Blue-Cloud

Piloting innovative services for Marine Research & the Blue Economy

Blue Cloud Fisheries Monitor Demonstrator

Webinar on Fisheries Data Management

IFREMER, IRD, FORTH, FAO

Blue-Cloud has received funding from the European Union's Horizon Programme call BG-07-2019-2020, topic: [A] 2019 - Blue Cloud services, grant Agreement number 862409.

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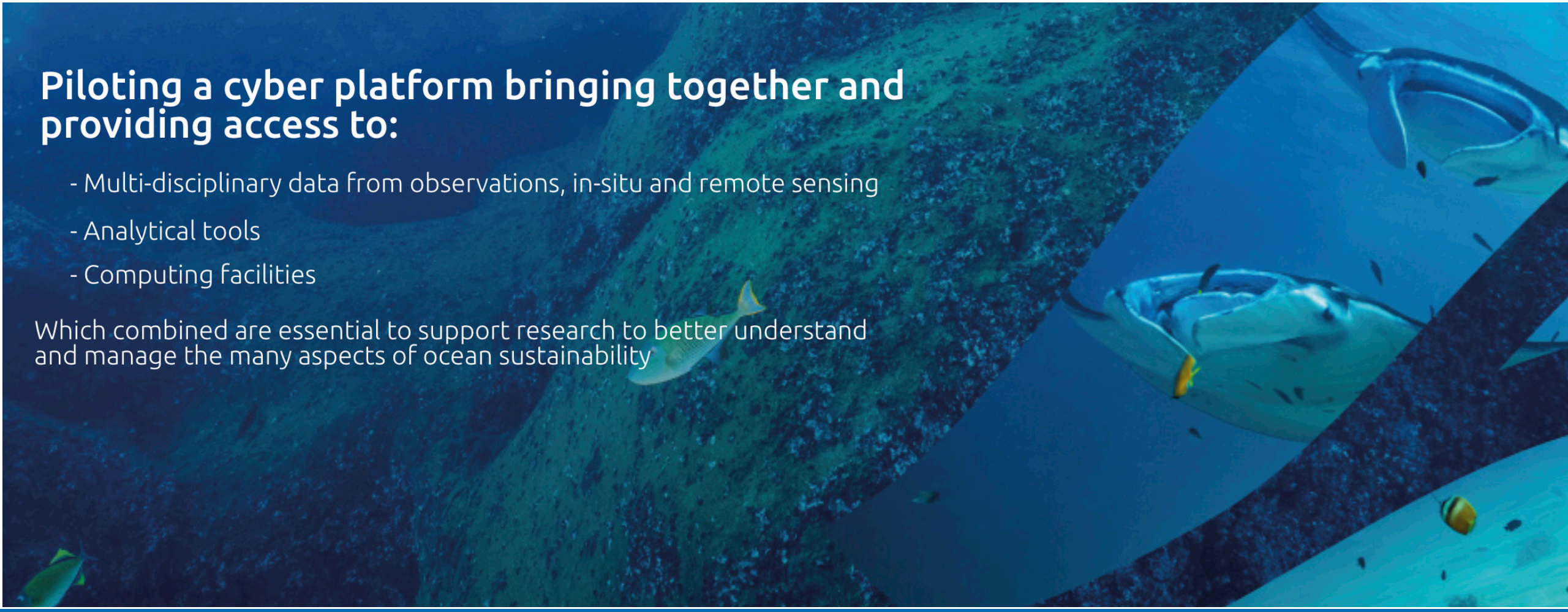
Agenda

- **14:00 - Opening and introduction (Trust-IT Services – F. Spagnoli)**
- 14:05 - Demonstrator Vision and Mission (FAO – A.E. Nieblas)
- 14:10 - Fisheries Atlas Objectives and tasks (IRD – J.Barde)
- 14:20 - Fisheries Atlas Activities and Tools (FAO – E.Blondel)
- 14:30 - Global Record of Stocks and Fisheries (FORTH – Y. Marketakis, FAO – A.Gentile)
- 14:40 - Conclusion and Discussion (A. Ellenbroek & F. Spagnoli)

Blue-Cloud vision

Blue-Cloud aims to become *the* environment for the “Blue community”, offering access to **an unprecedented wealth of multi-disciplinary data resources and added-value services** for the benefit of the future marine research and blue economy landscapes.

Blue-Cloud mission



Piloting a cyber platform bringing together and providing access to:

- Multi-disciplinary data from observations, in-situ and remote sensing
- Analytical tools
- Computing facilities

Which combined are essential to support research to better understand and manage the many aspects of ocean sustainability

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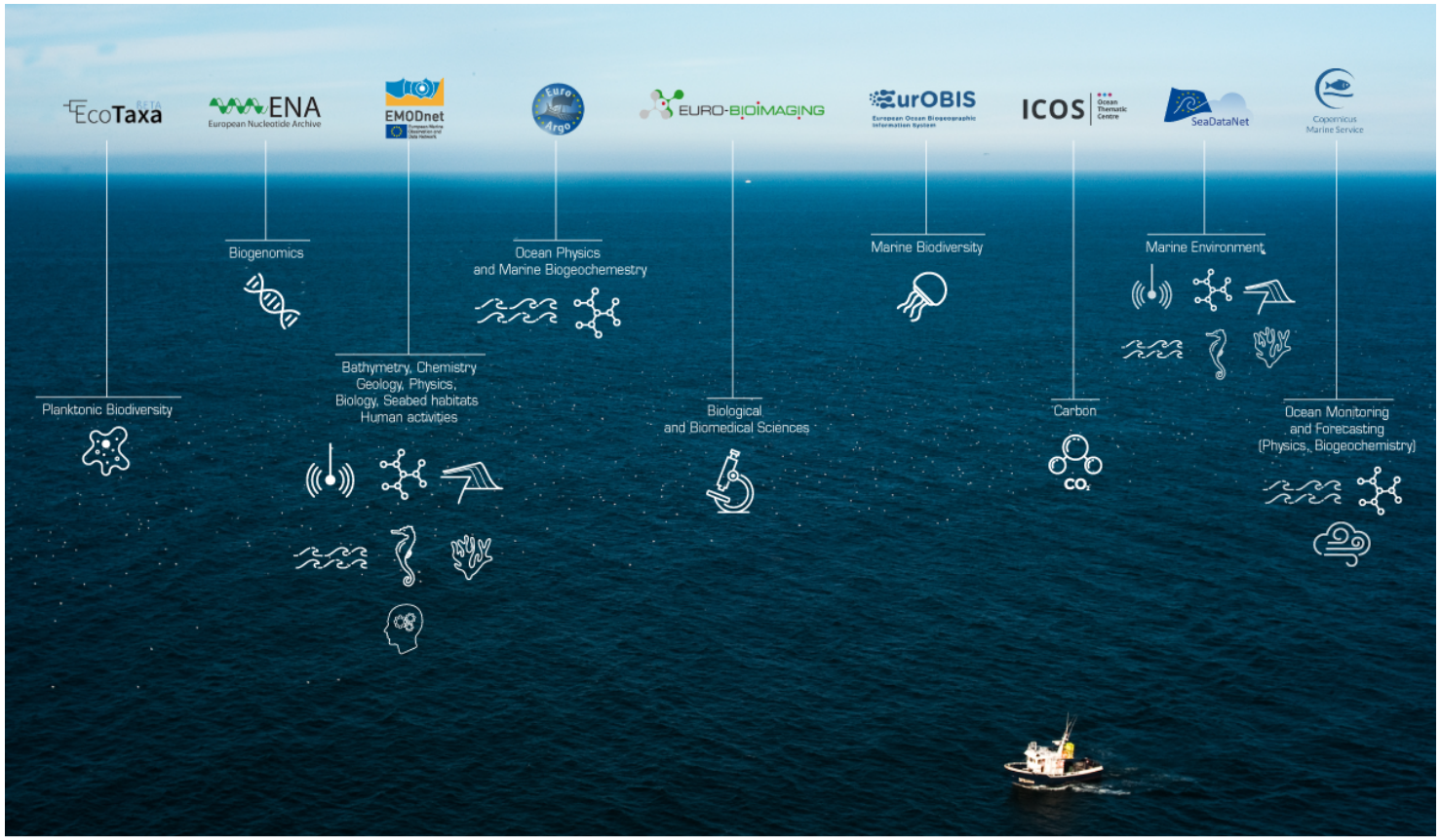
A smart federation of existing data, computing, storage resources & analytical services



- a **Data Discovery and Access Service** to facilitate sharing with users of multi-disciplinary datasets
- a **Blue-Cloud Virtual Research Environment** to facilitate the orchestration of computing and analytical services

Copernicus Europe's eyes on Earth · WEkEO · D4SCIENCE INFRASTRUCTURE · EUDAT Collaborative Data Infrastructure

Blue-Cloud in the policy context

- Blue-Cloud Roadmap to 2030
- European Open Science Cloud (thematic clouds)
- SDGs & UN Decade of Ocean Science for sustainable development
- EU Green Deal
- Digital Twin Ocean

- **12 October – 6 November 2020**
  Online stakeholder consultation

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Early results

- D2.1 Blue Data Infrastructures
- D3.1 Demonstrator general technical requirements
- Blue-Cloud Gateway (workspace)
- Blue-Cloud website www.blue-cloud.org
- Blue-Cloud workshop and presentation at the All-Atlantic Ocean Research Forum (Feb 2020) https://www.youtube.com/watch?v=iYQirONAyYU
- Blue-Cloud position paper on EOSC (March 2020)
- Blue-Cloud featured in ECO Magazine (May-June 2020)
- First Blue-Cloud webinar introducing the five demonstrators (June 2020)
- Activated collaborations with other projects & thematic clouds – Synergies page
- Set up an External Stakeholder Experts Board (ESEB), featuring key representatives from the marine research community and the policy landscape
- Blue-Cloud featured in ERCIM News special issue on Blue Growth (October 2020)

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Five real-life demonstrators

Biodiversity

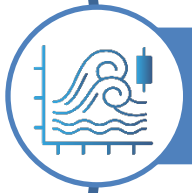
Environment

Fisheries

Aquaculture

Zoo- and Phytoplankton EOV products

Plankton Genomics



Marine Environmental Indicators

Fish, a matter of scales

Aquaculture Monitor

Blue-Cloud

Five demonstrators

Biodiversity

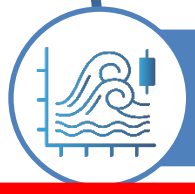
Environment

Fisheries

Aquaculture

Zoo- and Phytoplankton EOV products

Plankton Genomics



Marine Environmental Indicators

Fish, a matter of scales

Aquaculture Monitor

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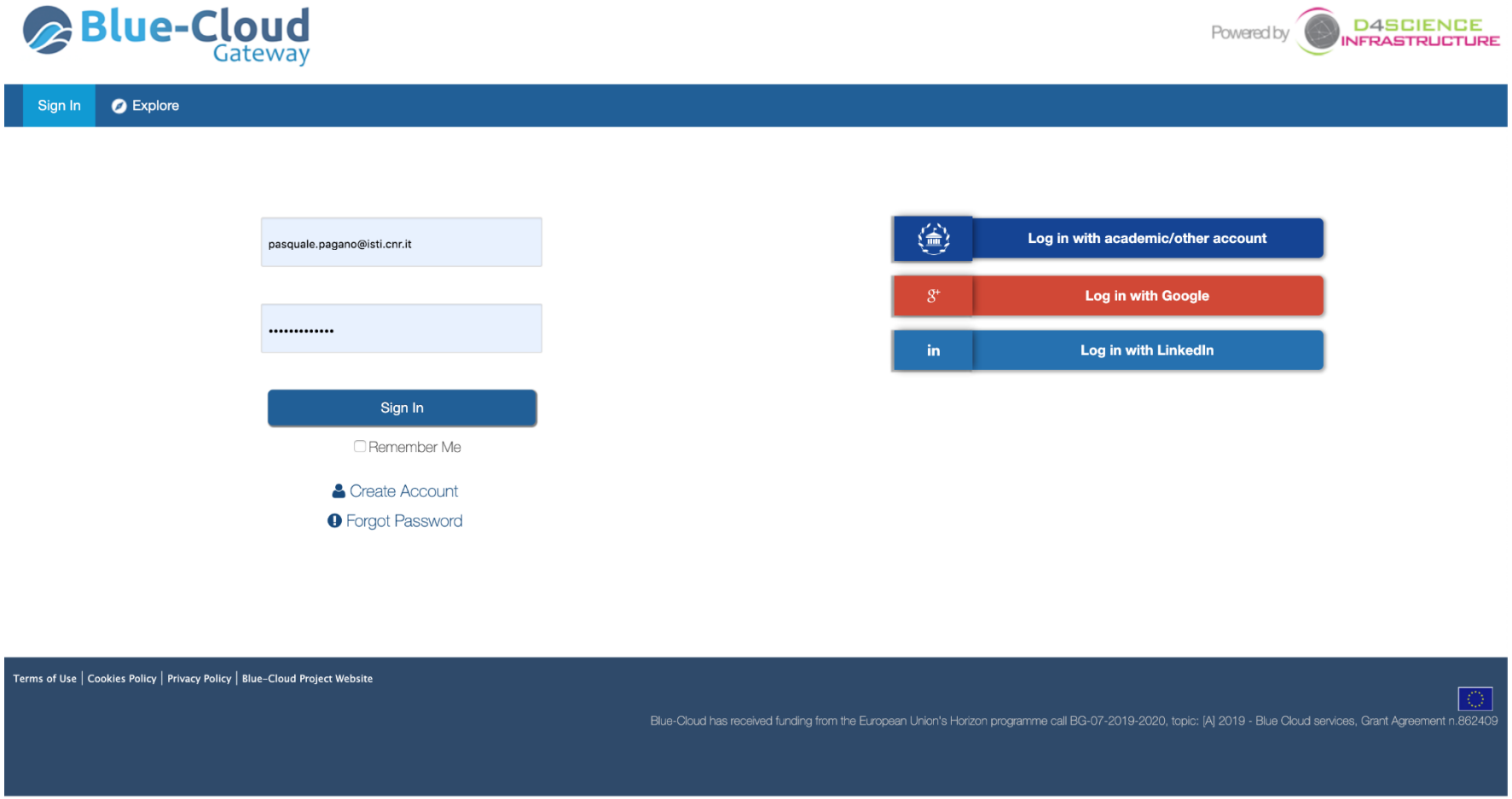
Fisheries Atlas

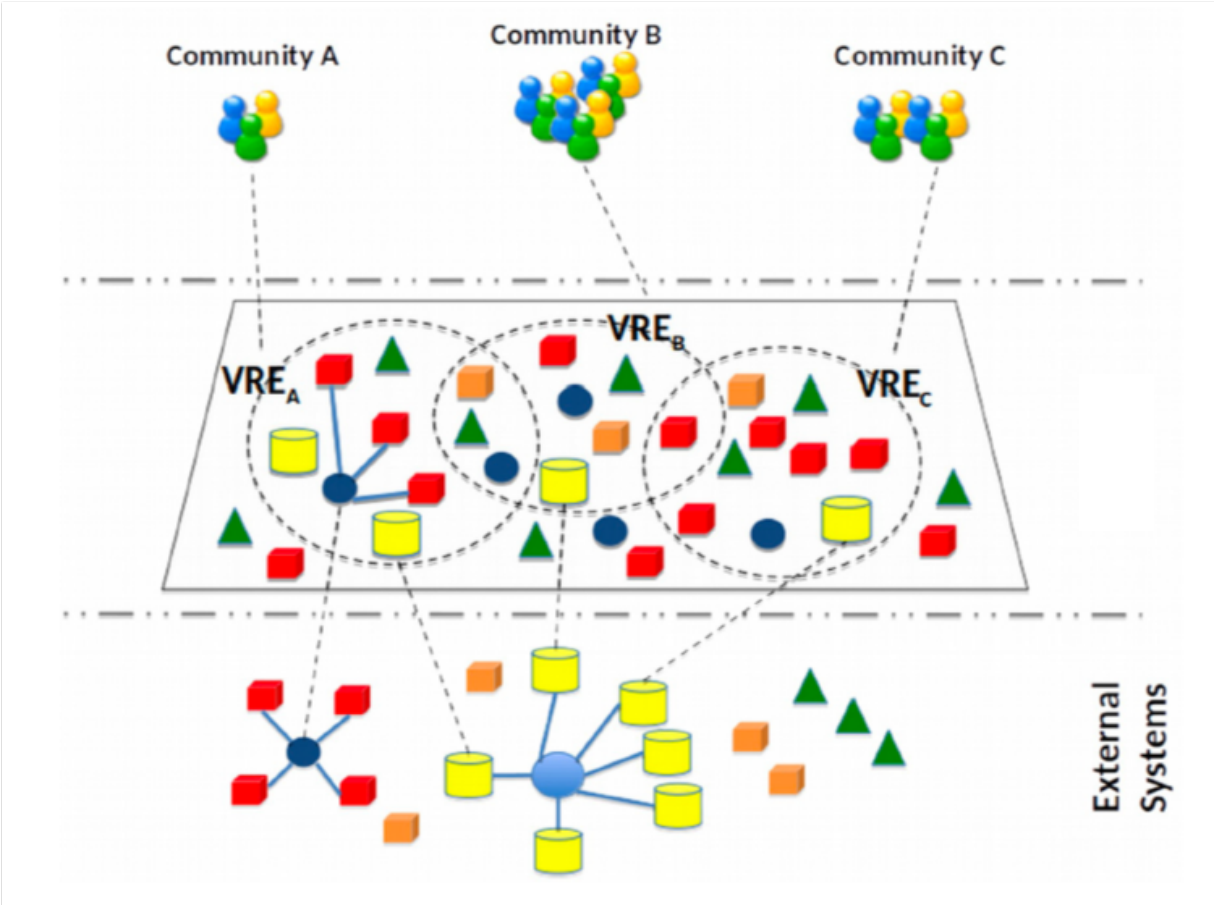
- Managed by FAO & IRD & FORTH
- Ambition: deliver tools to manage fisheries data and disseminate aggregate statistics and maps
- Expand analytic capabilities
  - Understand fisheries effort and contribution to food-systems;
  - Fisheries relation to the environment and biodiversity;
- Provide robust & replicable Open and FAIR environments
  - Databases, Open and Fair Mapviewers, Semantic KB, Registries

VREs to manage data…



In a data Infrastructure…

- Autonomous components
- Distributed
- Open



Assante, M., Candela, L., Castelli, D., Cirillo, R., Coro, G., Frosini, L., Lelii, L., Mangiacrapa, F., Marioli, V., Pagano, P., Panichi, G., Perciante, C., Sinibaldi, F. **The gCube System: Delivering Virtual Research Environments as-a- Service**. Future Generation Computer Systems (Vol. 95)

With loads of flexible integration
A swiss army knife for nerds

- Method available as-a-Service,
- Invoked via communication standards (WPS)

- Higher computational capabilities
- Automatic creation of a Web interface
- Provenance management
- Storage of results on a high-availability system
- Collaboration and sharing
- Re-usability, Reproducibility, Repeatability, also from other software

Demonstrator Objectives

Strengthen methodologies and tools in support of Fisheries Atlases

- **An Atlas; Not for FAO, but for global community**
  - A comprehensive overview of fisheries, supporting SDGs 2 and 14
  - Build and expand on the FAO/IRD H2020 Tuna Atlas – wider range of stocks and products
- **Methodology: Development through co-creation of a community**
  - 1. Identify available data, analytics and indicators
  - 2. Standardise inputs to create standardised outputs
  - 3. Develop cross-platform visualisations and analytical services
  - 4. Disseminate the estimate statistics; OpenFairViewer and GRSF
- **Tool: Virtual Lab as a Fisheries Atlas**:
  - Start from the FAO/IRD H2020 Tuna Atlas
  - Continue **integration in Blue Cloud** Demonstrator: #4 –Fish, a matter of scales

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Objectives & Tasks

WP3 Fisheries Atlas - Julien Barde (IRD)

The picture can’t be displayed.

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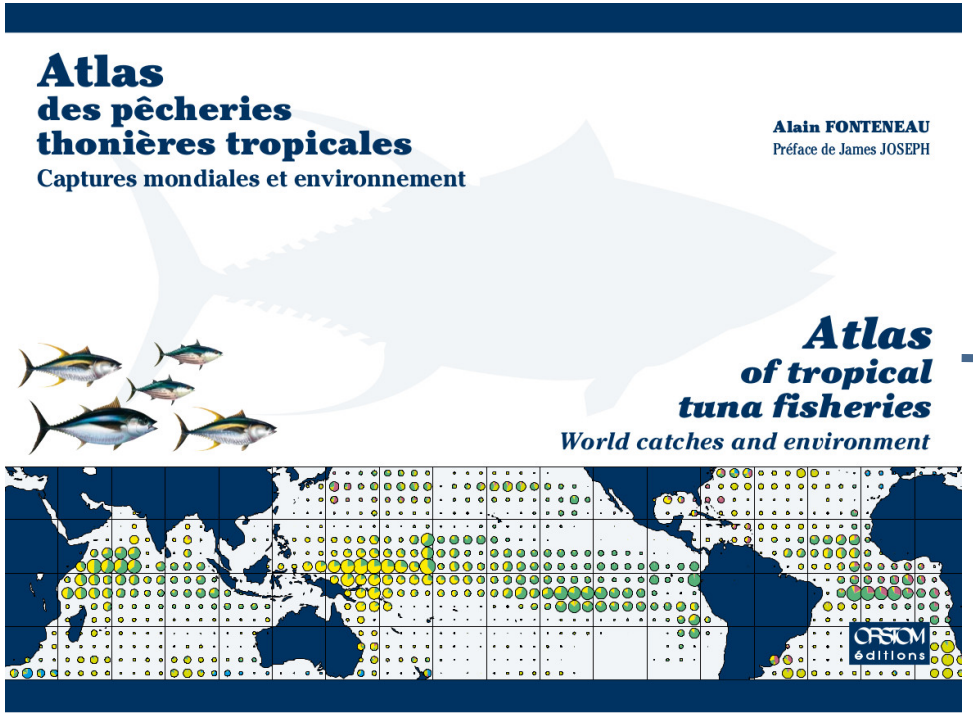
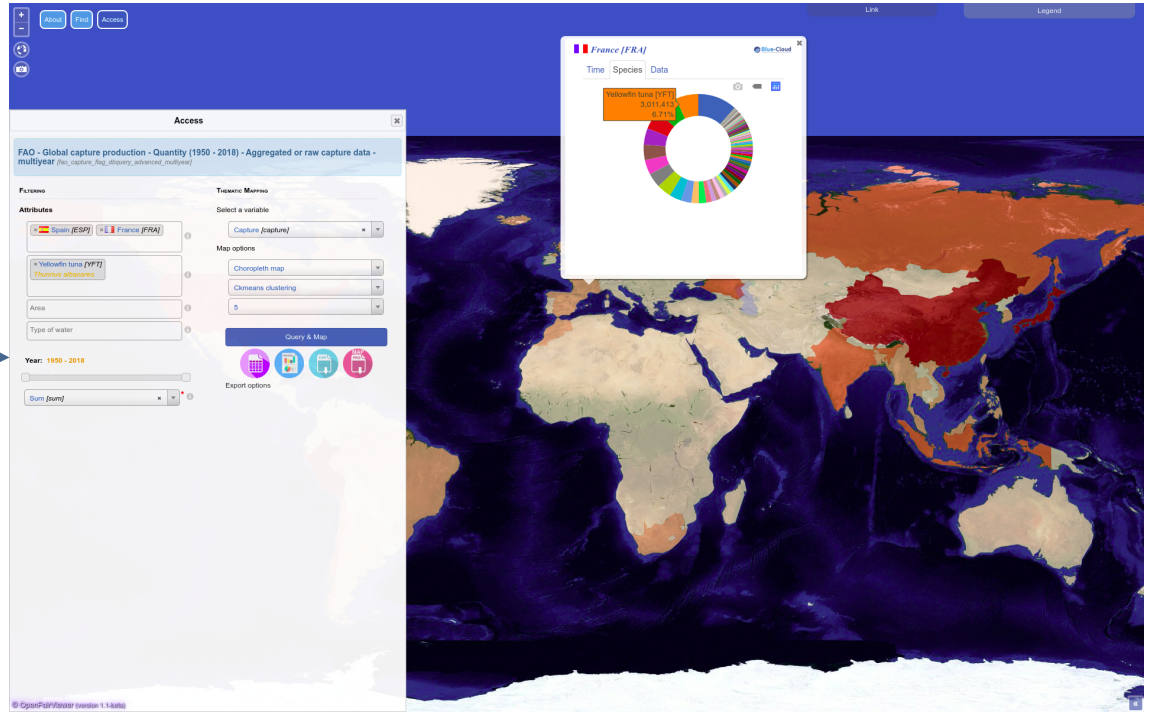
Tuna Atlas: more than 20 years





PDF

No data, static outputs (GIS plots), made on a PC

Open Data, interactive outputs (maps & dashboards) built on the fly
Made on a VRE

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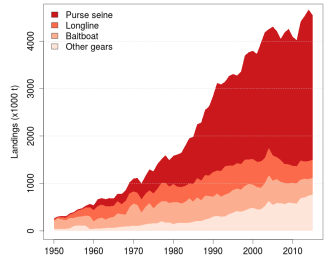
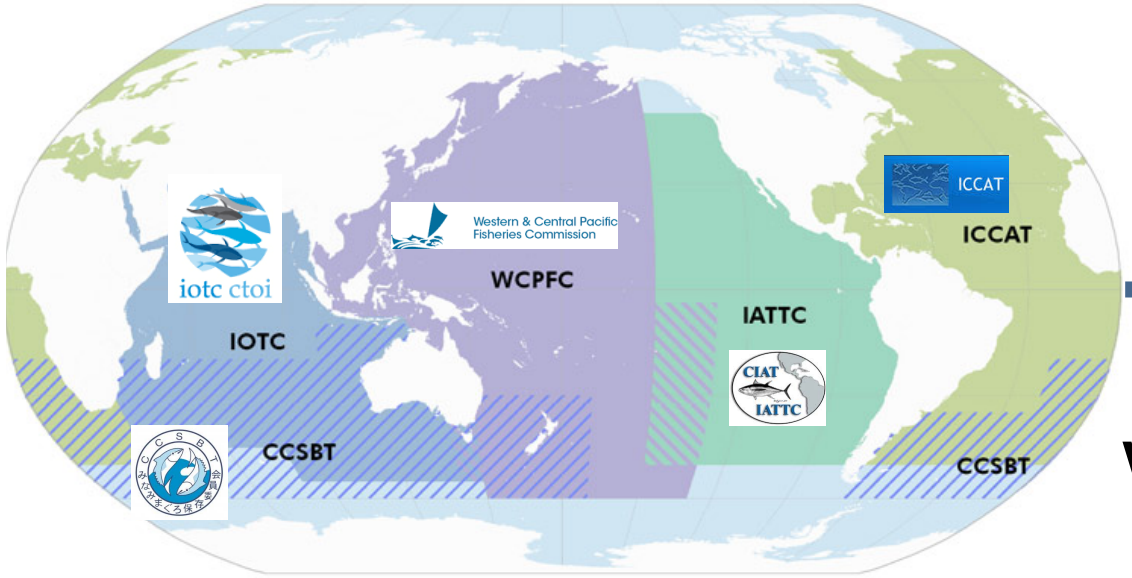
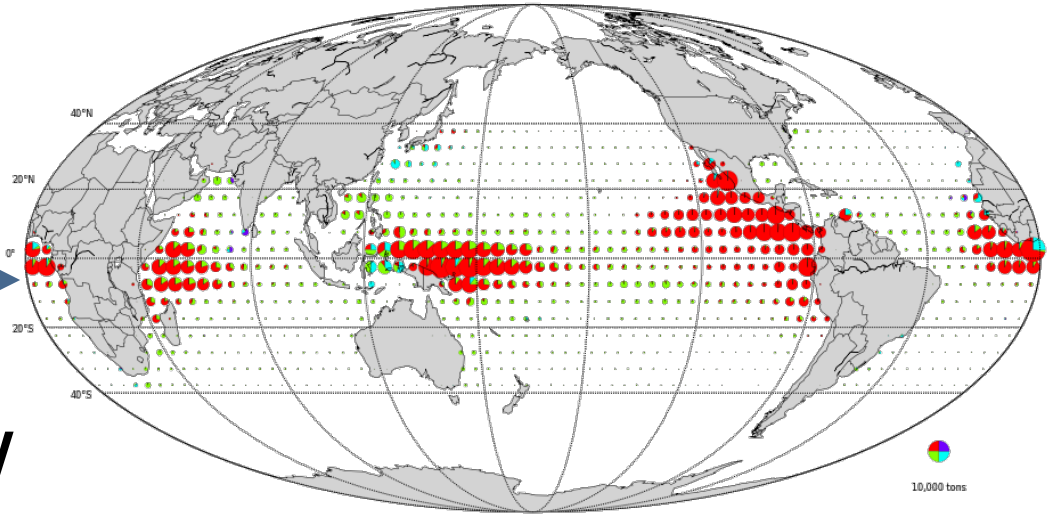
Tuna Atlas: a typical use case for fisheries data flows





workflow



5 Tuna Regional Fisheries Management Organizations (tuna RFMOs) => 5 regional data providers / ocean areas

A single data provider (FIRMS) and global datasets

CSV

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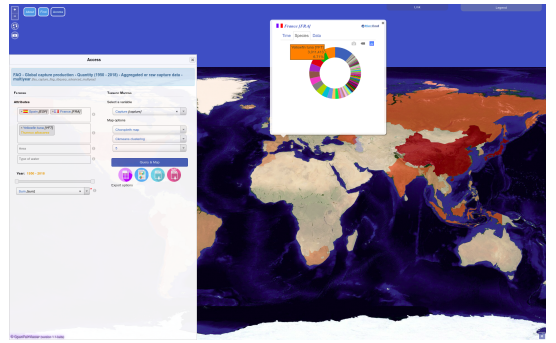
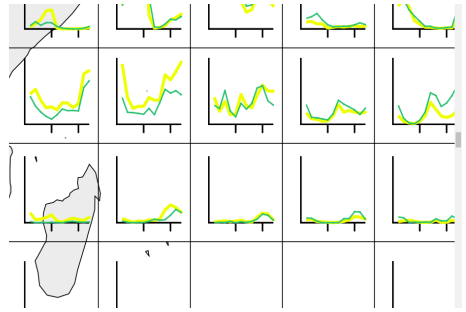
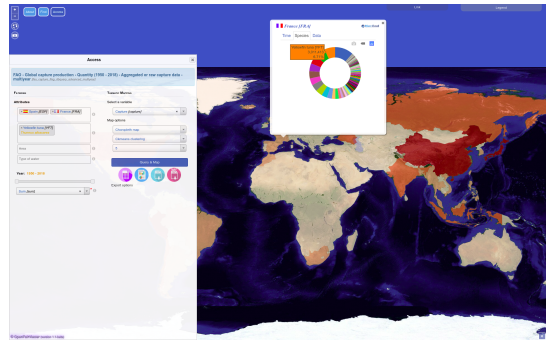
Objectives and Tasks (1)



- **Build a generic tool to set up any fisheries atlas:**
  - Proof of concept with **data cubes** and **tuna fisheries** use case
  - Main **variables (dimensions)** & **indicators**:
    - **Catches** (lat, lon, time, flag, gear, fads, species...),
    - **Effort** (lat, lon, time, flag, gear, fads...)
  - Upcoming variables and indicators (not only data cubes):
    - catch-at-size, tagging, biological data,
    - trajectories data: AIS / VMS, FADs...
    - environmental parameters (sst, chlo, wind...): e.g. climate change effect
  - Atlas => **visualize** & **explore** data and indicators:
    - maps,
    - interactive dashboards
    - maps and dashboards should be linked/interconnected



Objectives and Tasks (2)



- **Comply with best practices for data management:**
  - Make Fisheries data **FAIR** / a “ready to go” **DMP** for fisheries
  - **Workflow** to be managed by **R programming language** (the most relevant for this community)
  - Open & reproducible science approach: open data / source, standards…
- **Use a VRE (EOSC / BlueCloud) to run the workflow and host applications:**
  - Deploy a **spatial data infrastructure** with multiple software components
  - **Process** (R scripts): RStudio, Jupyter notebooks (tutorials), Dataminer
  - Host **visualization** tools: web mapping, interactive dashboards (shiny apps)

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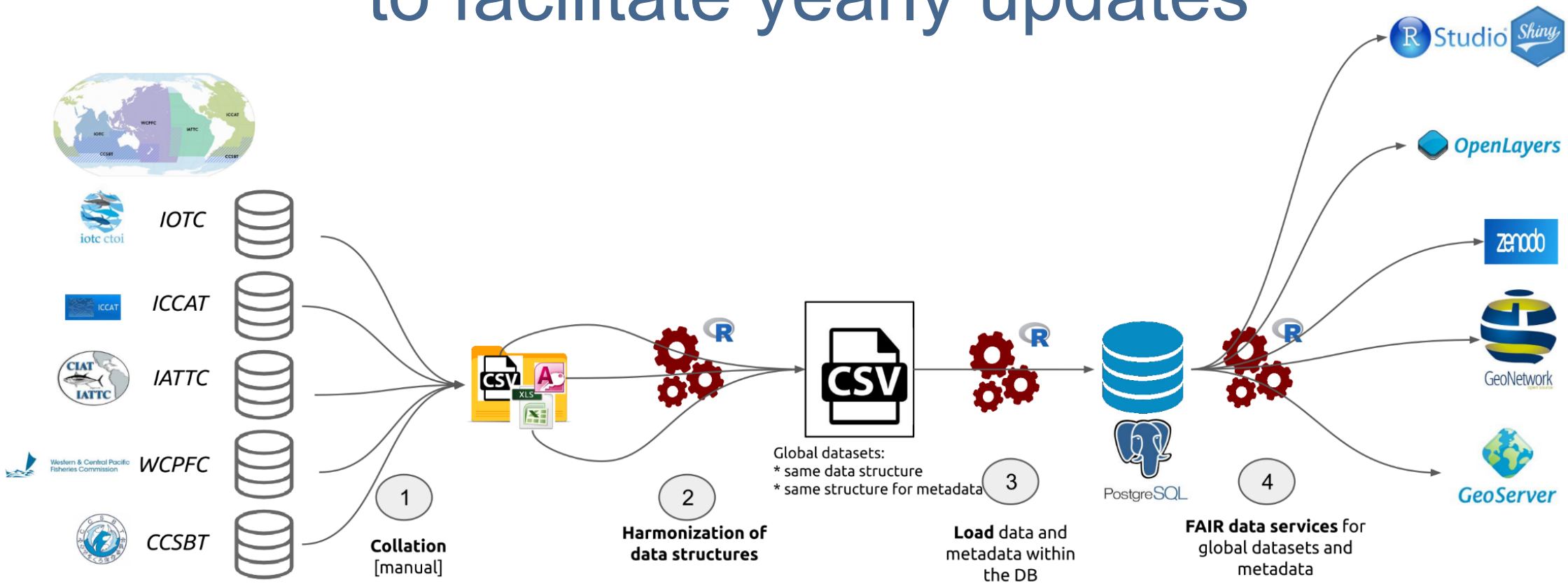
Tuna Atlas: a FAIR workflow to facilitate yearly updates



5 Tuna RFMOs websites (public domain datasets)

VRE

Shared repositories | **Processing servers** | **Spatial Data Infrastructure (metadata, SQL..)**

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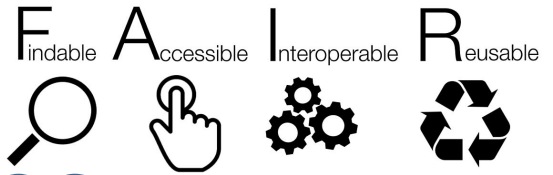
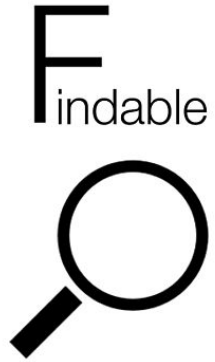
Compliance with FAIR principles



- Fisheries data FAIRification is achieved when making data :
  - **F**indable => provide **discovery metadata** to foster discovery through various searching engines
  - **A**ccessible => through well known **data formats & access protocols**
  - **I**nteroperable => implement widely used **standards in different domains (OGC, Datacite, CWP, TDWG)**
  - **R**eusable => **usage metadata** to understand how data can be used, open data formats…

Fisheries Atlas data are Findable



- **Data discovery** requires:
  - **Syntactic interoperability** by implementing multiple **metadata standards** (OGC 19115, Datacite, Dublin Core):
    - Metadata mapping management
    - DOIs assignment (eg Zenodo, B2Share...)
  - **Semantic interoperability by using controlled vocabularies** (URIs & keywords) rather than free text
  - **Metadata exposed or harvested by different catalogs:**
    - Local or projects catalogs: geonetwork, CKAN...
    - Global search engines: DataCite Search, Google Dataset Search...

Fisheries Atlas data are Accessible

- **Data access requires:**
  - Dataset found with a search engine can be browsed and filtered before downloading by exploring:
    - Spatial dimension with a **Web mapping interface**
    - Other dimensions with a set of indicators gathered on an **interactive dashboard**
  - **Main data formats & related protocols relevant for the community are used:**
    - Simple download (by http) of widely used formats (CSV, Shapefile...)
    - Programmatic access with standardized protocols / Web services for (data) scientists, e.g.:
      - SQL access,
      - OGC: GML & WFS, WCS or NetCDF & OPeNDAP => libraries for all languages

Fisheries Atlas data are Interoperable

- **Data interoperability is a key issue requiring the compliance with multiple standards:**
  - **Current standards:**
    - Dublin Core & DataCite (DOI)
    - OGC for spatial (meta-)data formats & access protocols
    - CWP for fisheries data
  - **Next steps:**
    - EML + Darwin Core for ecological datasets
    - SDMX for statistical datasets

Fisheries Atlas data are Reusable

- **Data can be reused and cited because we provide :**
  - **Rich usage metadata (beyond discovery metadata) to explain how data can be used properly:**
    - Description of the **data structure** with a data dictionary
    - **Quality** (protocols...) and **Provenance**
    - Ultimately writing a **data paper** to better describe each dataset
  - **DOIs to foster data citation:**
    - DOI should be displayed in metadata sheets, in the viewer…
    - Proper citation and use with proper licensing
  - **Open Science: the R workflow (on github) and data can be**
    - **checked, replicated** => Tuna Atlas data provenance is crystal clear.
    - **customized** by tuning the parametrization of Tuna Atlas R scripts.

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Activities

- Enable an **operational web Fisheries Atlas**
  - Gathering multiple datasources…
    - Fisheries datasets (Catch & Effort, surveys, etc)
    - Other relevant data (if FAIRly available): vessel trajectories, tagging/biological/ecological data, environmental data, etc.
  - Handled and maintained:
    - By different institutions
    - In heterogeneous way

      data ***structures, formats***, ***stores***, ***locations***

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Activities

- Set-up a **common methodology** to enable FAIR data flows
  - Use of international standards for (meta)data **interoperability**
  - Coherence with EC INSPIRE directive
  - Cross-domain: broader scope than thematic e-infrastructures

- Our vision
  - No 'FAIRification' possible without standards
  - No real sustainability without standards: methodology first, technology after
    By nature, the technology becomes obsolete; the methodology continues
  - Data access should be **metadata-driven**: Are we FAIR or just.. F(lying) in the AIR?
  - Standards are a cornerstone for FAIR DMPs and a sustainable EOSC vision

- Backed up by Blue-Cloud strategical objectives
  - ISO 19115/19139 common metadata model / OGC catalogue service for the web (CSW) for discovery
  - OGC data services (WMS, WFS and WCS) for viewing and distribution

Activities

To exploit existing data flows (from Blue-Cloud data providers and beyond) and if not possible, FAIRify some of them, as proof-of-concept.

Multiple constraints and challenges

- IT constraints…
  - Protocol security issues: http vs. https
  - Origin security issues: CORS, Tainted canvas images
- Backed up by institutional constraints / policies (or not)
  - Lack of openess, accounting requirements
  - Lack of willingness to share data using open protocols
  - (Un)FAIR metadata driving: metadata with no data access endpoints, or redirects to user web-forms
- Lack of consideration of the importance of standards
  - Dismissal of standard protocols in favour of trendy technologies
  - Prevalence of system accounting / business considerations

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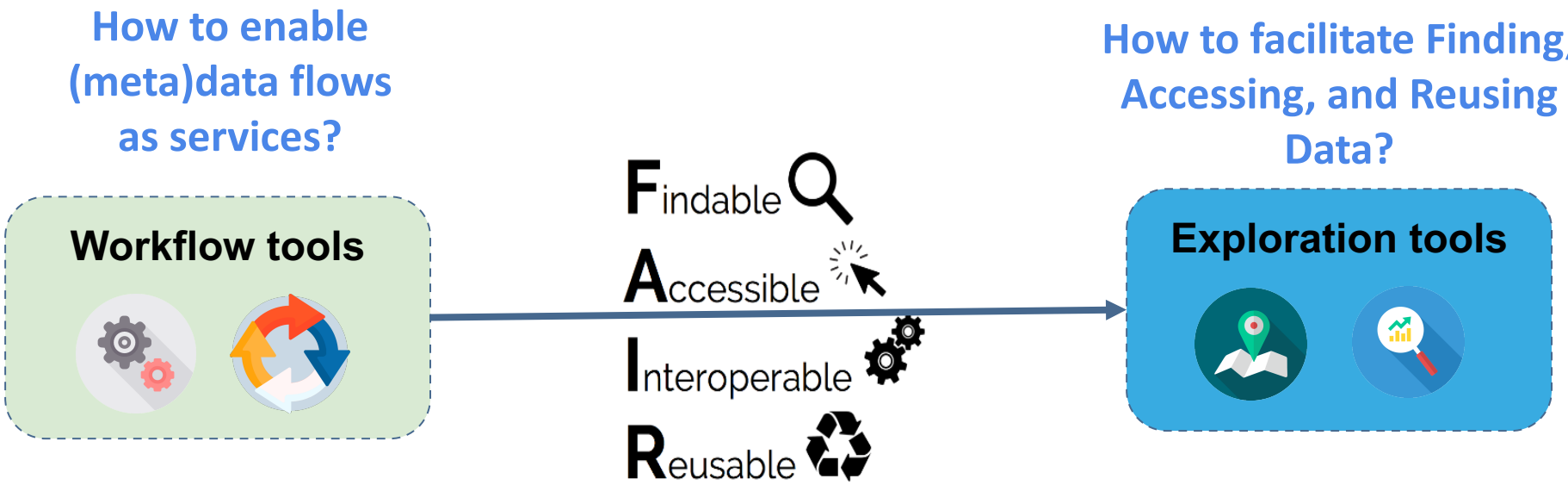
Activities

- Build on and Enhance existing tools
  - Open-source software projects
  - Metadata-driven **Workflow** and **Exploration** tools



Tools

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geoflow R package

Orchestrate
- **Data processings**
- **Turnkey actions** (meta/data production / publication, data upload, OGC services enabling)

Automate
- Avoid web-forms
- Increased reproducibility
- Simplified use of standards
- Multiply (meta)data dissemination endpoints from a single source

Extend
- Plug in-house metadata sources (eg database)
- Plug in-house actions

Findable
Accessible
Interoperable
Reusable

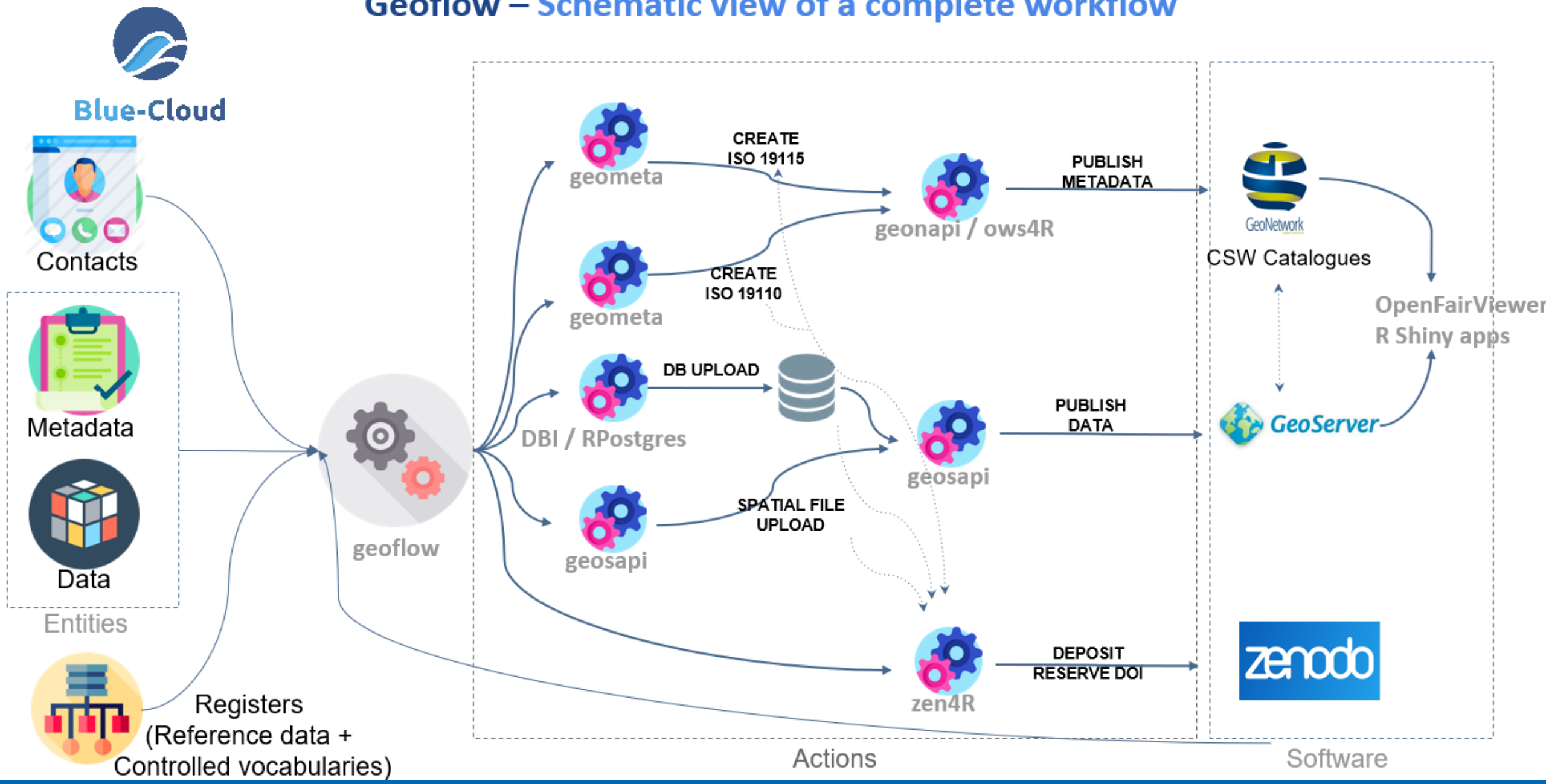
OpenFairViewer

Metadata driven
- Rely on OGC Catalogue to explore datasets:
  - Dataset metadata → **Find**
  - Structural metadata → **Query**
- Access data through OGC services exposed in metadata:

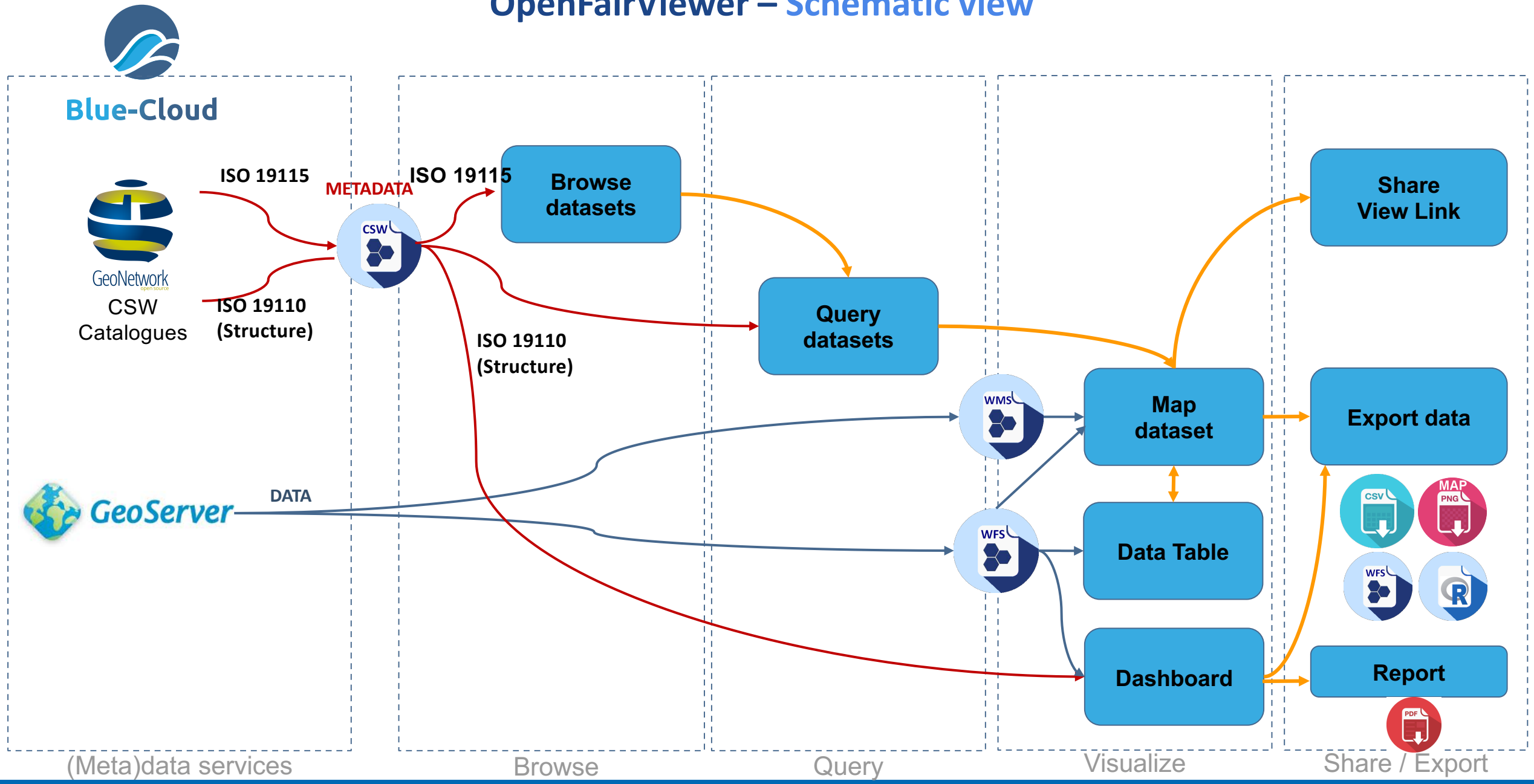
Visualization
Maps **Table** **Dashboard**

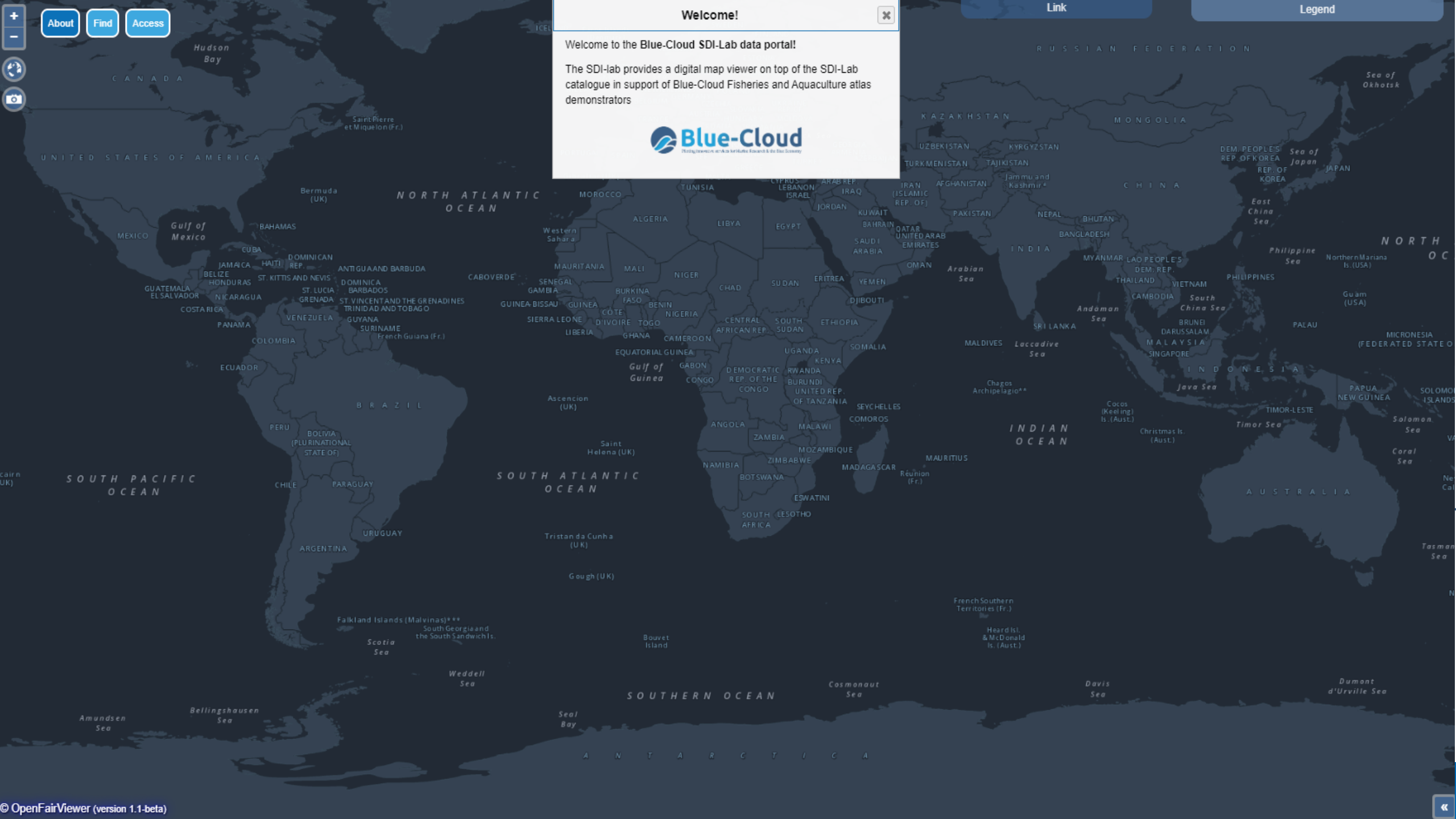
Share/Export

Geoflow – Schematic view of a complete workflow



OpenFairViewer – Schematic view




About
Find
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Welcome!
Welcome to the Blue-Cloud SDI-Lab data portal!
The SDI-lab provides a digital map viewer on top of the SDI-Lab catalogue in support of Blue-Cloud Fisheries and Aquaculture atlas demonstrators
Blue-Cloud
NORTH ATLANTIC OCEAN
SOUTH ATLANTIC OCEAN
SOUTH PACIFIC OCEAN
INDIAN OCEAN
SOUTHERN OCEAN
ANTARCTICA
CANADA
UNITED STATES OF AMERICA
RUSSIAN FEDERATION
BRAZIL
AUSTRALIA
INDONESIA
CHINA
INDIA
Gulf of Mexico
Gulf of Guinea
Hudson Bay
Bermuda (UK)
Saint Pierre et Miquelon (Fr.)
Ascencion (UK)
Saint Helena (UK)
Tristan da Cunha (UK)
Gough (UK)
Falkland Islands (Malvinas)***
South Georgia and the South Sandwich Is.
Bouvet Island
Heard Isl. & McDonald Is. (Aust.)
French Southern Territories (Fr.)
Sea of Okhotsk
Sea of Japan
East China Sea
Philippine Sea
Arabian Sea
Andaman Sea
Laccadive Sea
Java Sea
Timor Sea
Coral Sea
Tasman Sea
Weddell Sea
Scotia Sea
Amundsen Sea
Bellingshausen Sea
Cosmonaut Sea
Davis Sea
Dumont d'Urville Sea
Seal Bay
Chagos Archipelago**
Cocos (Keeling) Is. (Aust.)
Christmas Is. (Aust.)
Northern Mariana Is. (USA)
Guam (USA)
Palau
Micronesia (Federated States of)
Papua New Guinea
Solomon Islands
Solomon Sea
Timor-Leste
Brunei Darussalam
Malaysia
Singapore
Thailand
Cambodia
Vietnam
Myanmar
Lao People's Dem. Rep.
Philippines
Dem. People's Rep. of Korea
Rep. of Korea
Japan
Mongolia
Kazakhstan
Uzbekistan
Kyrgyzstan
Tajikistan
Turkmenistan
Afghanistan
Pakistan
Nepal
Bhutan
Bangladesh
Sri Lanka
Maldives
Jammu and Kashmir*
Iran (Islamic Rep. of)
Iraq
Jordan
Lebanon
Israel
Cyprus
Arab Rep.
Kuwait
Bahrain
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United Arab Emirates
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Somalia
Sudan
South Sudan
Central African Rep.
Chad
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Eswatini
South Africa
Lesotho
Seychelles
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Madagascar
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Réunion (Fr.)
Mexico
Cuba
Haiti
Dominican Rep.
Jamaica
Belize
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Guatemala
El Salvador
Nicaragua
Costa Rica
Panama
Colombia
Venezuela
Guyana
Suriname
French Guiana (Fr.)
Ecuador
Peru
Bolivia (Plurinational State of)
Chile
Paraguay
Uruguay
Argentina
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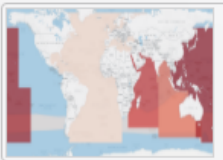
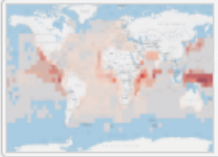
19 datasets



Global annual catch of tuna, tuna-like and shark species (1918-01-01 - 2016-12-31) (IRD level 0)

Global monthly catch of tuna and tuna-like species (1950-01-01 - 2016-12-31) aggregated by statistical squares of 1° or 5° longitude and latitude (IRD level 0)



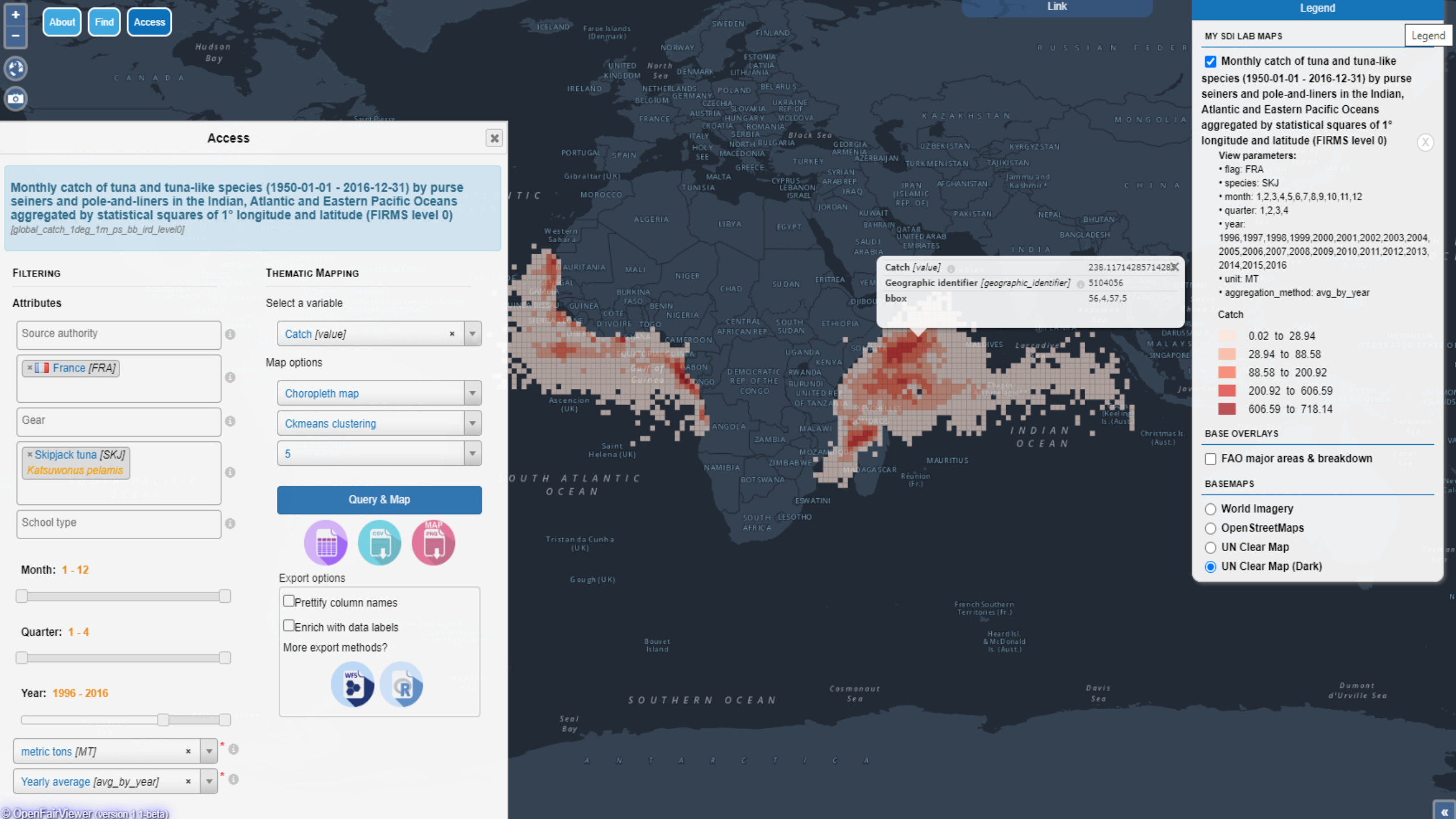
Global monthly catch of tuna and tuna-like species (1950-01-01 - 2016-12-31) aggregated by statistical squares of 5° longitude and latitude (IRD level 0)

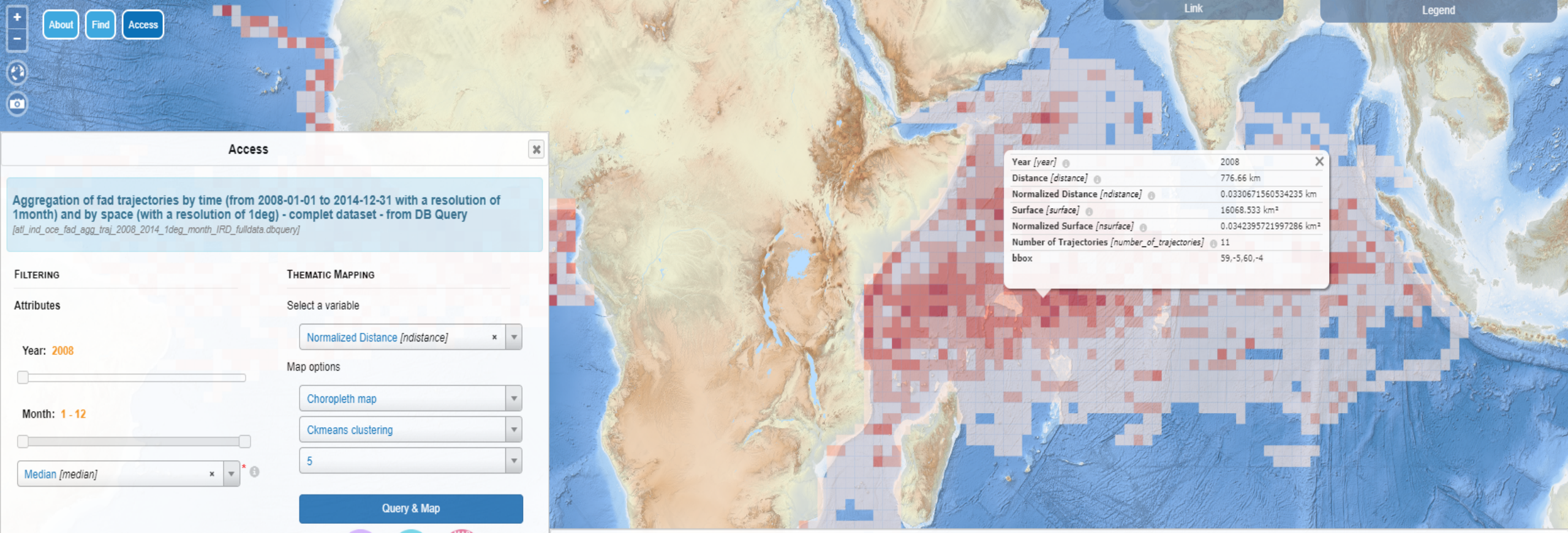
Monthly catch of tuna and tuna-like species (1950-01-01 - 2016-12-31) by purse seiners and pole-and-liners in the Indian, Atlantic and Eastern Pacific Oceans aggregated by statistical squares of 1° longitude and latitude (FIRMS level 0)

FAO aquatic species distribution map of Thunnus orientalis (Pacific bluefin tuna)

← « 1 2 3 4 » →

Show 5 datasets


About
Find
Access
Link
Legend
Access
Monthly catch of tuna and tuna-like species (1950-01-01 - 2016-12-31) by purse seiners and pole-and-liners in the Indian, Atlantic and Eastern Pacific Oceans aggregated by statistical squares of 1° longitude and latitude (FIRMS level 0)
[global_catch_1deg_1m_ps_bb_ird_level0]
FILTERING
Attributes
Source authority
France [FRA]
Gear
Skipjack tuna [SKJ]
Katsuwonus pelamis
School type
Month: 1 - 12
Quarter: 1 - 4
Year: 1996 - 2016
metric tons [MT]
Yearly average [avg_by_year]
THEMATIC MAPPING
Select a variable
Catch [value]
Map options
Choropleth map
Ckmeans clustering
5
Query & Map
Export options
Prettify column names
Enrich with data labels
More export methods?
Catch [value] 238.11714285714283
Geographic identifier [geographic_identifier] 5104056
bbox 56,4,57,5
MY SDI LAB MAPS
Legend
Monthly catch of tuna and tuna-like species (1950-01-01 - 2016-12-31) by purse seiners and pole-and-liners in the Indian, Atlantic and Eastern Pacific Oceans aggregated by statistical squares of 1° longitude and latitude (FIRMS level 0)
View parameters:
• flag: FRA
• species: SKJ
• month: 1,2,3,4,5,6,7,8,9,10,11,12
• quarter: 1,2,3,4
• year: 1996,1997,1998,1999,2000,2001,2002,2003,2004,2005,2006,2007,2008,2009,2010,2011,2012,2013,2014,2015,2016
• unit: MT
• aggregation_method: avg_by_year
Catch
0.02 to 28.94
28.94 to 88.58
88.58 to 200.92
200.92 to 606.59
606.59 to 718.14
BASE OVERLAYS
FAO major areas & breakdown
BASEMAPS
World Imagery
OpenStreetMaps
UN Clear Map
UN Clear Map (Dark)
INDIAN OCEAN
SOUTH ATLANTIC OCEAN
SOUTHERN OCEAN
© OpenFairViewer (version 1.1-beta)



Access

Aggregation of fad trajectories by time (from 2008-01-01 to 2014-12-31 with a resolution of 1month) and by space (with a resolution of 1deg) - complet dataset - from DB Query

[atl_ind_oce_fad_agg_traj_2008_2014_1deg_month_IRD_fulldata.dbquery]

Filtering

Attributes

Year: 2008

Month: 1 - 12

Median *[median]* *

Thematic Mapping

Select a variable

Normalized Distance *[ndistance]*

Map options

Choropleth map

Ckmeans clustering

5

Query & Map

Export options

Tabular data

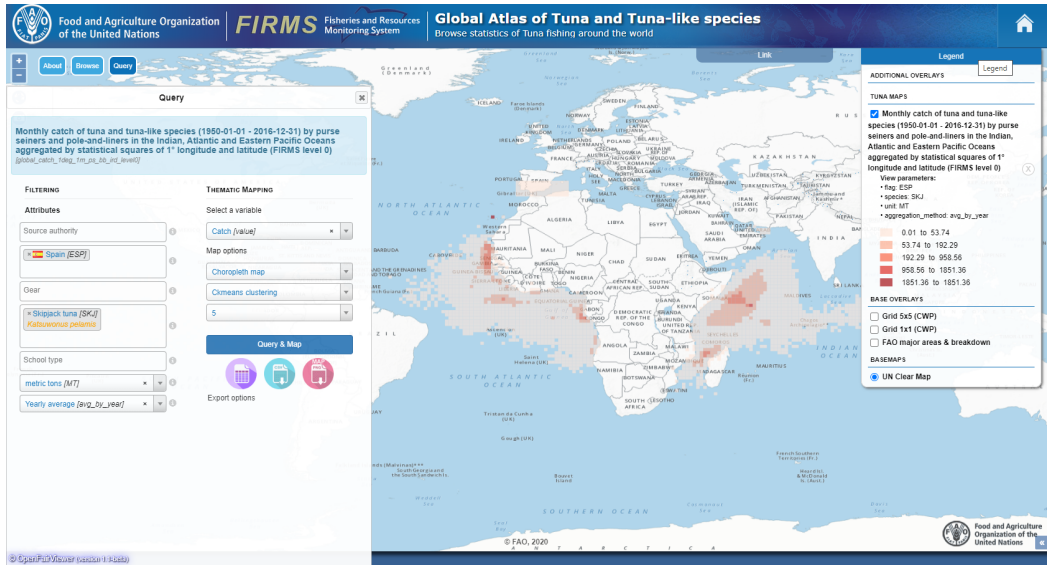
Show 5 entries

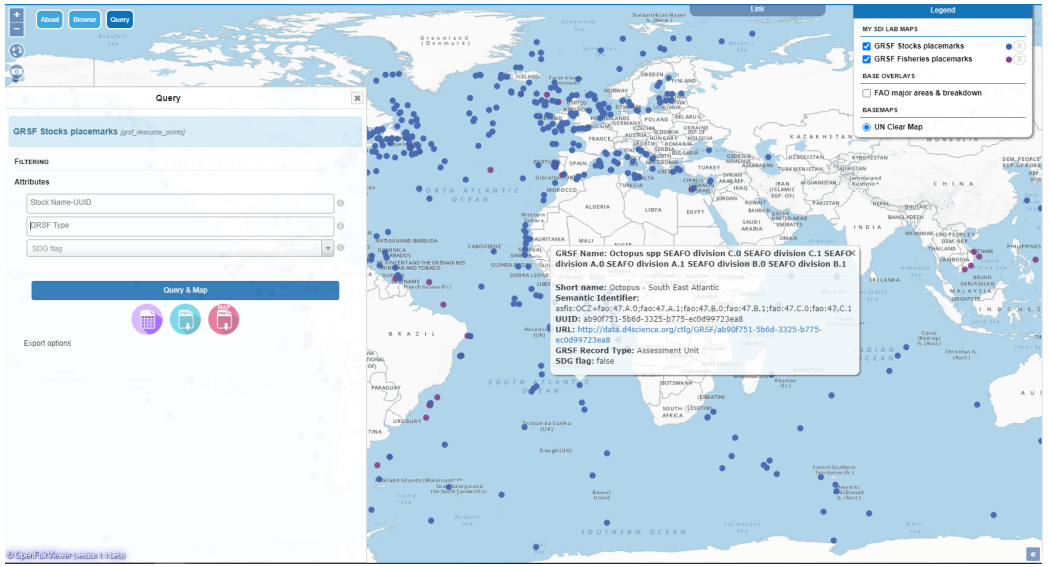
Year [Code]	Year [Label]	Distance [Code]	Normalized Distance [Code]	Surface [Code]	Normalized Surface [Code]	Number of Trajectories [Code]	geometry
2008		120.805	0.0191496754676496	2422.737	0.0189224279621587	1	
2008		124.741	0.0197735993337203	2397.485	0.0187252009619104	1	
2008		132.278	0.020968343789659	3043.069	0.0237674390313015	1	
2008		29.202	0.0046290205124482	751.04	0.00586588651459058	1	
2008		86.874	0.0137710269159107	1736.923	0.0135659794452788	1	

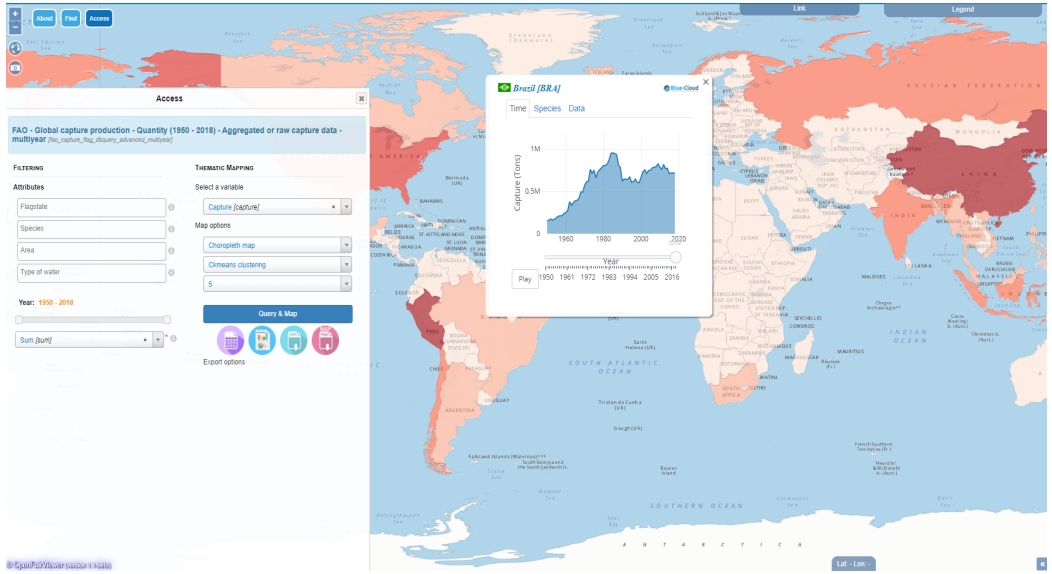
Showing 1 to 5 of 2,533 entries

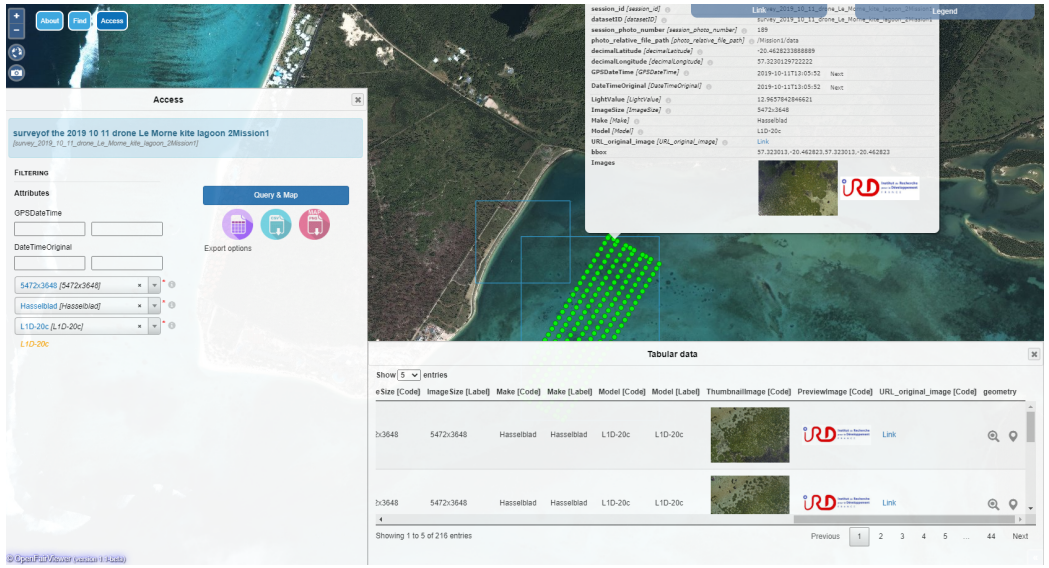
Previous 1 2 3 4 5 ... 507 Next

Blue-Cloud


Food and Agriculture Organization of the United Nations
FIRMS
Fisheries and Resources Monitoring System
Global Atlas of Tuna and Tuna-like species
Browse statistics of Tuna fishing around the world
About
Browse
Query
Query
Monthly catch of tuna and tuna-like species (1950-01-01 - 2016-12-31) by purse seiners and pole-and-liners in the Indian, Atlantic and Eastern Pacific Oceans aggregated by statistical squares of 1° longitude and latitude (FIRMS level 0)
FILTERING
Attributes
Source authority
Spain [ESP]
Gear
Skipjack tuna [SKJ]
Katsuwonus pelamis
School type
metric tons [MT]
Yearly average [avg_by_year]
THEMATIC MAPPING
Select a variable
Catch [value]
Map options
Choropleth map
Clkmeans clustering
5
Query & Map
Export options
Legend
ADDITIONAL OVERLAYS
TUNA MAPS
Monthly catch of tuna and tuna-like species (1950-01-01 - 2016-12-31) by purse seiners and pole-and-liners in the Indian, Atlantic and Eastern Pacific Oceans aggregated by statistical squares of 1° longitude and latitude (FIRMS level 0)
View parameters:
• flag: ESP
• species: SKJ
• unit: MT
• aggregation_method: avg_by_year
0.01 to 53.74
53.74 to 192.29
192.29 to 958.56
958.56 to 1851.36
1851.36 to 1851.36
BASE OVERLAYS
Grid 5x5 (CWP)
Grid 1x1 (CWP)
FAO major areas & breakdown
BASEMAPS
UN Clear Map
© FAO, 2020
Food and Agriculture Organization of the United Nations


About
Browse
Query
Query
GRSF Stocks placemarks
FILTERING
Attributes
Stock Name-UUID
GRSF Type
SDG flag
Query & Map
Export options
Legend
MY SDI LAB MAPS
GRSF Stocks placemarks
GRSF Fisheries placemarks
BASE OVERLAYS
FAO major areas & breakdown
BASEMAPS
UN Clear Map
GRSF Name: Octopus spp SEAFO division C.0 SEAFO division C.1 SEAFO division A.0 SEAFO division A.1 SEAFO division B.0 SEAFO division B.1
Short name: Octopus - South East Atlantic
Semantic Identifier:
asfis:OCZ+fao:47.A.0;fao:47.A.1;fao:47.B.0;fao:47.B.1;fao:47.C.0;fao:47.C.1
UUID: ab90f751-5b6d-3325-b775-ec0d99723ea8
URL: http://data.d4science.org/ctlg/GRSF/ab90f751-5b6d-3325-b775-ec0d99723ea8
GRSF Record Type: Assessment Unit
SDG flag: false


About
Find
Access
Access
FAO - Global capture production - Quantity (1950 - 2018) - Aggregated or raw capture data - multiyear
FILTERING
Attributes
Flagstate
Species
Area
Type of water
Year: 1950 - 2018
Sum [sum]
THEMATIC MAPPING
Select a variable
Capture [capture]
Map options
Choropleth map
Clkmeans clustering
5
Query & Map
Export options
Brazil [BRA]
Time
Species
Data
Capture (Tons)
1M
0.5M
0
1960
1980
2000
2020
Year
Play
1950 1961 1972 1983 1994 2005 2016


About
Find
Access
Access
surveyof the 2019 10 11 drone Le Morne kite lagoon 2Mission1
FILTERING
Attributes
GPSDateTime
DateTimeOriginal
5472x3648 [5472x3648]
Hasselblad [Hasselblad]
L1D-20c [L1D-20c]
Query & Map
Export options
Tabular data
Show 5 entries
Showing 1 to 5 of 216 entries
Previous
Next

Blue-Cloud

Agenda

- Opening and introduction (Trust-IT Services – F. Spagnoli)
- Demonstrator Vision and Mission (FAO – A.E. Nieblas)
- Fisheries Atlas Objectives and tasks (IRD – J.Barde)
- Fisheries Atlas Activities and Tools (FAO – E.Blondel)
- **Global Record of Stocks and Fisheries (FORTH – Y. Marketakis, FAO – A.Gentile)**
- Conclusion and Discussion (A. Ellenbroek & F. Spagnoli)

Global Record of Stocks and Fisheries (GRSF)

- A database of **stocks** and **fisheries** inventoried at global level with standard **unique identifiers**

- Sources of information: **FIRMS** - Fisheries and Resources Monitoring System, **FishSource**, and **RAM** Legacy Stock Assessment Database

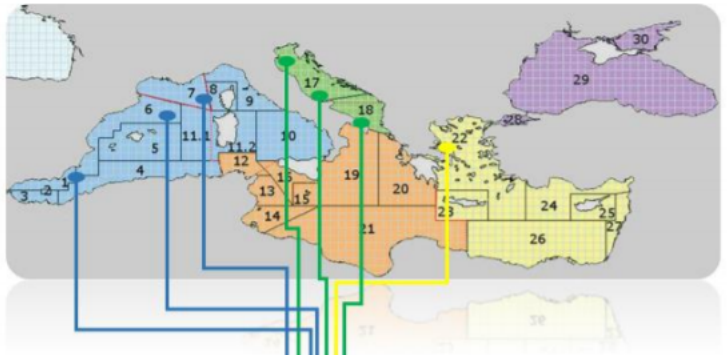
- A tool to support:
  - SDG 14.4.1 “Proportion of fish stocks within biologically sustainable levels”
  - Traceability and ecolabelling schemes connecting seafood industries and consumers to the status of stocks and fisheries

Global Record of Stocks and Fisheries

- An **aggregator** of global knowledge from 3 top institutes
- Data Integration through the construction of a **Semantic Knowledge Base**
- Publicly accessible; **Global Unique Identifiers**
- Ready to be **extended** with external resources

  (e.g. Food data, oceanographic data)
- Re-uses many components from parallel task
  - Blue Cloud enables **Reusable, Interoperable, Scalable data sharing**

Global Record of Stocks and Fisheries



Anchovy - Adriatic Sea
Anchovy - Aegean Sea
Anchovy - Gulf of Lion
Anchovy - Northern Adriatic Sea
Anchovy - Northern Alboran
Anchovy - Northern Spain
Anchovy - Southern Adriatic Sea

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

Stock name | Human readable semantic code | Machine readable code | QR code

Powered by D4SCIENCE INFRASTRUCTURE

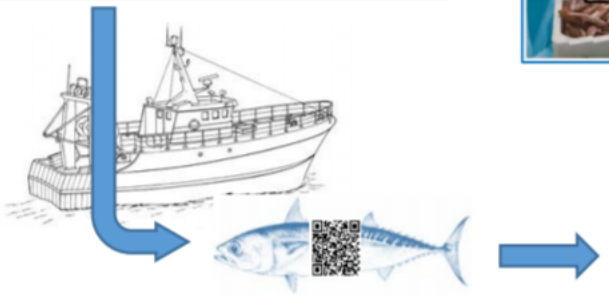
National Research Council of Italy

FORTH INSTITUTE OF COMPUTER SCIENCE

i-marine

https://i-marine.d4science.org/web/grsf/data-catalogue

- **Stock status** (reported at national, regional level) - SDG 14.4.1 indicator
- **Traceability schemes**



Traceability along value chain

Global Record of Stocks and Fisheries

Blue-Cloud

Global Record of Stock and Fisheries (GRSF) | GRSF Catalogue | Map Viewer | GRSF Definitions

About | Find | Access

Link | Legend

Report an issue

GRSF Name: Strombus gigas - Antigua and Barbuda

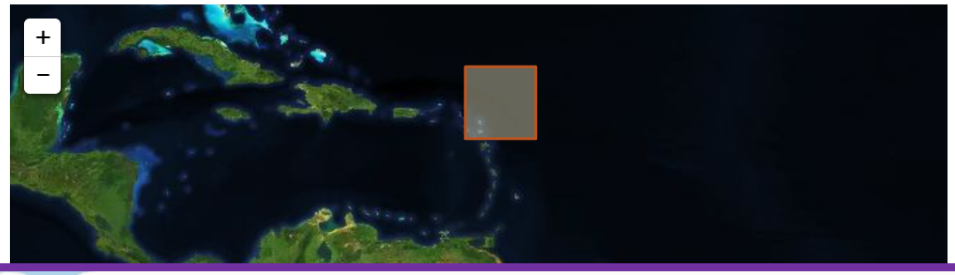
Short name: Queen conch - Antigua
Semantic Identifier: asfis:COO+eez:ATG
UUID: a2c753e5-a5ee-338a-af77-51e1c14c20a3
URL: http://data.d4science.org/ctlg/GRSF/a2c753e5-a5ee-338a-af77-51e1c14c20a3
GRSF Record Type: assessment unit
SDG flag

Record | Groups

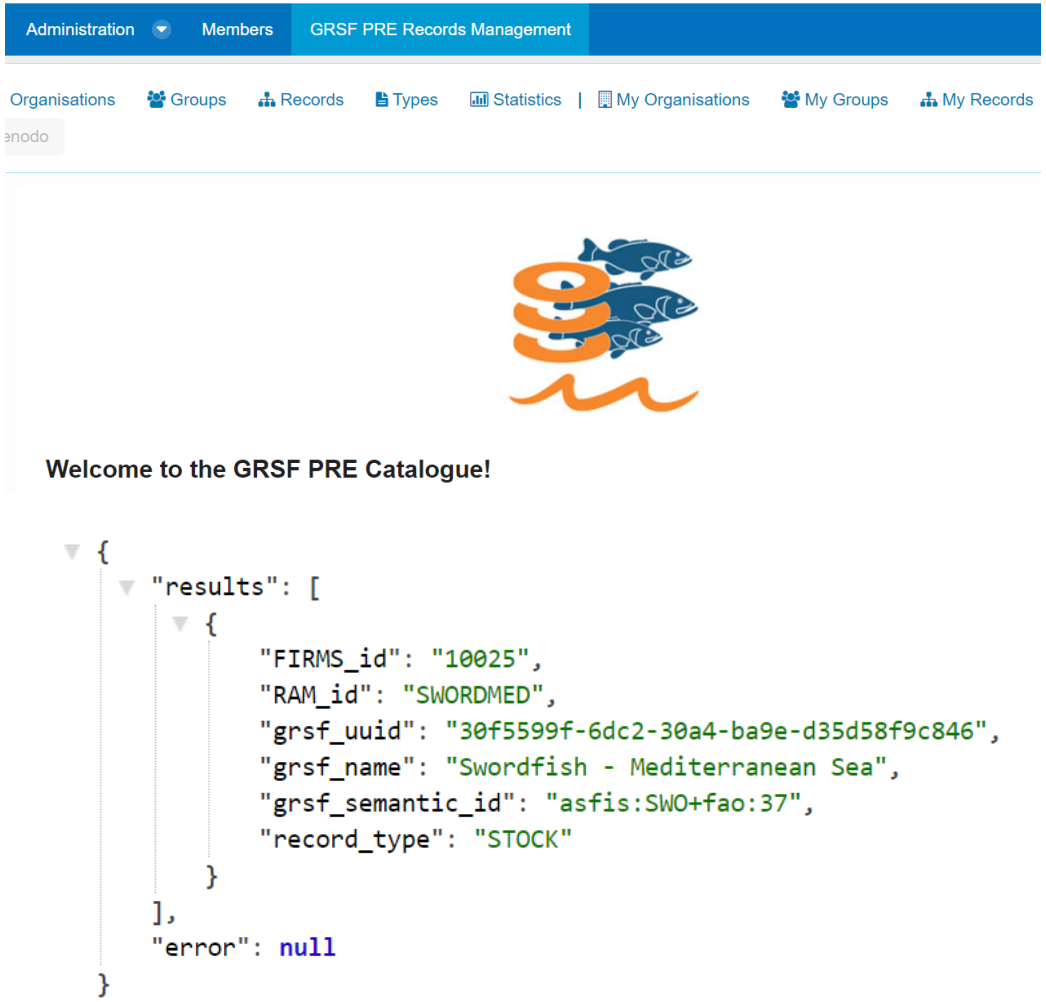
Strombus gigas - Antigua and Barbuda

Short Name: Queen conch - Antigua
GRSF Semantic identifier: asfis:COO+eez:ATG
Record URL: http://data.d4science.org/ctlg/GRSF/a2c753e5-a5ee-338a-af77-51e1c14c20a3

Dataset extent



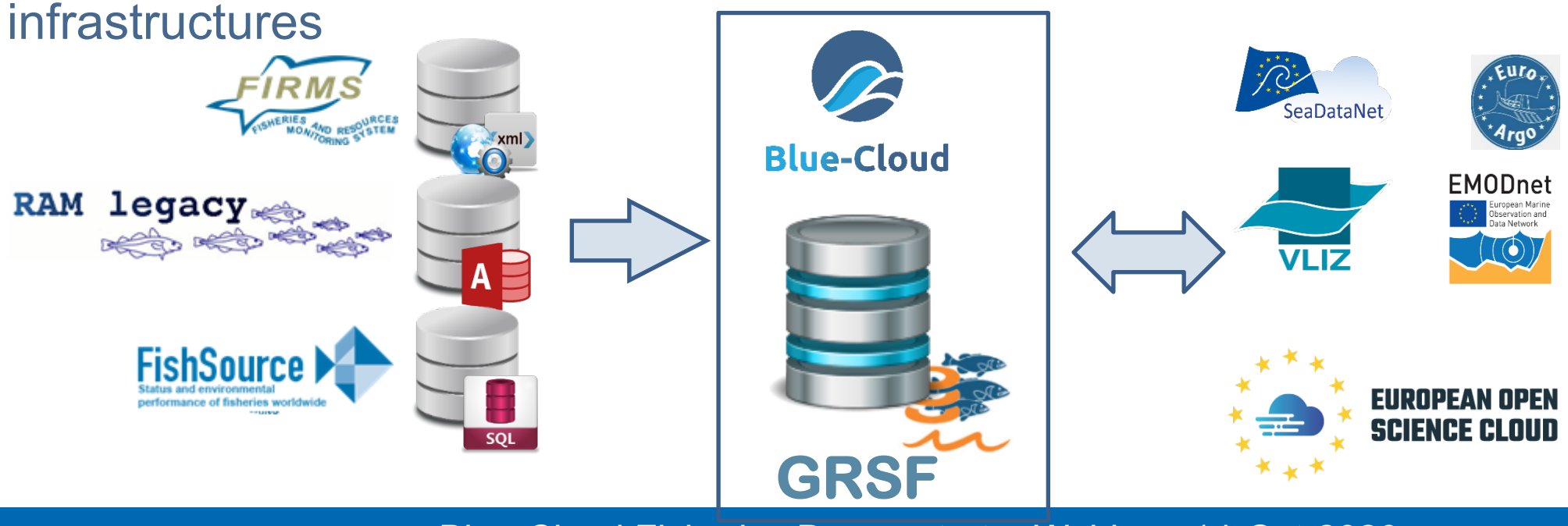
Global Record of Stocks and Fisheries



- **GRSF PRE**: a new VRE developed under the **BlueCloud** for:
- **Testing/Staging** new data and software
- **Enrichment** of the records with additional data from the BlueCloud, e.g. Food data or other demonstrators
- **Competency Queries** and **APIs** available and more are in progress…

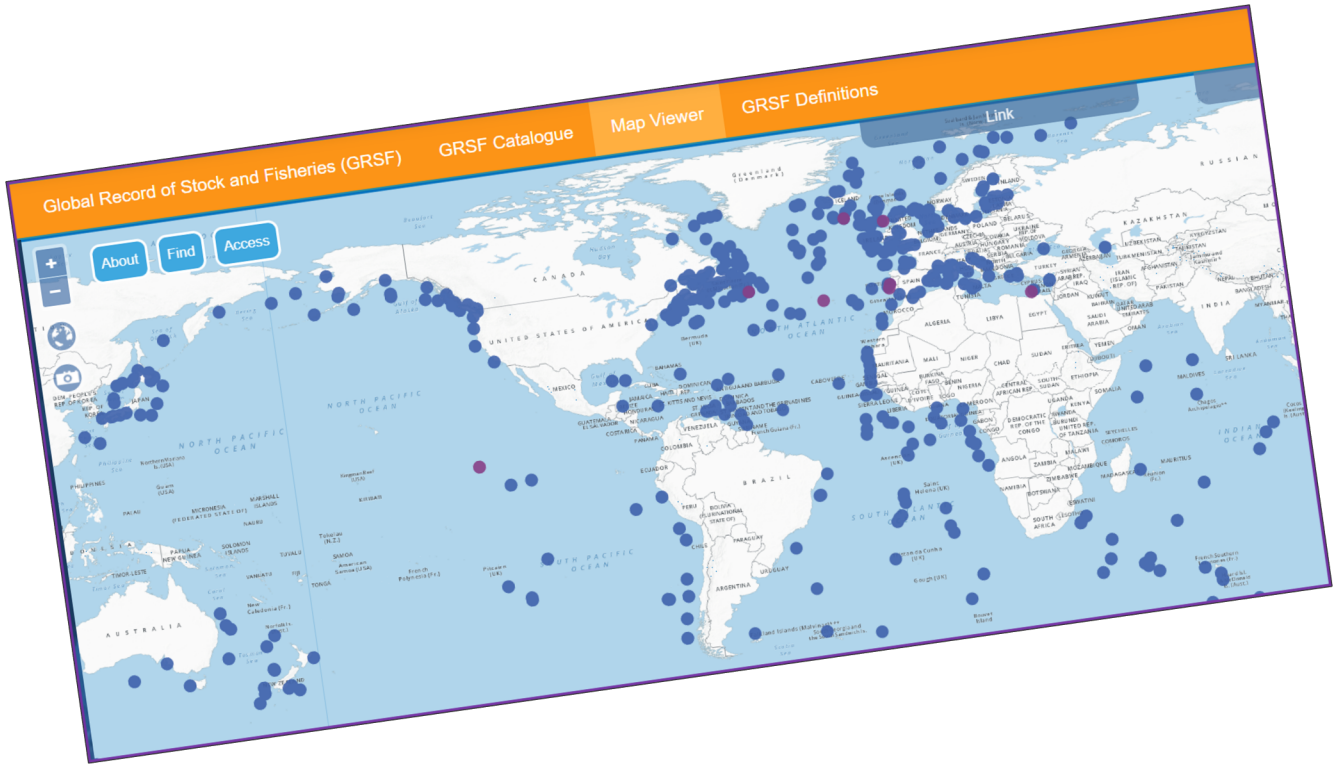
Global Record of Stocks and Fisheries

- The backbone of GRSF is **GRSF Knowledge Base**, a semantic warehouse, built on top of a top level ontology (MarineTLO), that semantically integrates data from the three main sources of GRSF
- BlueCloud Services will "**interconnect**" GRSF with information from external infrastructures



Global Record of Stocks and Fisheries

Visit the GRSF at
https://i-marine.d4science.org/web/grsf/data-catalogue



Blue-Cloud

Blue Cloud Data Access and Processing Services

- **Virtual Research Environment**
  - **To help researchers to collaborate by providing**
    - Harmonize access to various data sets / data sources
    - Discipline-specific tools, such as data analysis, visualization, …
- **The Blue Cloud implementation of VRE's : D4Science**
  - **Developed by CNR, application to «Open Science» paradigm**
  - **To allow**
    - Data Hosting and curation (metadata)
    - Data Analytics and visualization (e.g. geospatial data)
    - Software Dynamic Deployment
    - Resources (data, software, …) controlled sharing and accounting

Blue-Cloud

Agenda

- Opening and introduction (Trust-IT Services – F. Spagnoli)
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- Fisheries Atlas Activities and Tools (FAO – E.Blondel)
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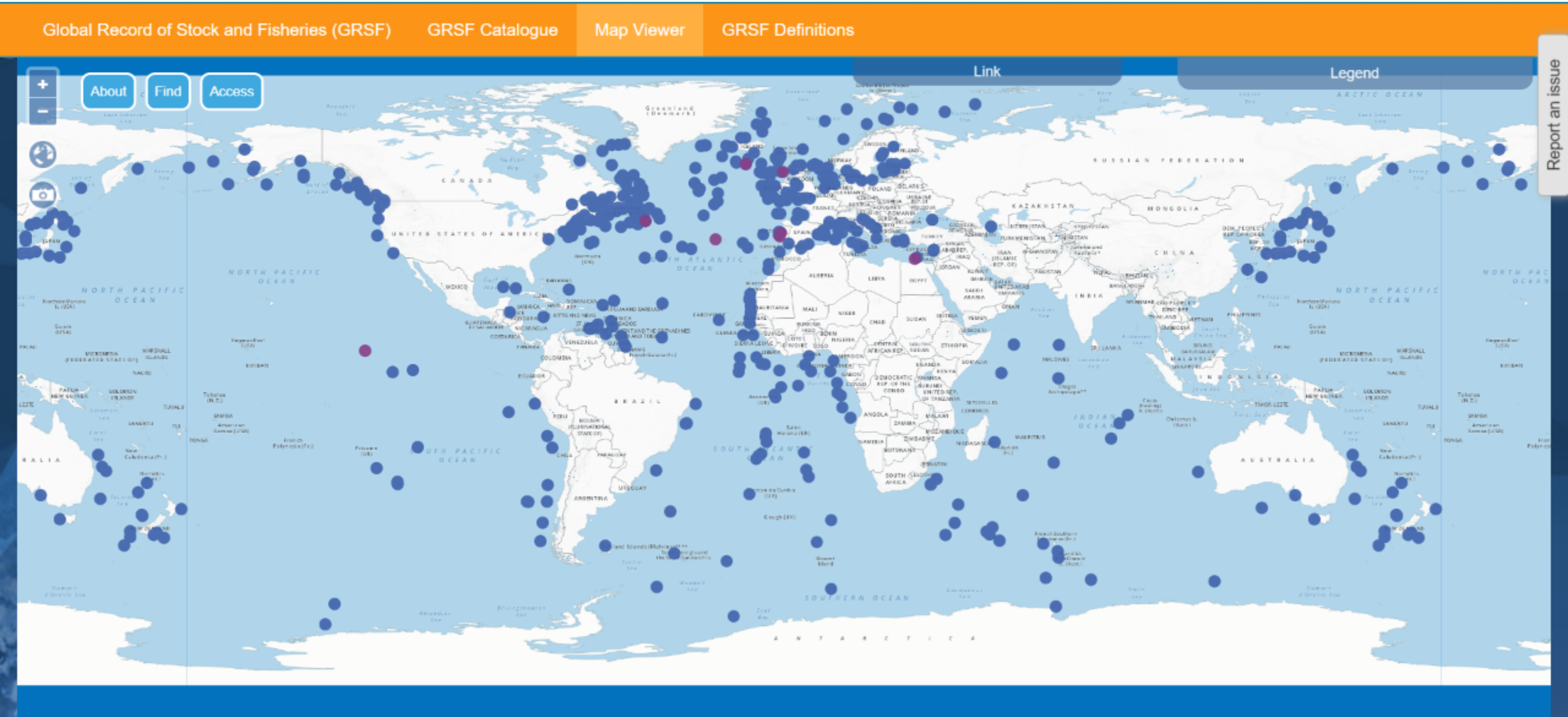
- **Conclusion and Discussion (A. Ellenbroek & F. Spagnoli)**

D4 Science main features

- **Metadata Catalogue** (gCat)
  - to publish and to search collections of metadata for items including data, services, and related information objects
- **Workspace** (Storage Hub)
  - to browse, to upload and to download user's files and folders
- **Data processing platform (named DataMiner)**
  - DataMiner online interfaces (harmonized for users)
  - Integration of new methods/algorithms
- **Spatial Data Infrastructure**
  - Spatial Data Storage and Publishing
  - Spatial Data Discovery and Access
  - SDI Services (OGC Compliant)
- **Integrated Users' Authentication and Authorisation framework**
- **Profile & Social Networking API**
  - to get user information and/or to boost content's reach by making easier to share it

Blue-Cloud

End of the FAIRy tale…



D4Science : some useful links

- **DataMiner overview**: Data Mining Facilities (https://wiki.gcube-system.org/gcube/Data_Mining_Facilities)
- **More about Data Miner (developers oriented) :**
  - Developers website (commonly used APIs, ...): Dev Web Site (https://dev.d4science.org/)
  - Implementation of custom new algorithms for DataMiner: Software Algorithm Importer (https://wiki.gcube-system.org/gcube/Category:Statistical_Algorithms_Importer)
  - Supported languages for new Methods/Algorithms for DataMiner: Create a new project with SAI (https://wiki.gcube-system.org/gcube/Statistical_Algorithms_Importer:_Create_Project)
  - DataMiner online interfaces DataMiner Manager (https://wiki.gcube-system.org/gcube/DataMiner_Manager),
  - Web Processing service: Web Processing Service | OGC (https://www.opengeospatial.org/standards/wps).
- **Spatial Data Infrastructure capabilities**
  - SDI-Service (https://gcube.wiki.gcube-system.org/gcube/SDI-Service),
  - Spatial Data Storage and Publishing (https://gcube.wiki.gcube-system.org/gcube/Spatial_Data_Storage_and_Publishing),
  - Spatial Data Discovery and Access (https://gcube.wiki.gcube-system.org/gcube/Spatial_Data_Discovery_and_Access)

Blue-Cloud

Thank you!

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