Categories (qualitative descriptor, narrative)	FAO categories, FIRMS standard descriptors, State and trends, scientific advice	✓ ✓	 ✓	
Catches and Landings	Time series	✓	✓	✓
Length Frequencies	Time series			

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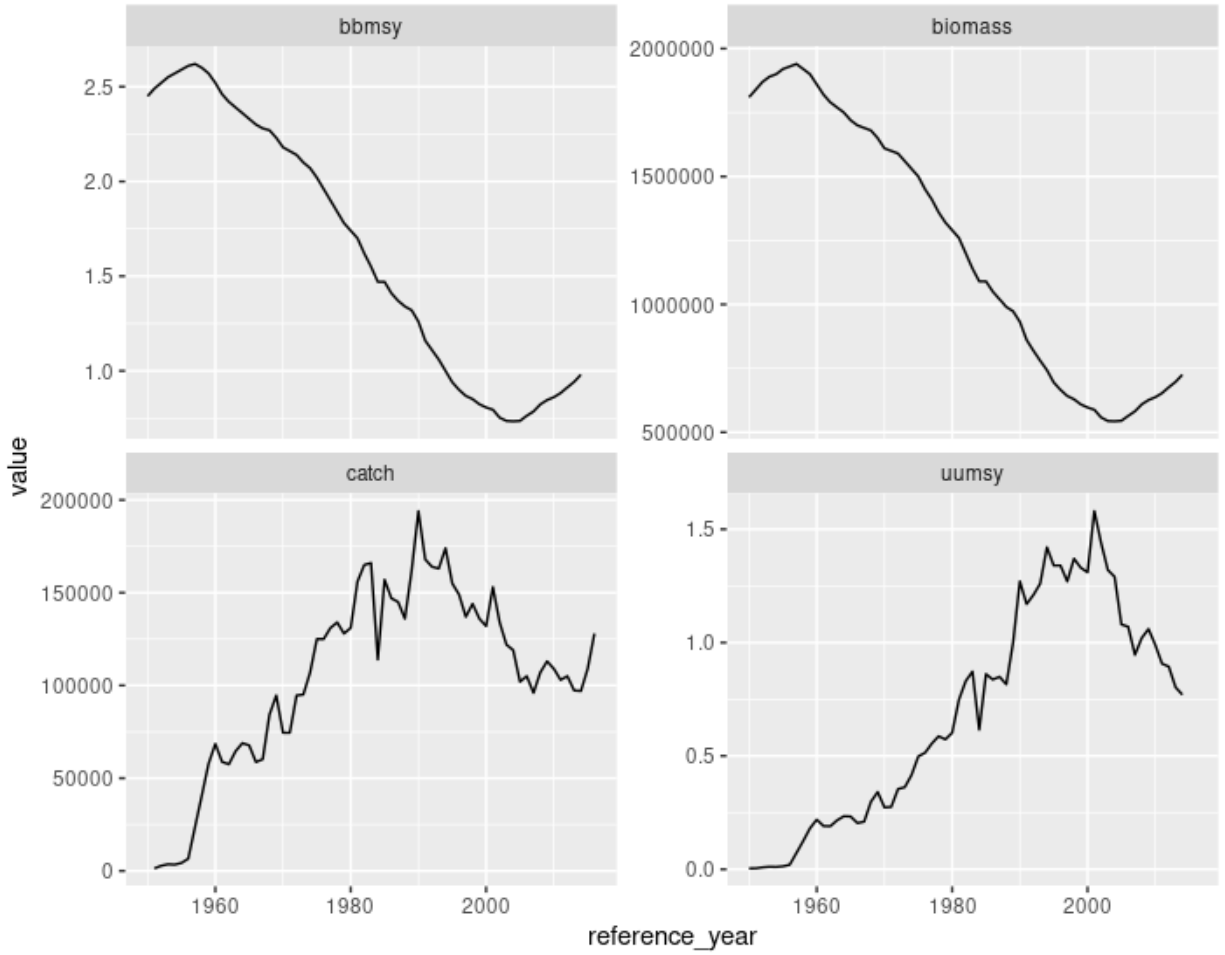
6. Report on the GRSF database

- Extract time-dependent information via the getstocks() function in R API
  - Example: Yellowfin tuna - Atlantic

```
## connect to grsf via api
library(rapiclient)
grsf_api <- get_api(url = "https://api.swaggerhub.com/apis/ymark/grsf-api/2.1.2/swagger.json")
operations <- get_operations(grsf_api)

## identify the species you'd like to search, including pending records
req_sp_area<-operations$getstocks(species_code = 'YFT',pending=TRUE)

## extract the content of the records found
req_c=httr::content(req_sp_area)

## convert to data frame
grsf_records<-toDataFrame(req_c$result)

head(grsf_records)

## select the stock uuid and extract the data
# catches
yft_catch<-get_uuid_timeseries(grsf_records$uuid[4],variable='catches')

# biomass
yft_biomass<-get_uuid_timeseries(grsf_records$uuid[4],variable='biomass')

# abundance - and select b/bmsy from available variables
yft_ab<-get_uuid_timeseries(grsf_records$uuid[4],variable='abundance_level')
yft_bbmsy<-yft_ab[which(yft_ab$unit=='BdivBmsypref'),]

# fishing pressure - and select u/umsy from available variables
yft_fp<-get_uuid_timeseries(grsf_records$uuid[4],variable='fishing_pressure')
yft_uumsy<-yft_fp[which(yft_fp$unit=='UdivUmsypref'),]
yft<-data.frame(rbind(yft_uumsy[,c('reference_year','value','data_type')],
                yft_biomass[,c('reference_year','value','data_type')],
                yft_bbmsy[,c('reference_year','value','data_type')],
                yft_catch[,c('reference_year','value','data_type')],
                yft_uumsy[,c('reference_year','value','data_type')]
                ))
yft$reference_year<-as.numeric(yft$reference_year)
yft$value<-as.numeric(yft$value)
```

```
library(ggplot2)
ggplot(yft,aes(x=reference_year,y=value))+geom_line()+facet_wrap(~data_type,scales='free_y')
```



FIRMS

6. Report on the GRSF database

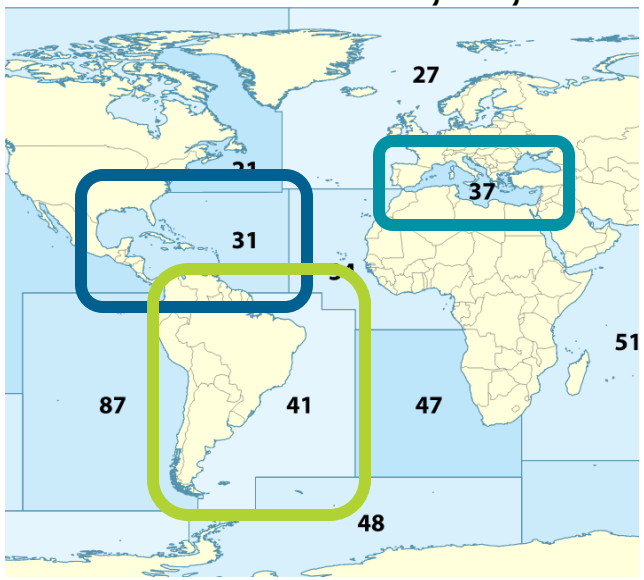
Investigating time dependent data

Mapping between GRSF and FishStatJ to support SDG 14.4.1 quality assurance and stock assessment

1) potentially increased **granularity** available in GRSF relative to FishStatJ

- GRSF records listed as assessment units, e.g. subareas, subnational levels by species or multispecies groups
- FishStatJ reports by country and FAO major area (or subarea) by species or multispecies
  - e.g., In Area 31, GRSF data have 37% more species-specific records that map to species groups in FishStatJ
  - e.g., In Area 37, GRSF has > 2x the number of UUIDs than species
  - e.g., 302 UUIDs for 212 species across the three areas

Pilot areas 31, 37, 41



2) time-dependent data available for GRSF stocks can come in addition to FishStatJ. We found 226/302 UUIDs have some time-dependent data

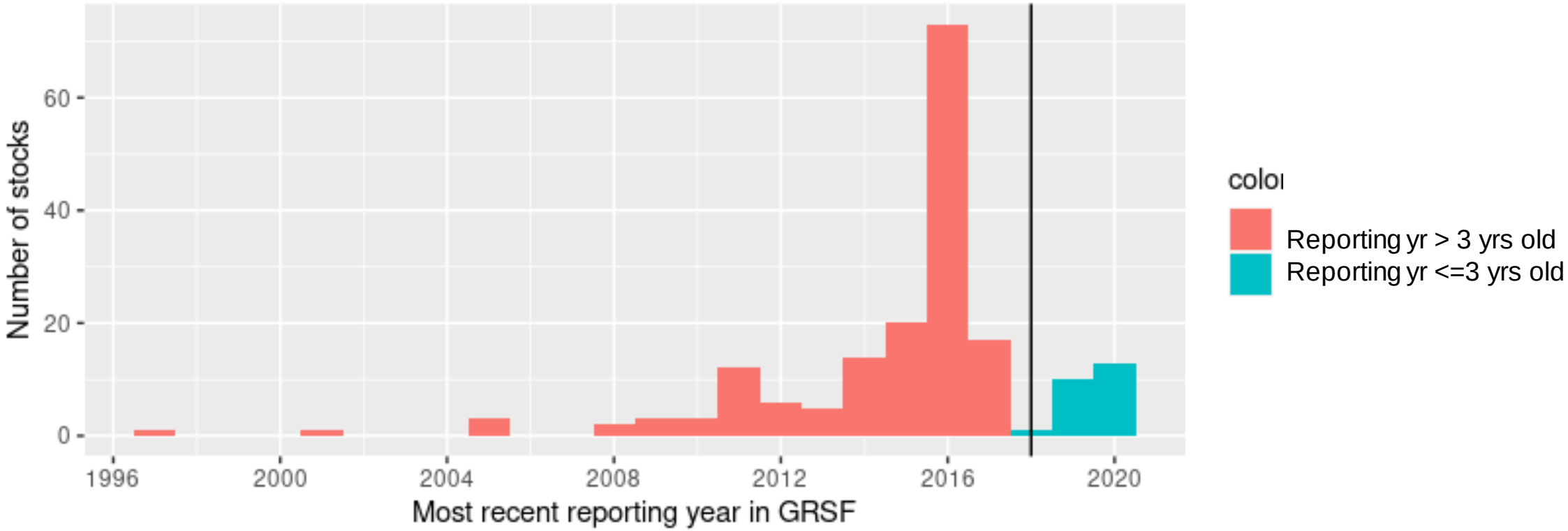
GRSF time-dependent data assessed for :

- **timeliness** (data within last 5 years)
- **duration** of time series (>25 years of data)

6. Report on the GRSF database

Content / time dependent data – temporal coverage "Reporting Year" (for 226 UUIDs in Areas 31, 37, and 41)

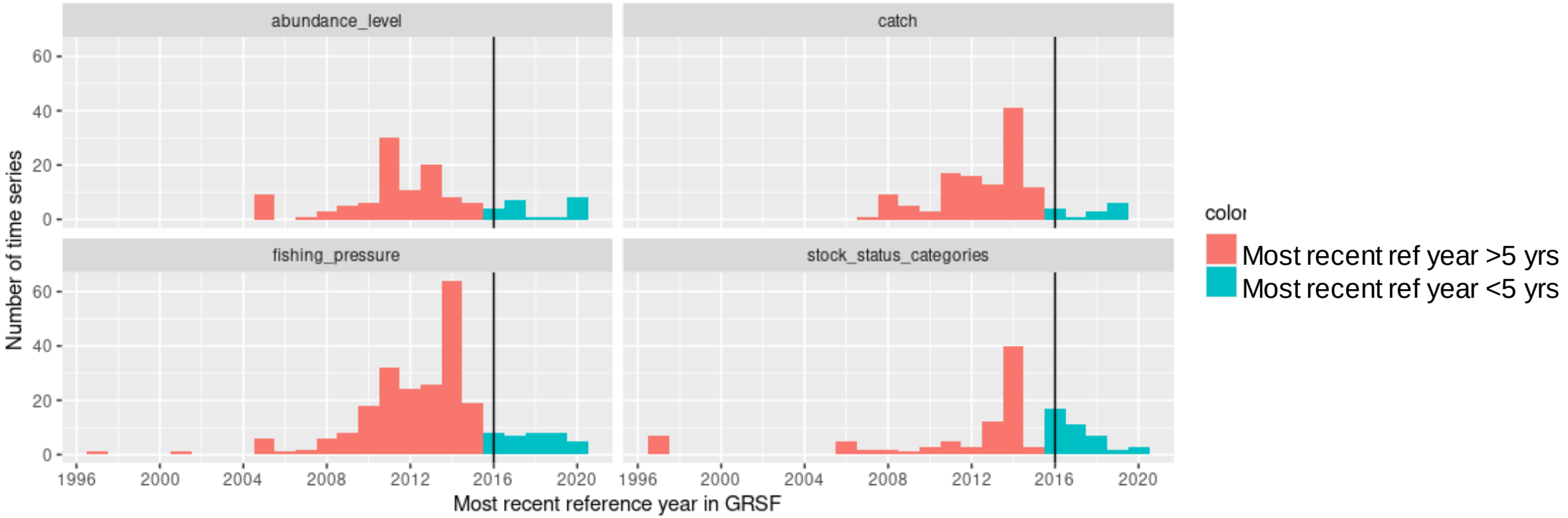
10% of stocks with most recent reporting year **in last 3 years** (n=24)



6. Report on the GRSF database

Content / time dependent data – temporal coverage "Reference Year" (for 662 unique time series in Areas 31, 37, and 41)

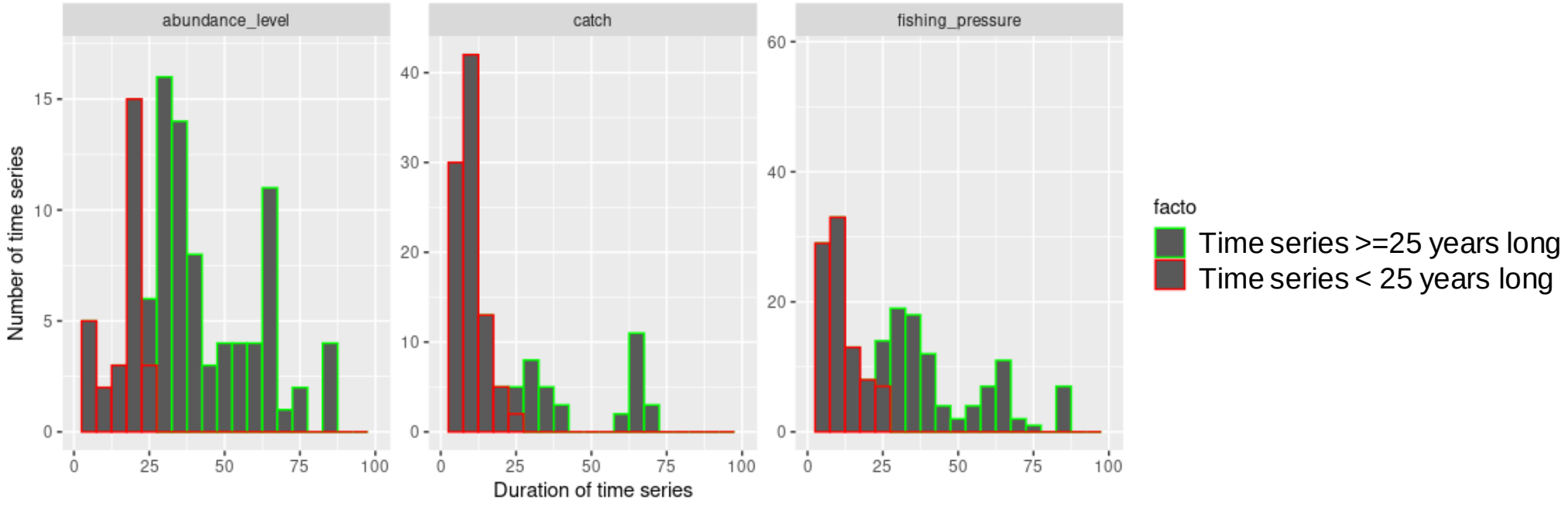
- Plots indicate most recent reference year of time-dependent data
  - Between 11-17% of stocks with time series data, and 32% with stock status categories **within last 5 years**
- Timely data important to support quality assurance and stock assessment



6. Report on the GRSF database

Content / time dependent data – time series duration (for 622 unique time series in Areas 31, 37, and 41)

- Plots indicate the duration of time series for the different data types. Durations of ~25 years can be useful
- Time series >=25 years long : 62% abundance level, 26% catch, 40% fishing pressure
- Only one stock status category value given per stock



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6. Report on the GRSF database

Prospects from the integration of new data source from national SDG14.4.1 questionnaires

14.1 14.2 14.3 **14.4** 14.5 14.6 14.7 14.a 14.b 14.c

Target 14.4

By 2020, effectively **regulate harvesting** and **end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices** and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.

14.4.1 **Proportion of fish stocks within biologically sustainable levels**

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
Institutional set-up for reporting and identification of sources of stock status.	Set-up of reference list of stocks.	Categorization of status for stocks of the reference list, and indicator calculation method.	Reporting to FAO through questionnaire.	Quality assurance review, and feedback to the country.	Reporting to the United Nations Statistics Division (UNSD).
At country level				At FAO level	

TARGET 14·4

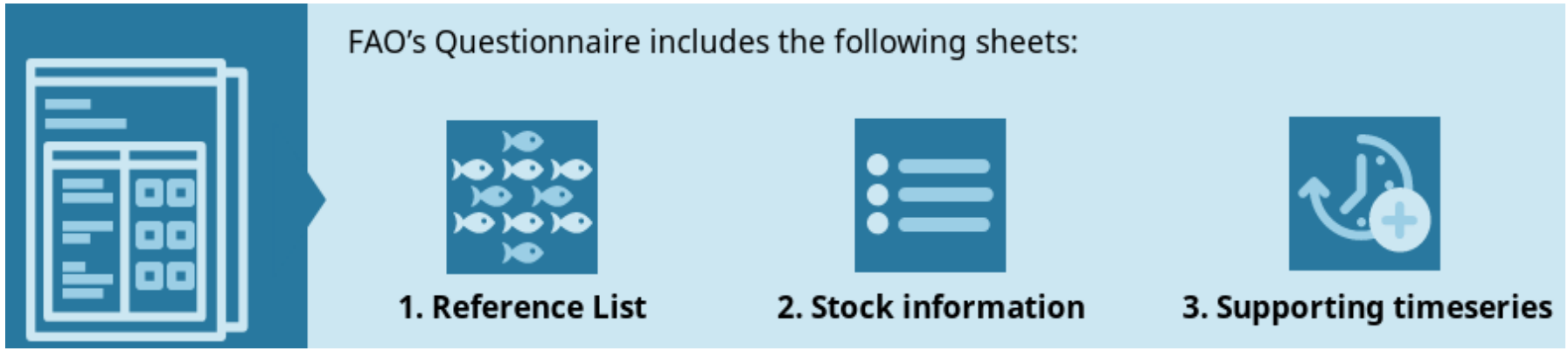
SUSTAINABLE FISHING

SUSTAINABLE DEVELOPMENT GOALS FIRMS

Food and Agriculture Organization of the United Nations

6. Report on the GRSF database

Prospects from the integration of new data source from national SDG14.4.1 questionnaires



- GRSF will integrate the reference lists of stocks proposed by countries, and new stocks will be assigned a UUID to collate new and existing data via semi-automated workflow
- First-level quality assurance of questionnaires
  - Verify species, area, stock type
  - Facilitate reviews and updates
- UUIDs will be integrated into next questionnaires and distributed to countries
  - Stabilise countries' reference list of stocks; and
  - Streamline country reporting

TARGET 14·4
SUSTAINABLE FISHING

Food and Agriculture Organization of the United Nations

6. Report on the GRSF database

Prospects from the integration of new data source from national SDG14.4.1 questionnaires

Semi-automated workflow to align, validate, and integrate SDG stocks into GRSF

- A check that SDG questionnaires include the required mandatory fields for inclusion in GRSF
  - Also works as a quality-assurance check of SDG questionnaires
- Application of the matching algorithm to compare SDG stocks to current GRSF records to identify existing and new stocks;
  - Potential role in validation of stocks submitted by countries in FIRMS partners' competency areas
- An alignment of the new SDG stock information for their submission to GRSF;
  - Towards publication of new stock identities in GRSF (LOA with FORTH)
- Integrate UUIDs (and stock identity info) into country questionnaires prior to dispatch, reducing reporting burden, stabilizing reference list of stocks

Dependencies:

Revision of SDG 14.4.1 questionnaire

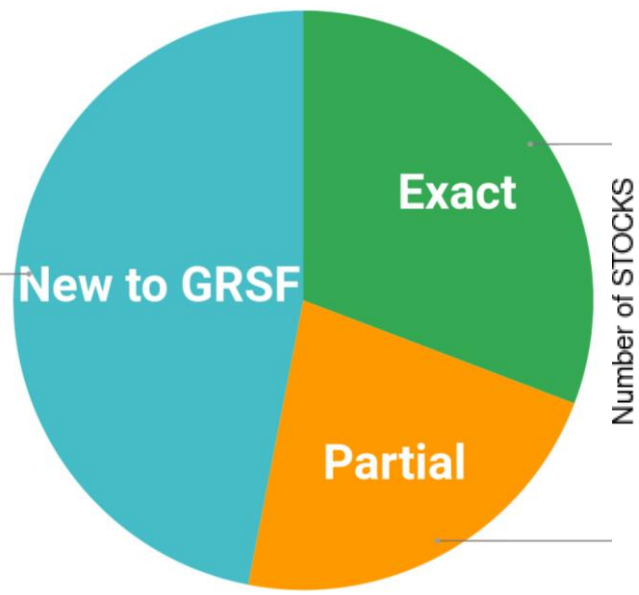
TARGET 14·4
SUSTAINABLE FISHING

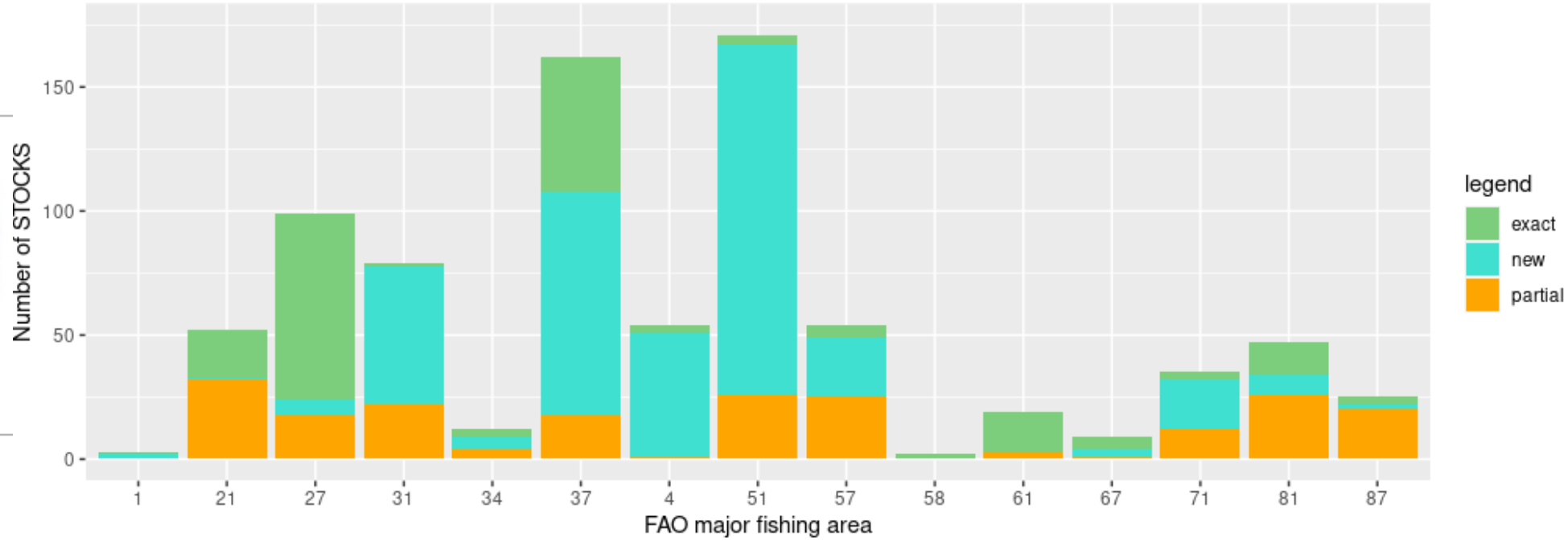
6. Report on the GRSF database

Prospects from the integration of new data source from national SDG14.4.1 questionnaires

- While GRSF coverage is good, SDG stocks can add important number of stocks and records
- GRSF will grow with new records from countries, available for consideration in the global indicator

SDG stocks mapped to GRSF for 36 of the higher-quality questionnaires, i.e. 65% of stocks reported via questionnaires





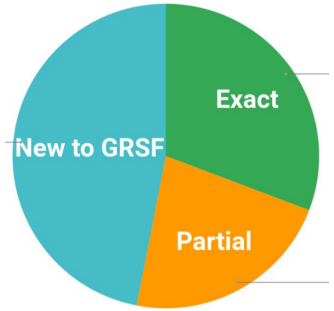
6. Report on the GRSF database

Prospects from the integration of new data source from national SDG14.4.1 questionnaires

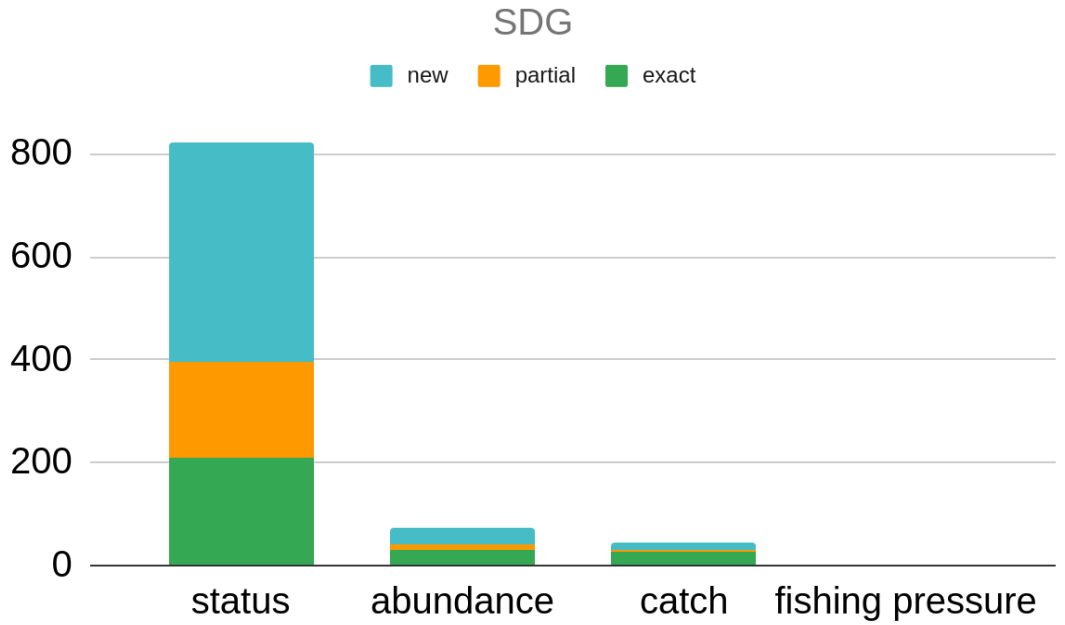
Integration of UUIDs in Questionnaires and promotion of their use in national databases

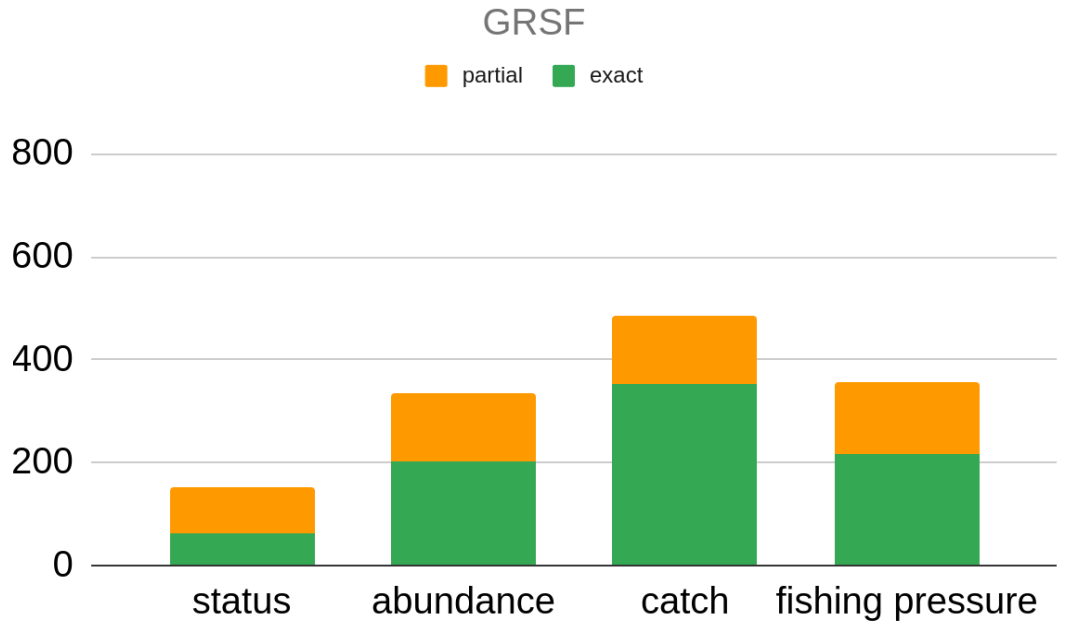
- Collate stock and time-dependent data from diverse sources
- Data are strictly for FAO internal use, unless authorised by countries

SDG Stock identities mapped to GRSF



Time-dependent data reported by countries for SDG stocks and data already available in GRSF for mapped stocks





6. Report on the GRSF database

Validated content vs. Draft content – what remains to be done

As of today:

- **3288** stock records
- Approved: **1541**
- Archived: **81**
- Pending review: **1666**

- **13 523** fishery records in the fishing units "store"
- Pilot approvals: **91**

FAO 3Alpha	Scientific Name	DB source	Evaluation
ABS	Penaeus aztecus	FIRMS, FishSource	CORRECT
ABS	Farfantepenaeus aztecus	RAM	WRONG
ALK	Theragra chalcogramma	RAM	WRONG
ALK	Gadus chalcogrammus	FishSource	CORRECT
OJE	Uroteuthis edulis	RAM	CORRECT
OJE	Uroteuthis (Photololigo) edulis	FishSource	WRONG

Examples of needed manual checks:

- Records with different species names (synonyms, invalid names)
- Records with unknown area codes
- Records referring to the same area but described with different area standards (e.g. FAO area codes vs. GFCM GSA codes)
- Records with specific area definition in the stock name but with inadequate area code (e.g. Gulf of Mexico vs. FAO Area 31)
- ….

Makaira nigricans - Atlantic

Short Name: Blue marlin - Atlantic
GRSF Semantic identifier: asfis:BUM+iccat:BUM_ATL
Record URL: https://data.d4science.org/ctlg/GRSF_Admin/e9d96077-6cb7-34c2-bf06-dc04e25dad89

Stock Identity

Field	Value
Assessment Area	Code: BUM_ATL, System: iccat, Name: Atlantic
Connected Record	No Connected Records
Database Source	RAM FIRMS
GRSF Semantic identifier	asfis:BUM+iccat:BUM_ATL
GRSF Type	Assessment Unit
Short Name	Blue marlin - Atlantic
Similar GRSF Record	No Similar Records
Species	Code: BUM, Classification System: ASFIS, Scientific Name: Makaira nigricans
Stock Name	Makaira nigricans - Atlantic

Source	Area code
FIRMS	Code: BUM_ATL, System: iccat, Name: Atlantic
RAM	Code: multinational-ICCAT-ATL, System: Unknown, Name: Atlantic Ocean

6. Report on the GRSF database

Validated content vs. Draft content – what remains to be done
Illustration – the USA StockSMART case study

Objective: Compare NOAA's StockSMART content to GRSF (StockSMART is the source for the US SDG14.4.1 indicator)

Expectations: StockSMART and RAM content would be similar and integrated into GRSF

Medium term: USA integrates GRSF UUIDs in their StockSMART database

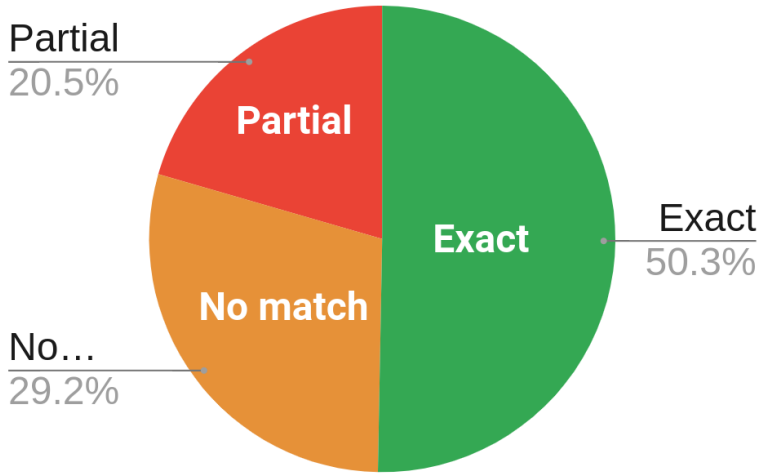
Result:

Partial matches due to ambiguous geographic referencing

- **StockSMART geographic boundaries are not defined/delineated**
- GRSF bounding boxes can show errors
- Monitoring evolution evident in GRSF

No match due to

- Unfinished merging process in the GRSF database;
- **StockSmart multispp "complexes" ambiguous in species composition; and**
- **In a stage of transition of coastal stocks in StockSMART to federal database for uptake via RAI**

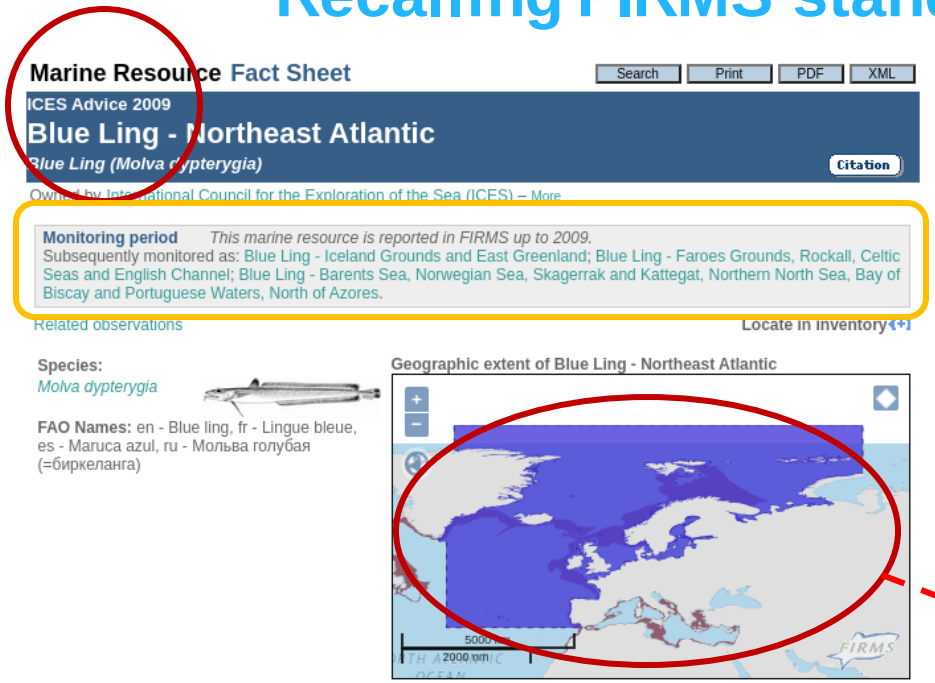


Action:

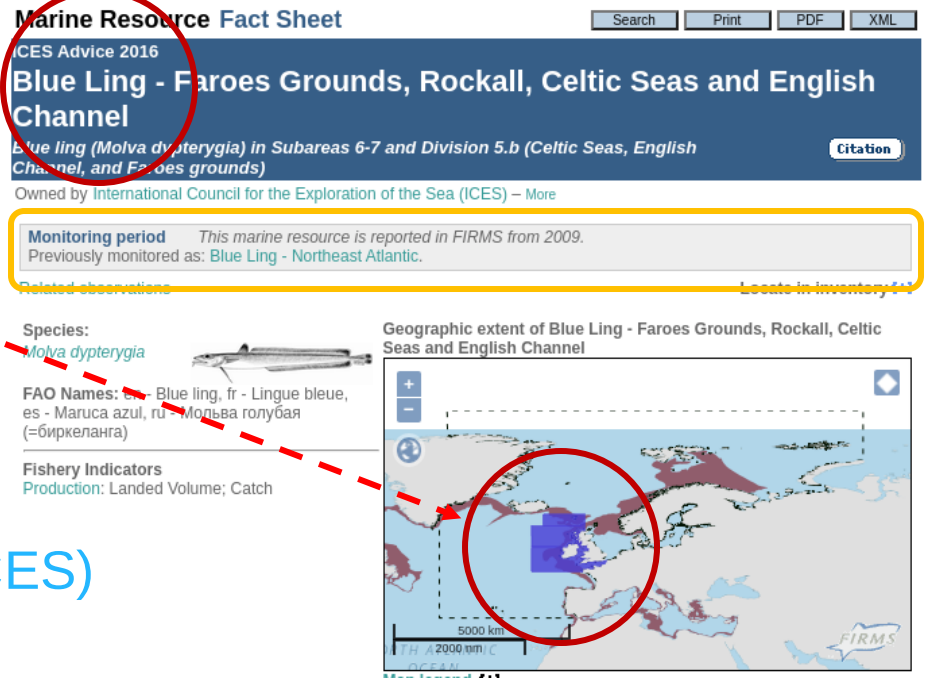
- Clarify geographic referencing standards in GRSF
- **Verify and include USA State-managed stocks via the StockSMART website**

6. Report on the GRSF database

Recalling FIRMS standard for Stock monitoring evolution



Short Name: Blue Ling - Northeast Atlantic
GRSF Semantic identifier: asfis:BLI+fao:27
Record URL: http://data.d4science.org/ctlg/GRSF/8eafcc2c-7aa0-30ac-9e64-ec6d91c88130



Short Name: Blue Ling - Faroes Grounds, Rockall and Celtic shelf
GRSF Semantic identifier: asfis:BLI+fao:27.5.b;fao:27.6;fao:27.7
Record URL: http://data.d4science.org/ctlg/GRSF/71281a46-4e50-3016-9cd5-55c935d1ad5a

In the GRSF, the stocks which are no longer monitored are "**Archived**". The UUIDs of those records persist but they are flagged accordingly.

Example of Stock monitoring evolution (ICES)

6. Report on the GRSF database

Required improvements on standards - geographic resolution of records

Example of lack of area standards:

Mexico Gulf of California shrimp:

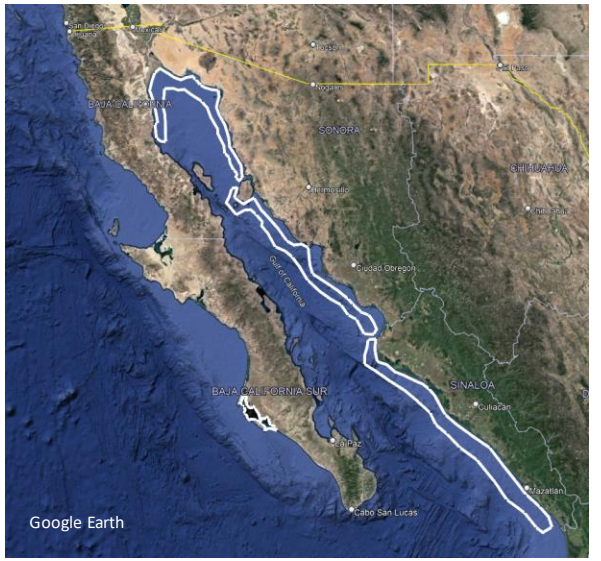
- Three different species, assessed by state
- Blue shrimp: 4 AUs: Sonora, Sinaloa-Nayarit, Upper GoC, Bahía Magdalena

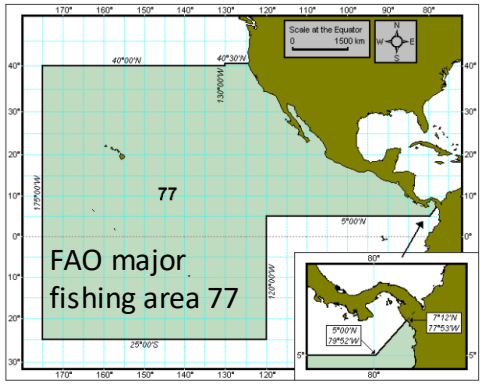
Partial potential solution:

- Similar to EEZ which defines regional/state waters by ISO 3166 alpha-3 country code
- ISO 3166-2 defines subdivision codes, e.g., MX-SON, MX-SIN, which could be used to define state waters

Full solution: locating and compiling nationally/regionally defined areas!

- In FishSource, all were defined as within “FAO 77”
- Defining uniqueness by areas is setting a higher standard





6. Report on the GRSF database

Required improvements on standards - geographic resolution of records

Contrasting case studies on area standards:

Objective: Improving assessment area definitions of SDG 14.4.1 stocks (and GRSF)

Background: Current questionnaire requires that countries report on whether their stocks are national or shared, and the FAO Major Fishing Area / subarea of the stock

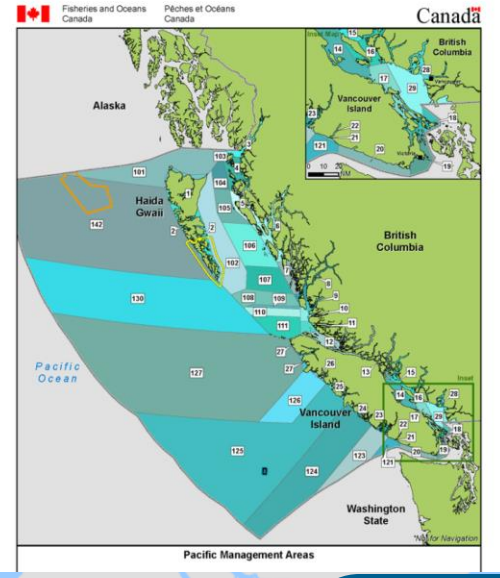
Contrasting case study: Large EEZs spanning multiple FAO major fishing areas

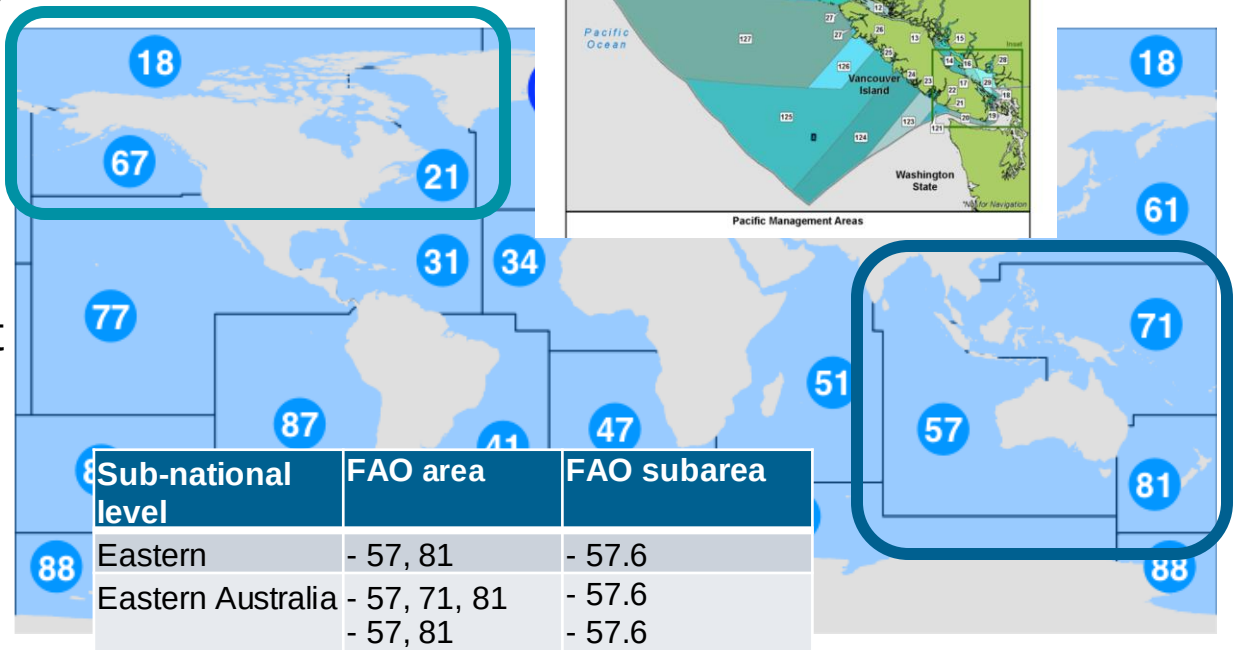
Australia – "Sub-national" assessment units, often without clear geographical delineations

- Stocks within the area overlap with FAO sub/areas in a variety of ways

Canada – 46 unique unambiguous assessment units

- Delineated by species/organism and area codes
- Many converted to shapefile





Sub-national level	FAO area	FAO subarea
Eastern	- 57, 81	- 57.6
Eastern Australia	- 57, 71, 81 - 57, 81 - 71, 81 - 57, 71, 81	- 57.6 - 57.6 - - 57.5.1, 57.5.2

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6. Report on the GRSF database

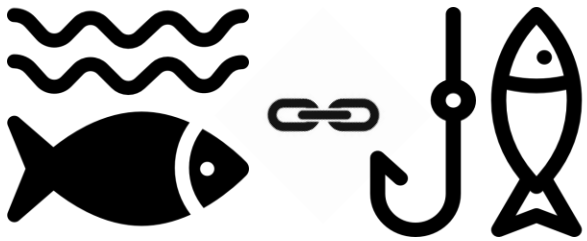
Validated content vs. Draft content – what remains to be done

Repository of fishing units

- **A repository of fishing units** with identifiers ready to be tested by stakeholders involved in traceability (SFP for action), in particular those records qualified as traceability units (connected stocks and fisheries records).

Fishing Units "Store"	Number of Species	Traceability Units (FishSource, in progress)
12622	973	3713

Updated 8 June 2021



6. Report on the GRSF database

Required improvements on standards – New concept/definitions - Traceability units

Seafood industry actively requiring an ID to identify fisheries:

- Identification of their sources throughout supply chain
- Support evaluations of sustainability

To meet this requirement, **3 main needs** in relation to fishing units:

1. Fishery linked to a single stock record
2. Define management units via "management or reporting areas" instead of "fishing areas"
3. Resolve how to identify the Marine Resource type of Stock record - where no assessment is conducted

The proposed **Traceability Unit** semantic ID is structured as follows:

<Species> + <Assessment Area(s)> + <Management or Reporting Area(s)> + <Management Authority(ies)> + <Gear type> + <Flag State>

Example of a semantic ID:

asfis:**HAD** + FAO: **27.4, 27.6.a, 27.3.a.20** + eu: **HAD/5BC6A** + authority: int:**EC, NEAFC** + isscfg:**OTB** + iso3:**ESP**

6. Report on the GRSF database

Recommended actions regarding the GRSF database

- Continue the work on the integration of SDG14.4.1 national Reference lists of stocks in GRSF, towards publishing of the UUIDs
  - FIRMS RFB Partners to advise on their possible interest to be involved in the GRSF validation workflow
- Increase geographic resolution, and develop a GRSF repository of assessment areas with the required metadata, and clear delineations (polygons in preference, bounding box)
  - Upload SFP polygons in GRSF and replace bounding boxes where possible
  - Implement as GIS layers the forthcoming CWP standard for national jurisdictions, and develop a policy for their use and display
  - Identify and upload national layers of management units for priority countries
- Develop standard ways and conventions to cope with the rapid changing nature of national layers
  - e.g. via revisions to SDG 14.4.1 questionnaires; promoting GRSF in concerned countries; propose turn-arounds when new layers have not been uploaded
- Review the proposed standard for Traceability units along with other related FIRMS standard concepts
  - Fishing unit
  - Management unit
- Develop a conceptual framework:
  - Fishing units "store"
  - Validation method for Traceability units

END of DAY1

Thank you ▪ Merci
Благодарю ▪ ¡Muchas gracias!
謝謝 ▪ شكرا

FIRMS-Secretariat@fao.org

7. Day1 Wrap-up

The TWG was presented **status of the GRSF system and database**, with contributions testifying:

- A robust and well-functioning system periodically refreshed offering a variety of access and dissemination features, ranging from a simple Map viewer for the general public, through to competency queries for pre-defined extractions, and web-based services (APIs) for advanced analyses
- A closely-controlled and monitored validation mechanism for Stocks Identifiers which aims at ensuring the quality and uniqueness of records, compliance with agreed standards or conventions
- The GRSF infrastructure and the UUIDs offer interoperability for data exchanges and mutual enrichments with other databases (federation of systems)
- With over 1500 stocks approved, and over 1600 still pending approval, GRSF can be considered a one-stop-shop to access the World's unique list of stocks and stock status data and information, noting:

  Stocks in GRSF have operational-level granularity

  Geographic coverage, presently:
  - The oceans and seas around Europe, Africa, North and South America, Australia and New Zealand are well covered
  - South Asia, South-East Asia, and the Pacific are not so well covered

  Content and temporal coverage of the various indicators supporting stock status, presently:
  - Time series of 25 years constitute a strong feature of GRSF
  - Recent data of less than 5 years constitute a weaker feature of GRSF

- The SDG14.4.1 national questionnaires represents a great additional resource which can significantly increase GRSF Geographic / Stocks / and Stocks status coverage.
  - Applying UUIDs for SDG14.4.1 sourced stocks enhances Quality Assurance contributing to stability of national reference stocks list, and to reduce the validation burden.
  - SDG 14.4.1 Data dissemination policy: only UUIDs and key identity information will be published, while content/time dependent data remains for confidential use by FAO unless otherwise agreed by countries.
- Likewise for Stocks, a controlled-process prevails for the generation of a very significant "store" of over 12000 Fishing units.

7. Day1 Wrap-up

In terms of steps that the TWG considered for **further enhancement** of GRSF:

- Considering the respective strengths and weaknesses of GRSF and FishStat regarding coverage, granularity and timeliness, the TWG identified benefits of combining FishStat and GRSF records for global stock status analysis.
- Regarding the GRSF in support of Traceability, the need for a refined and unambiguous concept of "Traceability unit" (TU) was presented to the TWG, with "fishing area" broken down between "Assessment area" and "Management area". The TWG supports further elaboration of this new concept, noting:
  - A workflow generating TUs can build on the existing GRSF data model (Assessment Units and Fishing units), while validation of TUs (including the new Management area field) will be performed by traceability business partners
  - Technical recommendation is made to review this new TU concept in conjunction with the forthcoming revision of the SDG questionnaire.
- GRSF faces the lack of globally accepted geographic standards for the stocks identified at national or sub-national levels, in particular concerning countries with extended EEZs or with more advanced management strategies.
- The Stocks pending approval, the integration of national stocks from SDG questionnaires, and the proposed traceability units, will greatly benefit from developing approaches and standards for managing increased resolution of geospatial data.

Food and Agriculture Organization of the United Nations

7. Data use and Partners' perspectives on the GRSF

Agenda item #7

In this agenda item, we will have open discussion articulated on issues

o what can GRSF contribute to SDG 14.4.1 reporting / dissemination
o what can GRSF contribute to Traceability
o what can GRSF contribute to Partners' work
o what user access policy for UUIDs / for Content
o what role for Partners, according to their mandate
o any role for actors outside FIRMS partners

We would like to hear participants e.g.

- About your perceived value of GRSF / potential issues
- Ideas for use and running pilots / testing in the field
- Suggestions for coordinating inputs and fostering support from other stakeholders
- Contributing investigating possible FishStat - GRSF relations
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Contributions are proposed as follows:

a) University of Washington
b) FAO Assessment Team
c) Fisheries Partnerships
d) FAO Value Chains Team
e) FAO Information and knowledge management Team

Food and Agriculture Organization of the United Nations

7. Data use and Partners' perspectives on the GRSF

A) University of Washington - RAM Legacy Stock Assessment Database

- The work on the UUIDs is very instrumental in revealing that FIRMS-FishSource-RAMLDB are mostly **complementing** each other. The GRSF is expected to fill the gaps and grow more toward a (greater) global **coverage**.
- With improved **geospatial** information, the GRSF can be **linked** to other potential **databases**, for example to help responding to research questions. E.g., there might be some potential to show how the FAO landings database, as well as the Ex-Vessel price database by species and region, could be linked to the GRSF stock UUIDs (although with some ambiguity).
- Once the work on polygon definitions is improved, you can start to open to Climate databases, MPAs and other **geospatial DBs**. There's value to this polygons approach.
- Perspectives for the **RAMLDB**: a principal investigator is available together with a database administrator. At the moment the RAMLD is limited in growing capacity, however QA/QC checks are in place and the database will be kept **updated**.
- Potentially interested by the joint venture to cover better and in complementarity ways with other DB resources.
- The UW / RAMLDB is glad to re-affirm the **commitments** of participation in GRSF work.

7. Data use and Partners' perspectives on the GRSF

B) FAO Assessment Team - Data Workflow between FAO Data and Assessment Teams

Currently available in GRSF

FAO Data Management (GRSF)

- Catch
- Abundance (Biomass, Status)
- Fishing pressure

Recommended

- CPUE
- Effort
- Age/length composition

Data archive, dissemination

FAO Stock Status Classification

SOFIA Indicators

Advantages of GRSF in support of Indicators

- single, harmonized, validated data source
- data easily accessible via APIs and Competency Queries
- increased granularity (assessment units vs. species*area)

Weaknesses of GRSF in support of indicators

- timeliness of the data (>5 years old)
- few data required for data-moderate analyses (CPUE, effort, age/length)

7. Data use and Partners' perspectives on the GRSF

C) Sustainable Fishery Partnership (SFP) - FishSource Database

- See presentation prepared by SFP

7. Data use and Partners' perspectives on the GRSF

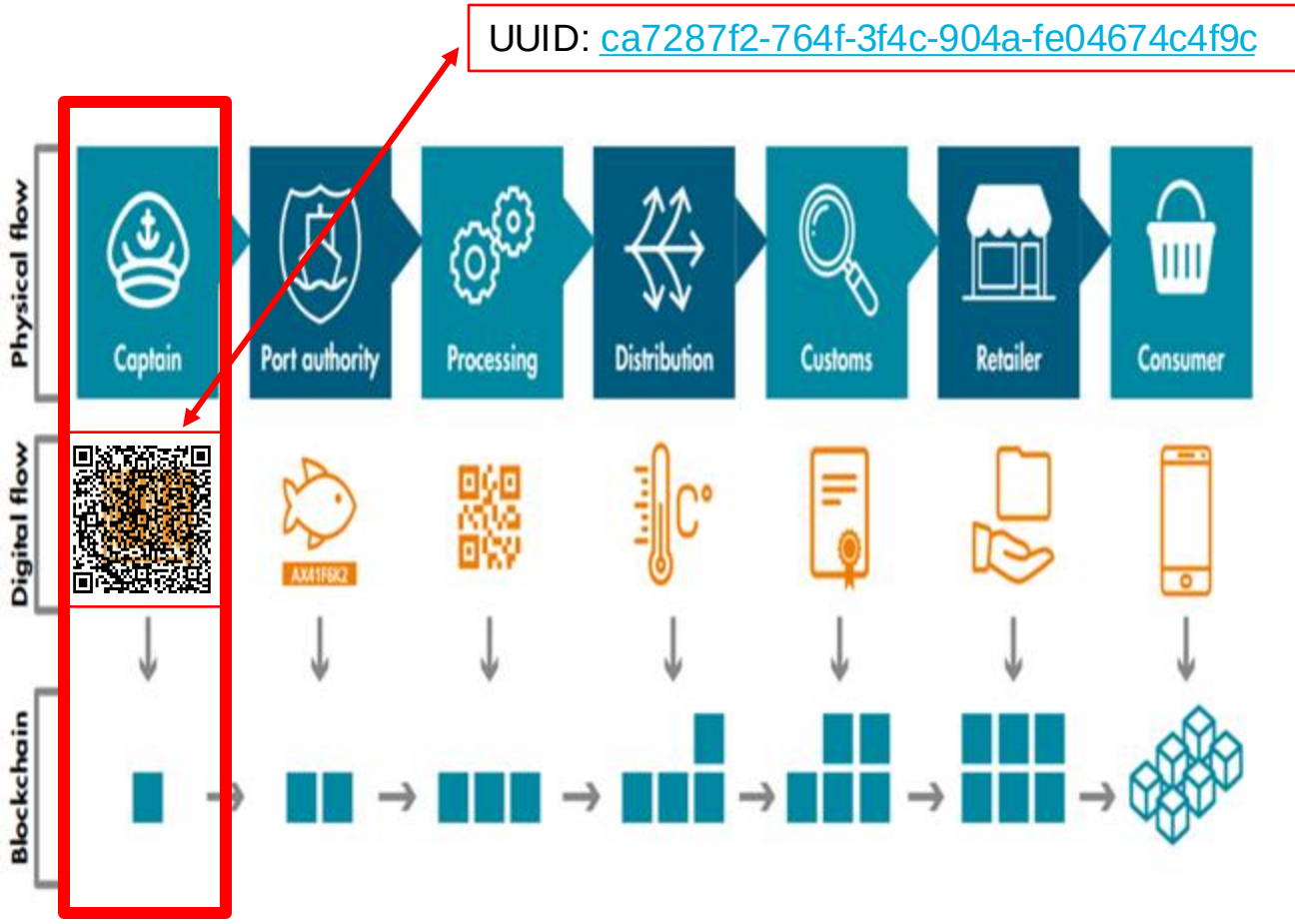
D) FAO Value Chains Team

Development of end-to-end traceability guidance document

- Inclusion of the stock and fishery name/identifier (per the GRSF) as a Key Data Element (KDE) in all tracea bility systems is to be considered for use as connectors to scientific information on fisheries and exploited stocks.

Recommendations from online public consultation:

- Potential use of standards based on existing initiatives for the purposes of the GRSF deserves to be further explored. GRSF related KDEs to be developed with more details in the next iteration.



7. Data use and Partners' perspectives on the GRSF

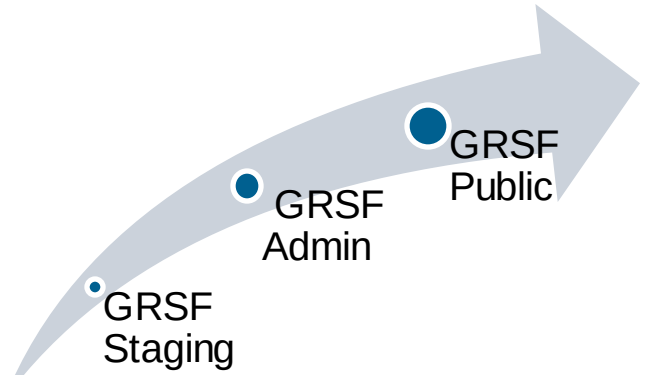
E) Perspective by the FAO Information and knowledge management Team

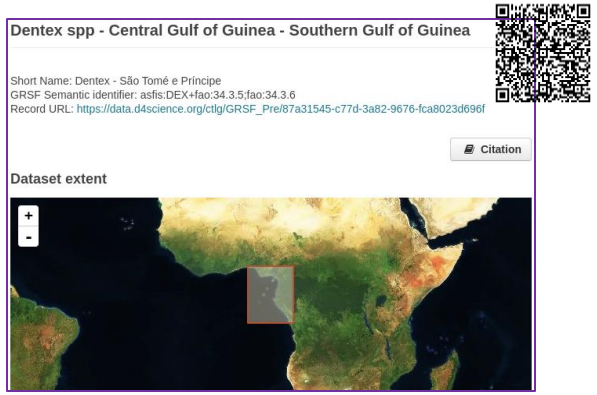
The GRSF is updated and administered by authorized users with different level of access

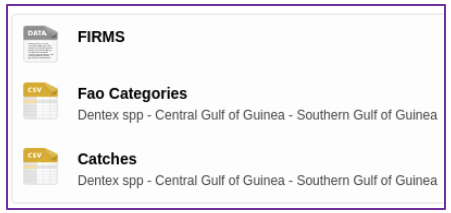
GRSF will publish the identity of approved stocks and fishery records (UUIDs). Published UUIDs enable FIRMS Partners and other stakeholders to operate their business with enhanced interoperability among their databases

Associated data will be under restricted access – at least initially - thus ensuring FAO disseminates stock status analysis through a single SOFIA channel

FIRMS partners can access GRSF data; their intended use of GRSF data should be presented and approved by FIRMS SC







UUID for public use

Data in support of SOFIA

7. Data use and Partners' perspectives on the GRSF

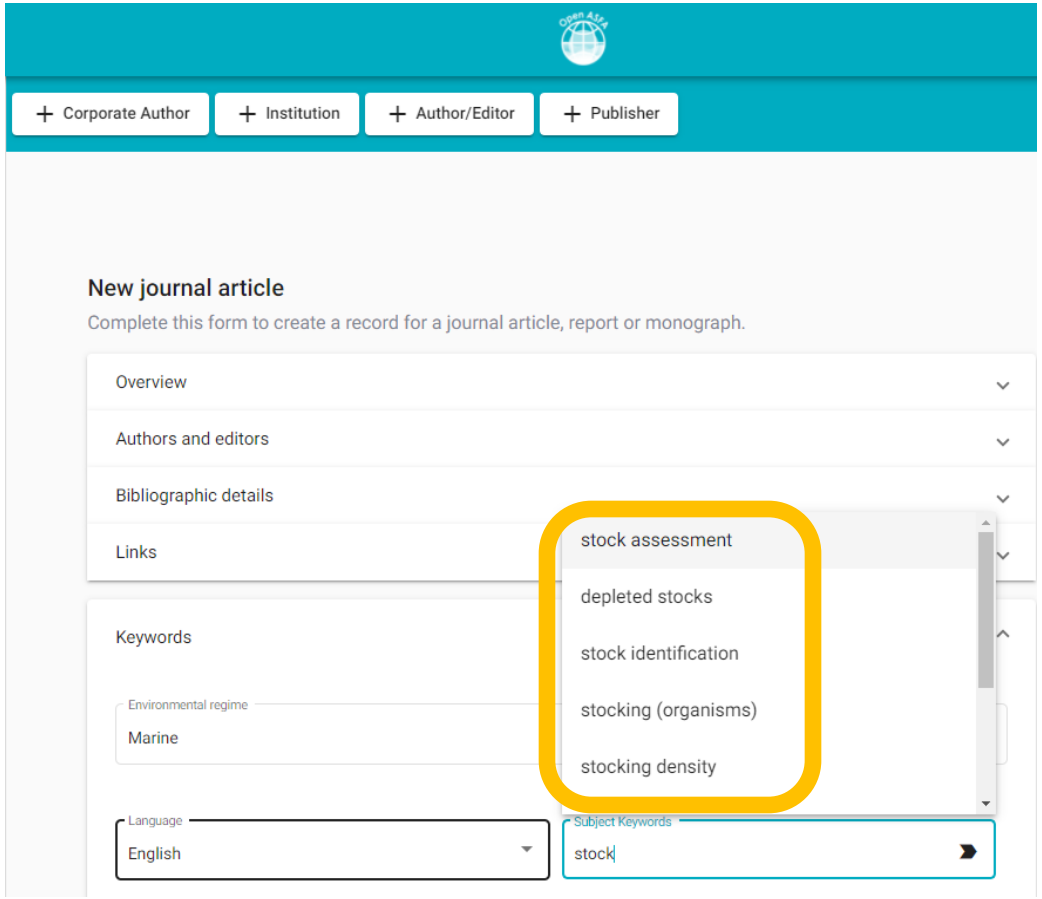
E) Perspective by the FAO Information and knowledge management Team

GRSF provides neutral UUID's in data collation efforts – prospect of collaboration with ASFA

The ASFA partnership provides a network which promotes visibility of grey literature and data

GRSF UUIDs can be used by ASFA partners through the new OpenASFA platform to index relevant literature and data on status of stocks and fisheries

e.g. based on Species, Area, and "Flag" ..., we can automatically add the GRSF UUID)



GRSF UUID's can be used in data poor situations

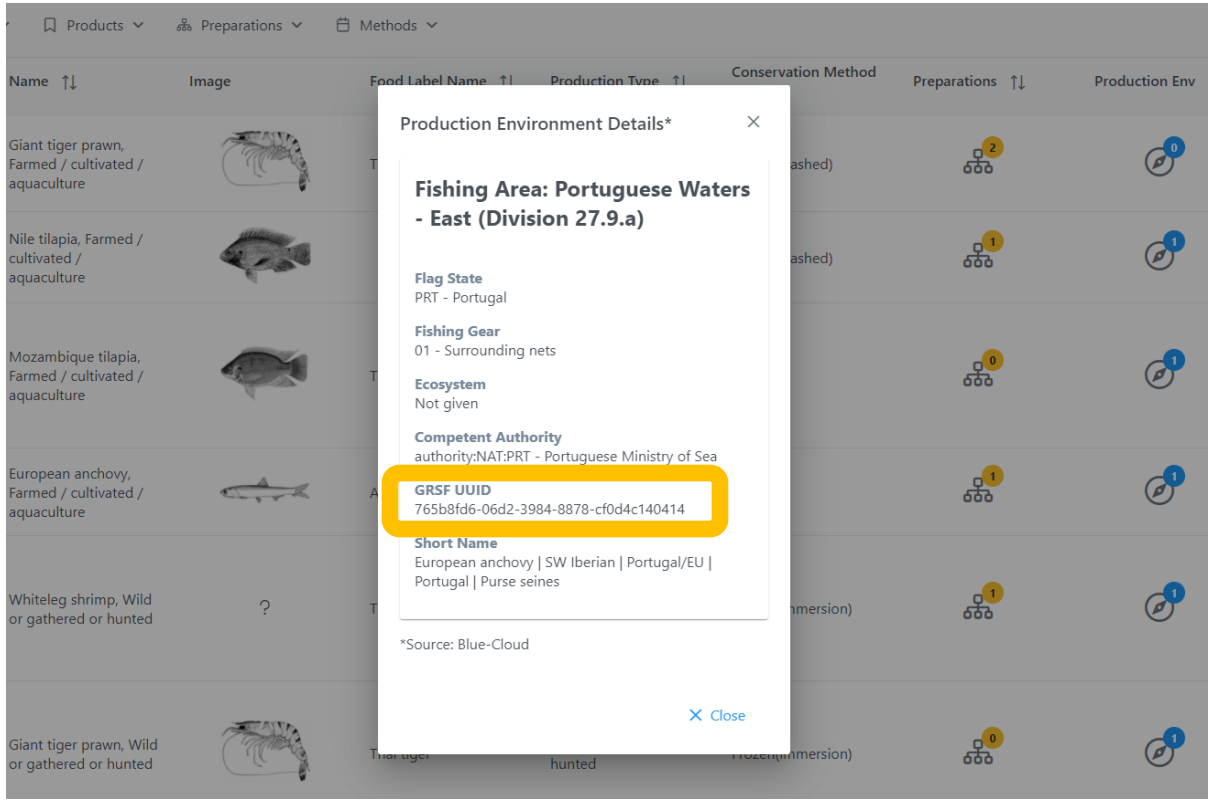
7. Data use and Partners' perspectives on the GRSF

E) Perspective by the FAO Information and knowledge management Team

GRSF provides neutral UUID's in collation efforts – Connect with Food Composition Tables

Strategic programs by FAO and other international agencies emphasize Fish for nutrition

- The FAO INFOODS / UFish framework raises prospects of using GRSF UUIDs in Food Composition records



GRSF provides the hook to catch information on fish – Food composition example

7. Data use and Partners' perspectives on the GRSF

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We propose three breakout rooms (20 mns duration)

1. GRSF IT services and interoperability aspects
2. Stock status and monitoring
3. Traceability

7. Data use and Partners' perspectives on the GRSF

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Back to plenary from the breakout rooms (40 mns duration)

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Thank you ▪ Merci
Благодарю ▪ ¡Muchas gracias!
謝謝 ▪ شكرا

FIRMS-Secretariat@fao.org