



Geographic Information Standards — CWP Harmonization outlooks

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CWP GIS working group – Objectives & activities

GIS data survey – summary & outputs

Activity 1 – Spatial grid systems

Activity 2 – GIS data and metadata standards

Activity 3 – GIS datasets of interest

- **Background**

Activities & discussions primarily based on the content & recommendations of the [*Handbook on GIS Matter*](#) concept note circulated at last CWP 25th Plenary session.

Created together with the *ad-hoc reference data harmonization task group* to discuss about data geo-referencing and geographic information standards.

- **Objective**

To expand and develop a GIS section of the CWP Handbook

- **Three main working areas**

- *Activity 1 – Spatial gridded systems for fishery data reporting*
- *Activity 2 – Strengthening promotion and implementation of geographic information standards*
- *Activity 3 – Establish a list of GIS datasets and layers relevant for fishery*



- **CWP members involved**

- Group members (as listed in the ToRs)
FAO, GFCM, ICES, IOTC, NACA, (SEAFO)
- Participation of FAO, GFCM, ICES, IOTC
- Additional information collected from CWP ad-hoc Reference Harmonization Task Group members: ICCAT, CCSBT

- **Working group activities**

- E-meetings with all members, exchanges done on individual basis
- Information shared with/from the *ad-hoc reference harmonization task group*
- GIS data survey prepared by FAO and shared to group members
- Additional information collected by FAO through the Research Data Alliance (RDA) Fishery Data Interoperability (FDI) working group
- Technical support: publication of CWP geographic reference datasets

- **Working document** available at http://www.fao.org/fi/static-media/MeetingDocuments/cwp/cwp_IS_2017/7e.pdf



- **Objective**

To collect material from CWP members on the three main working areas and trigger discussions for recommendation proposals

- **Participating members:** FAO, GFCM, IOTC, ICES + ICCAT

- **Survey template** (see working report – annex)

- Scope: survey filled by members for each dataset (or database)
- Geo-referencing characteristics
 - **Spatial Reference System**
 - **Geographic classification system** type & characteristics
Coordinates / Grid (extent, shape, resolution) / Areas
 - **Grid coding system** (if any)
 - GIS reference datasets & geo-referenced data access (if any)
 - **Data** access through web, formats & standards used
 - **Metadata** availability, formats & standards used

- Outputs available [here](#)

• Survey outputs (1)

- **Spatial Reference System**: World Geodetic System (WGS84, EPSG:4326)
- **Geographic classification systems** used
 - **Grid classification** (reporting) **systems**
 - Global extent: square shape, main resolutions: 1deg, 5deg
 - Use by t-RFMOs and FAO
 - Among t-RFMOs, only IOTC is using CWP areal **grid coding system**
 - Regional extent:
ICES statistical rectangles, GFCM grid system
 - Compatible with CWP areal **grid coding system**
 - But custom coding system used
 - **Area classification systems**
 - FAO major fishing areas
 - Regional statistical areas
ICES fishing areas (breakdown of FAO major fishing areas)
GFCM Statistical Areas (GSAs)

- **Survey outputs (2)**

- GIS reference datasets & geo-referenced data

- Data Access

- Web access: available for GFCM, ICES, FAO. Planned by ICCAT, IOTC
- GIS data **formats**
 - Not always used, e.g. PDF format only
 - ESRI Shapefile (proprietary format) used + OGC formats
- GIS data **services**: Only FAO & ICES with standard OGC data services

- **Metadata** availability

Note: this survey section was generally not filled, and not well understood, highlighting the need to define well **GIS metadata**.

- GIS metadata **formats**

Only ICES and FAO are providing metadata resources using standard ISO 19115/19139 (approved OGC standard)

- GIS metadata **services**

Only ICES and FAO with standard OGC metadata services

Activity 1 – Spatial gridded systems for fishery data reporting

Outputs

- **Draft Set of key definitions**

- **Grid classification (reporting) system**
and its characteristics: extent/scale,
grid unit / cell shape, resolution

System defined by a regular geo-referenced grid characterized by (i) a maximum geographic extent or scale (global, regional, local), (ii) a grid unit/cell shape (e.g. square, rectangle), (iii) a grid resolution (e.g. 1 x 1deg, 5 x 5 deg). In practice, such system may be used for on-board data collection and underlying data aggregation, specifically for Tuna RFMOs.

- **Grid coding system**

Logic associated to a grid classification system, and that allows converting a pair of geographic coordinates (Longitude / Latitude) into a string-based code, and vice-versa. In the computing field, coding will mean both *encoding* and *decoding*. Examples: Areal grid system (CWP), C-square. For certain grid resolution, these two coding systems correspond to two different mechanisms to encode/decode for a same *Grid classification system*.



Activity 1 – Spatial gridded systems for fishery data reporting

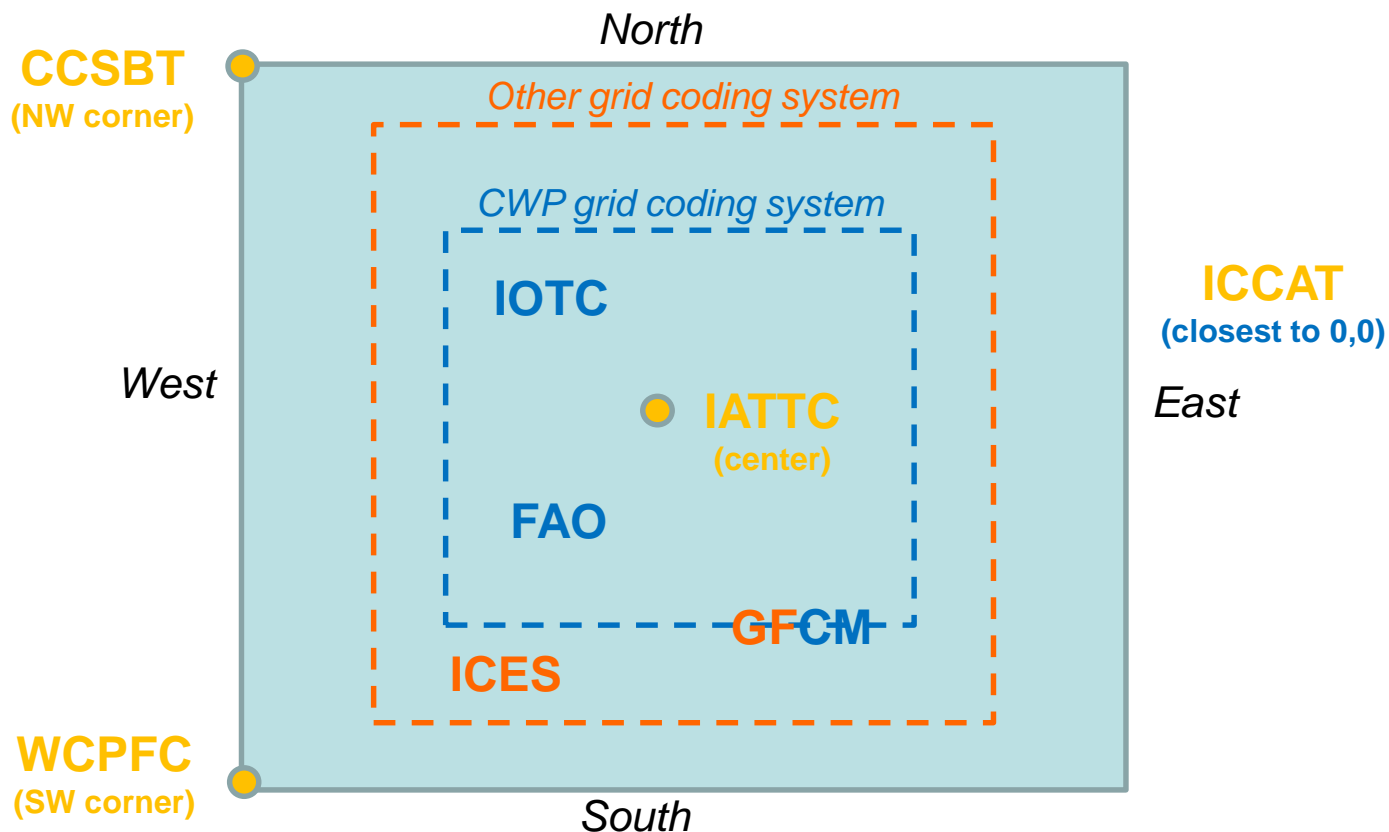
Outputs

- **Adoption of current CWP areal grid coding system very limited**
 - Use by FAO Tuna Atlas. Among t-RFMOs , only IOTC is using it at various resolutions.
 - ICCAT mentions it in its maps information (https://www.iccat.int/Data/ICCAT_maps.pdf), but there is no evidence of grid codes in exchanged datasets
 - Use of coordinates:
 - square center (IATTC)
 - north-west corner (CCSBT)
 - south-west corner (WCPFC)
 - Regional custom grid system used by ICES and GFCM

Activity 1 - Spatial gridded systems for fishery data reporting

Outputs

- Adoption of current CWP areal grid coding system very limited





Activity 1 – Spatial gridded systems for fishery data reporting

Recommendations proposal

- **Main recommendations**

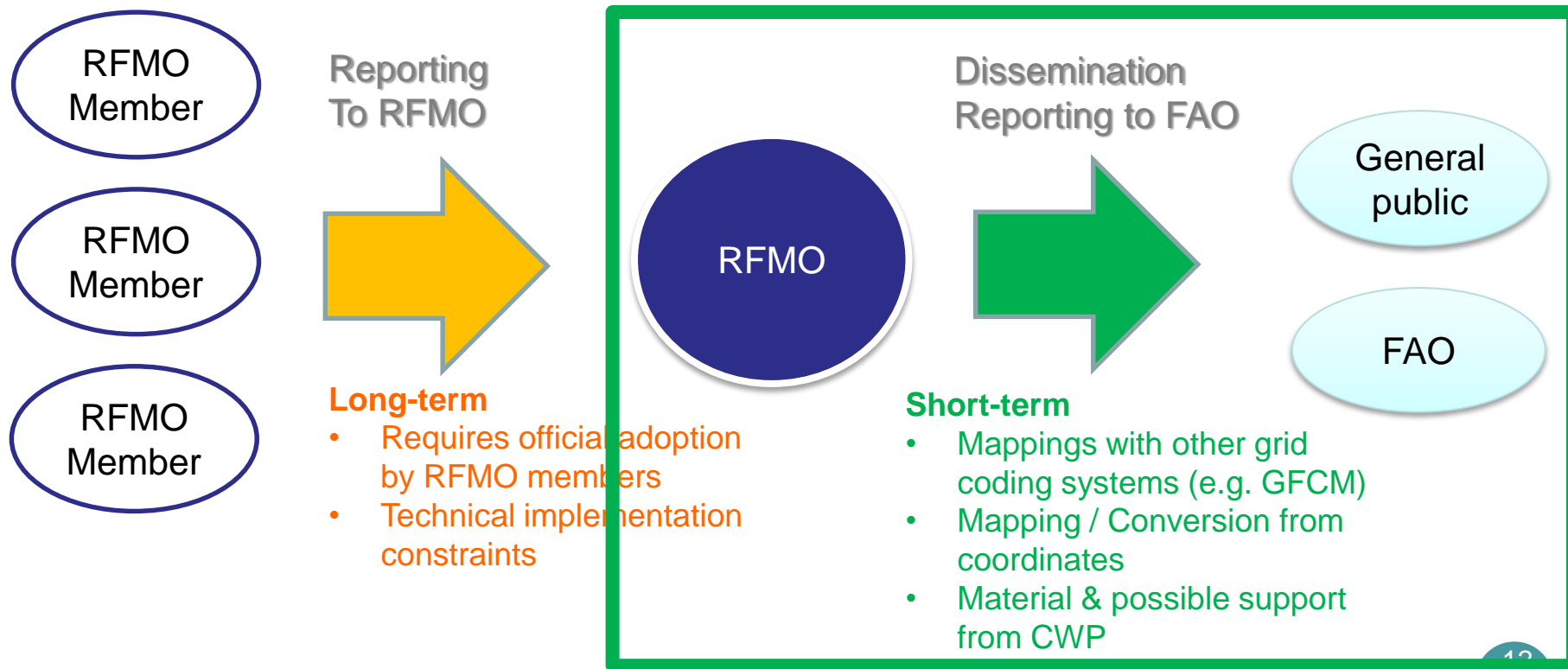
- Refine & Validate key definitions with CWP members
- Keep the CWP areal grid coding system as single areal grid system. No alternate grid coding system recommended (for now).
- Encourage the use of CWP areal grid coding system when compatible grid classification systems are used.
 - *What are the factors explaining that CWP areal grid coding system is not used?*
 - *Is CWP grid coding system not clear enough?*
 - *Is there a lack of common tools to use it?*

Activity 1 - Spatial gridded systems for fishery data reporting

Recommendations proposal

- **Main recommendations**

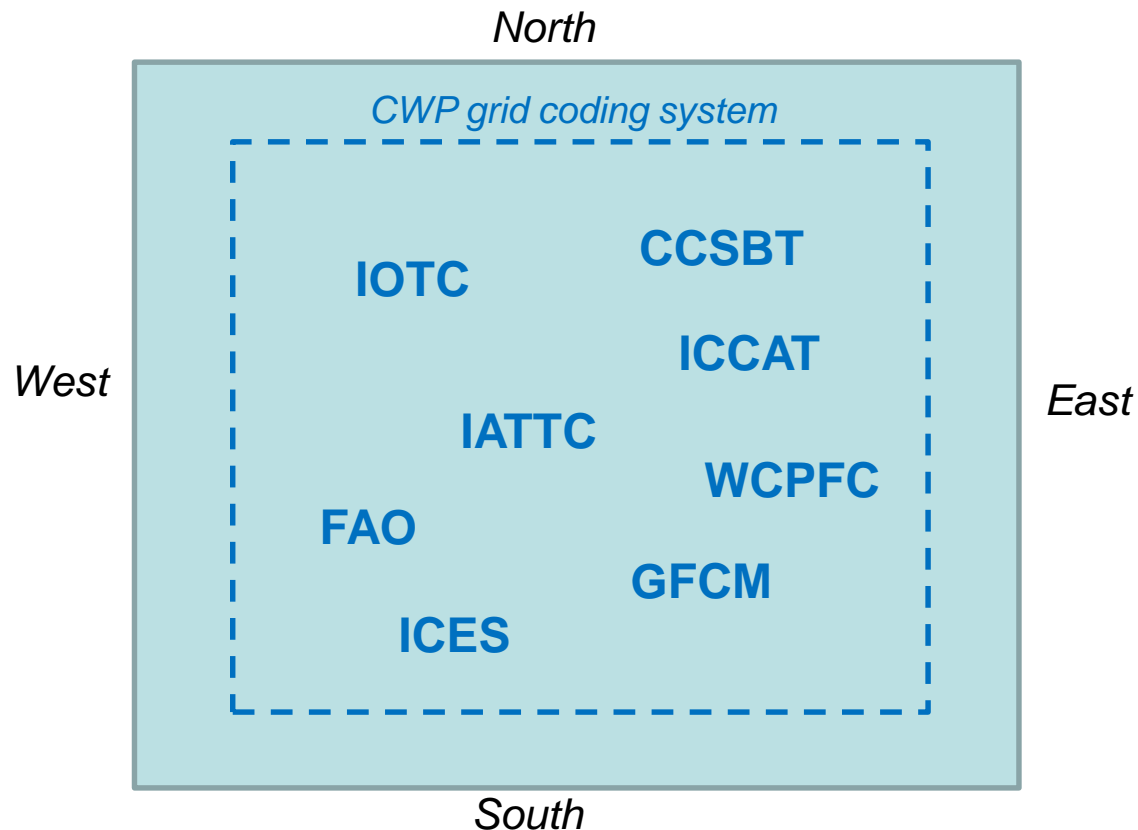
- Towards adoption of CWP areal grid coding system in iterative way?



Activity 1 - Spatial gridded systems for fishery data reporting

Outputs

- *Is there a pathway towards this?*





Activity 2 – Strengthening promotion and implementation of geographic information standards

Outputs

- **Scope:** *fishery data* including
 - Fishery information & knowledge* (GIS references & derivate datasets),
Fishery dependent or independent data
- **Need of key definitions** based on 6 levels of geo-referencing
 - 1- Coordinate Reference Systems**
 - 2- Use of geographic coordinates**
 - 3- Geographic classification systems**, with distinction of 3 types: *locations, linear transects & areal classification systems* (grids or irregular areas)
 - 4- Geographic coding systems**, with distinction of 2 types: *coding conventions* (for *locations, transects* and *irregular areas*) and *grid coding systems*
 - 5 - Geographic (Meta)data formats**
 - 6 - Geographic (Meta)data services**



Activity 2 – Strengthening promotion and implementation of geographic information standards

Recommendations proposal

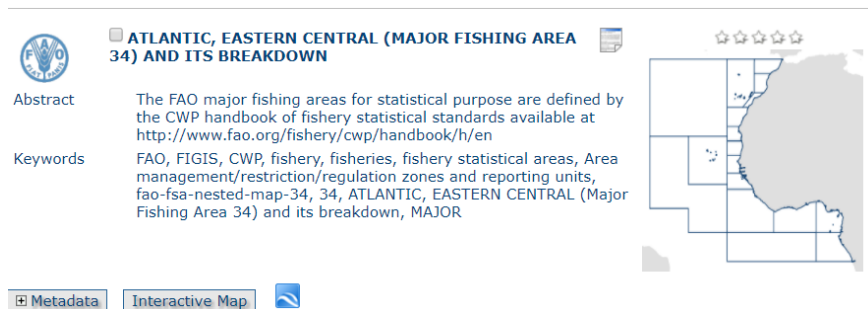
- **Main recommendations**

- Refine & Validate key definitions
- Promote adoption of a single world coordinate reference system (WGS84) and its proper use in geo-referenced datasets
- Adoption of key geographic classification systems (e.g. CWP grid coding system)
- Promote adoption of existing geographic information international standards for (meta)data formats and services in support of FAIR principles (*Findable, Accessible, Interoperable, Readable*)
 - ISO 19115/19139 Metadata format for describing datasets
 - OGC Catalogue Service for the Web standard
 - OGC data web-services
- Strengthen the collaboration with RDA Fishery Data Interoperability WG

Activity 3 – Establish a list of GIS datasets and layers relevant for fishery

Outputs


- **CWP geographic reference datasets available**
 - Data collections:
 - FAO Major Areas & breakdown
 - Global grids (with areal grid coding)



ATLANTIC, EASTERN CENTRAL (MAJOR FISHING AREA 34) AND ITS BREAKDOWN

Abstract
The FAO major fishing areas for statistical purpose are defined by the CWP handbook of fishery statistical standards available at <http://www.fao.org/fishery/cwp/handbook/h/en>

Keywords
FAO, FIGIS, CWP, fishery, fisheries, fishery statistical areas, Area management/restriction/regulation zones and reporting units, fao-fsa-nested-map-34, 34, ATLANTIC, EASTERN CENTRAL (Major Fishing Area 34) and its breakdown, MAJOR



Metadata Interactive Map



CWP GRID - RESOLUTION 5DEG X 5DEG

Abstract
Global vector grid at 5deg x 5deg resolution

Keywords
CWP, FAO, Areal grid system, FIGIS, fishery statistics



Metadata Interactive Map

- Data & metadata Standards
 - Data: CSV, OGC Formats and Services
 - Metadata: Dataset description using ISO 19115/19139, Catalogue Service for The Web



Activity 3 – Establish a list of GIS datasets and layers relevant for fishery

Recommendations proposal

- **Set-up and use of standard Catalogue for CWP**
 - Based on standard and interoperable service: OGC CSW – **Catalogue Service for the Web**
 - Standard metadata format for describing datasets: ISO-OGC **19115/19139**
 - Easy way to
 - Find datasets
 - Access datasets
 - Contributes to standardize how/where data can be extracted
 - Harvest resources in interoperable way from another catalogue or tool
 - Re-use data



Activity 3 – Establish a list of GIS datasets and layers relevant for fishery

Recommendations proposal

- **To foster availability of RFMO georeferenced data (starting with reference data) through data & metadata services**

Is the T-RFMO envisaging to set-up his own catalogue?

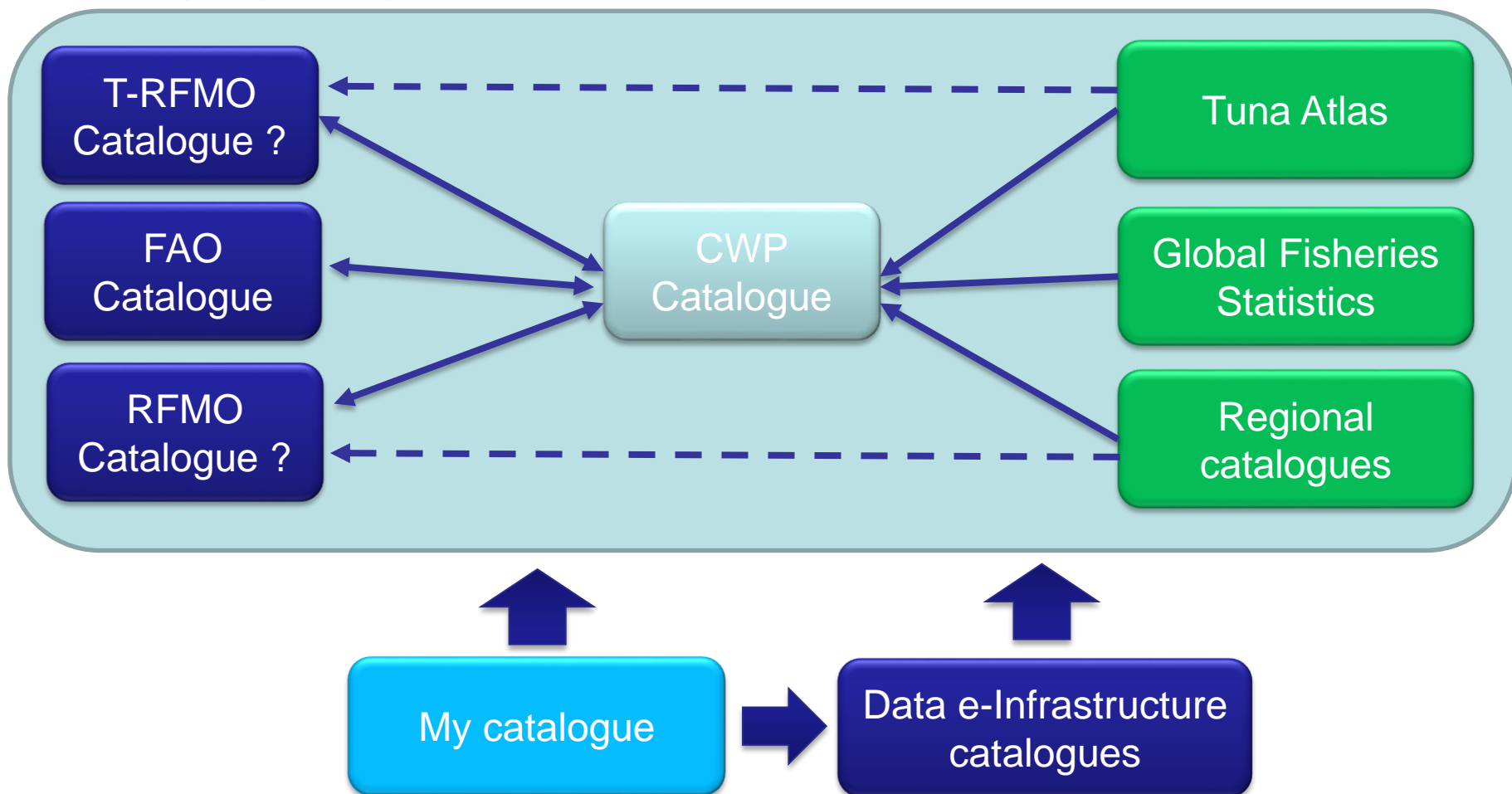
Would the T-RFMO require:

a direct use of CWP catalogue?

possible CWP Secretariat technical support?

- **Examples:**
 - **ICCAT** Sampling Areas and Stocks/Statistical Areas
 - **GFCM** Statistical Areas & Statistical Grid

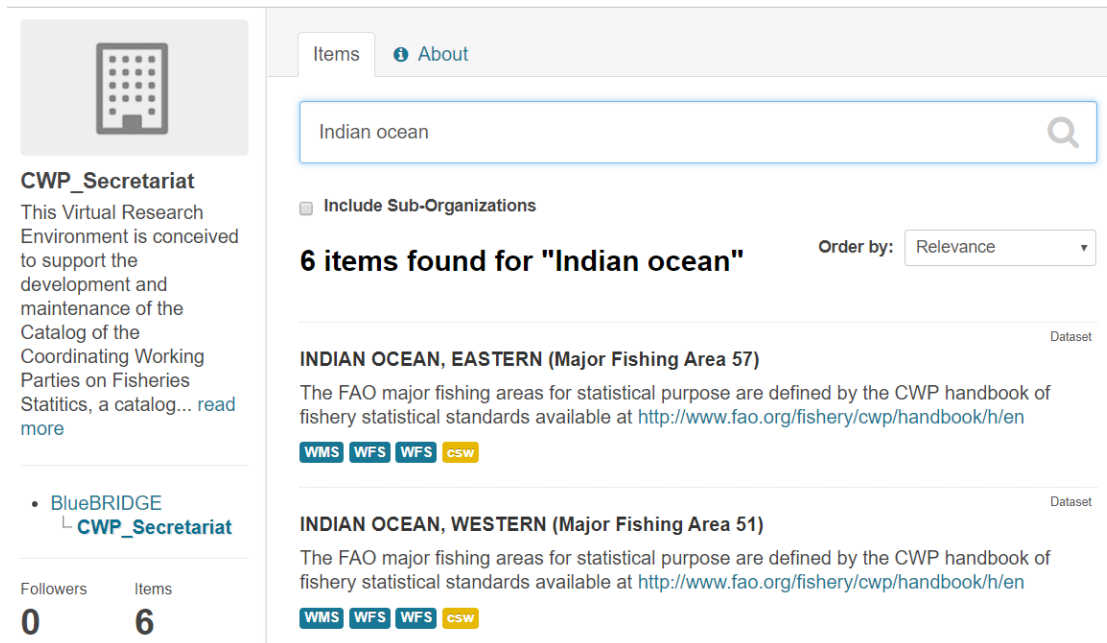
Activity 3 – Establish a list of GIS datasets and layers relevant for fishery



Activity 3 – Establish a list of GIS datasets and layers relevant for fishery

Recommendations proposal

- **Set-up and use of standard Catalogue for CWP**
 - Example of interoperable harvesting for CWP web catalogue.



The screenshot displays the CWP Secretariat web catalogue interface. On the left, there is a profile for 'CWP_Secretariat' with a description: 'This Virtual Research Environment is conceived to support the development and maintenance of the Catalog of the Coordinating Working Parties on Fisheries Statistics, a catalog... read more'. Below the profile, it shows 'BlueBRIDGE' and 'CWP_Secretariat' with 0 followers and 6 items. The main content area features a search bar with 'Indian ocean' entered, a search icon, and a checkbox for 'Include Sub-Organizations'. The search results show '6 items found for "Indian ocean"'. The first result is 'INDIAN OCEAN, EASTERN (Major Fishing Area 57)', labeled as a 'Dataset'. Its description states: 'The FAO major fishing areas for statistical purpose are defined by the CWP handbook of fishery statistical standards available at <http://www.fao.org/fishery/cwp/handbook/h/en>'. It includes tags for WMS, WFS, WFS, and CSW. The second result is 'INDIAN OCEAN, WESTERN (Major Fishing Area 51)', also labeled as a 'Dataset', with the same description and tags.



Thank you for your attention