



Blue-Cloud

Piloting innovative services for Marine Research & the Blue Economy

Blue-Cloud Demonstrators

Supporting sustainability of global fisheries and aquaculture monitoring 14 December 2021

Presenters: Anton Ellenbroek (FAO of the UN)

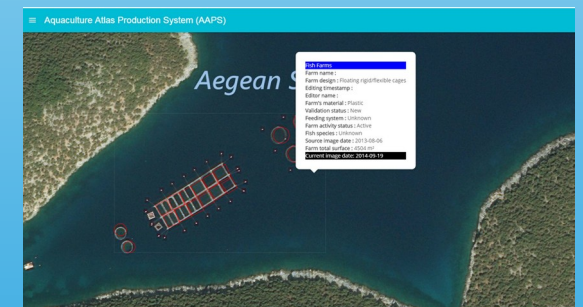
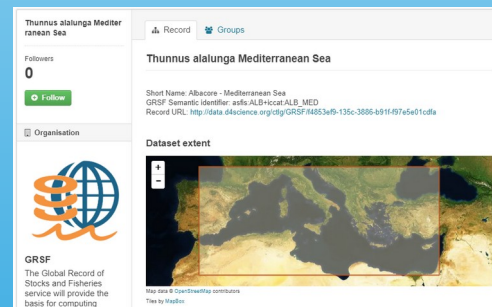
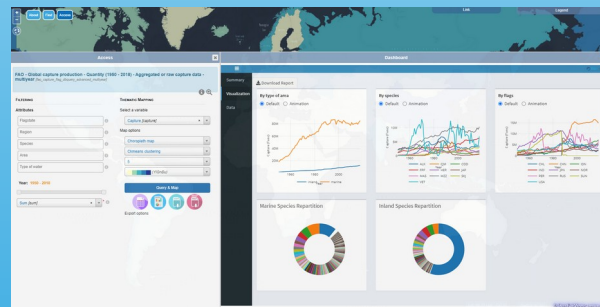
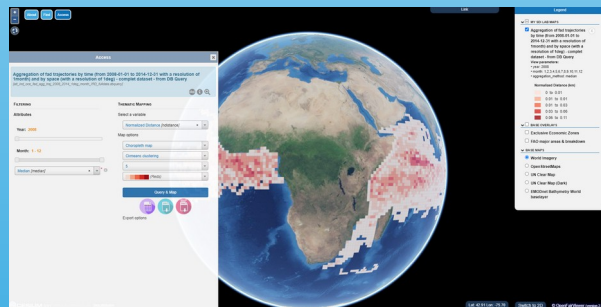
Coauthors: Marc Taconet, Aymen Charef, Aureliano Gentile, Emmanuel Blondel, Alexandre Bennici, Pierfrancesco Tommassino (FAO of the UN), Julien Barde (IRD France), Yannis Marketakis (FORTH, Greece), Emeric Lavergne, Jeremy Augot (CLS) and a few others



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.

A Quick Outline

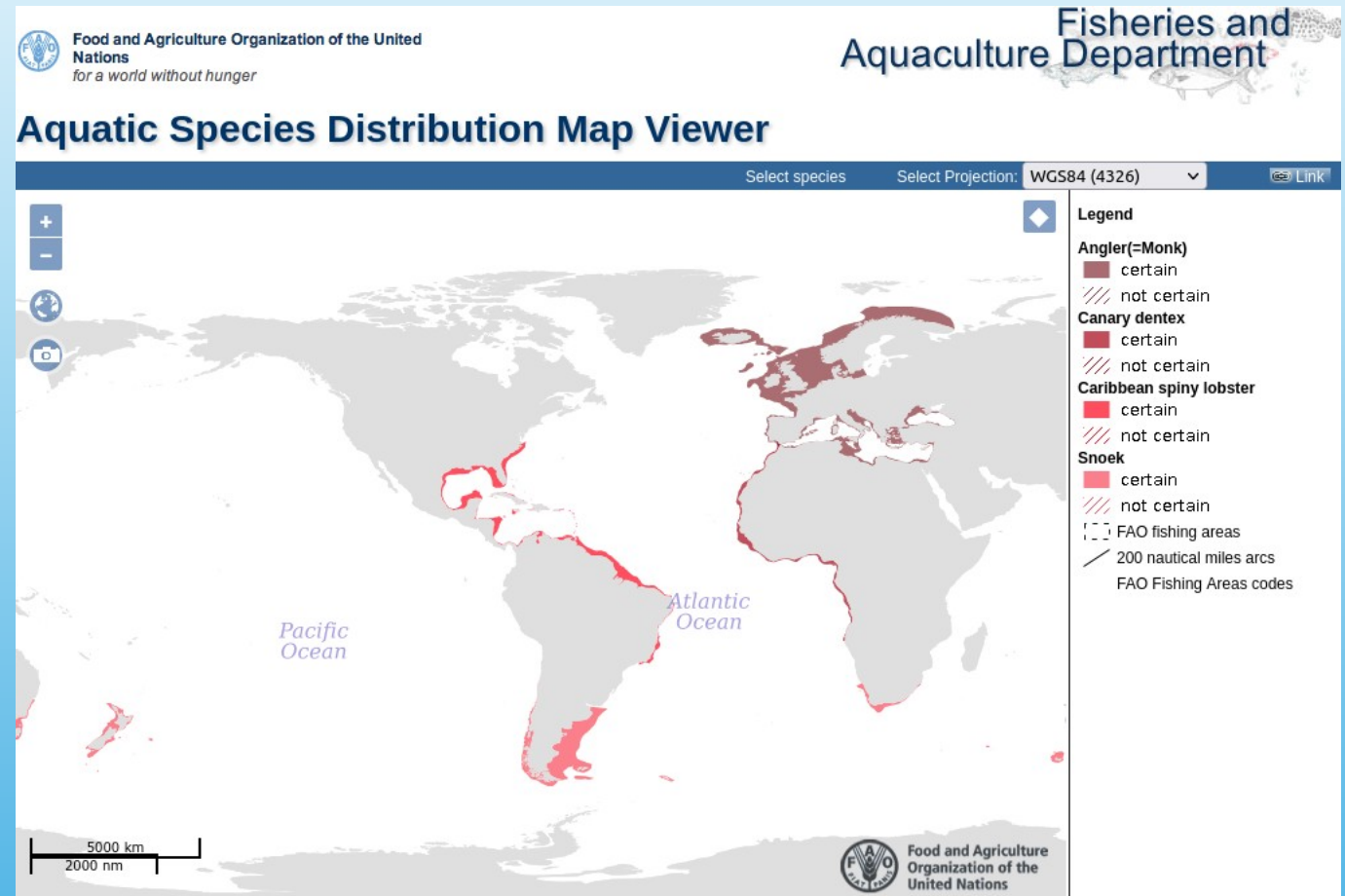
- Examples of FAO Fisheries products
- Examples of Virtual Research Environments (VREs)
 - Global Records of Stocks and Fisheries (GRSF)
 - Spatial data analysis and remote sensing
 - Global Tuna Atlas
 - Sustainable Development Goal Indicator 14.4.1
 - Aquaculture monitoring



FAO Product: Aquatic Species Viewer

<https://www.fao.org/figis/geoserver/factsheets/species.html>

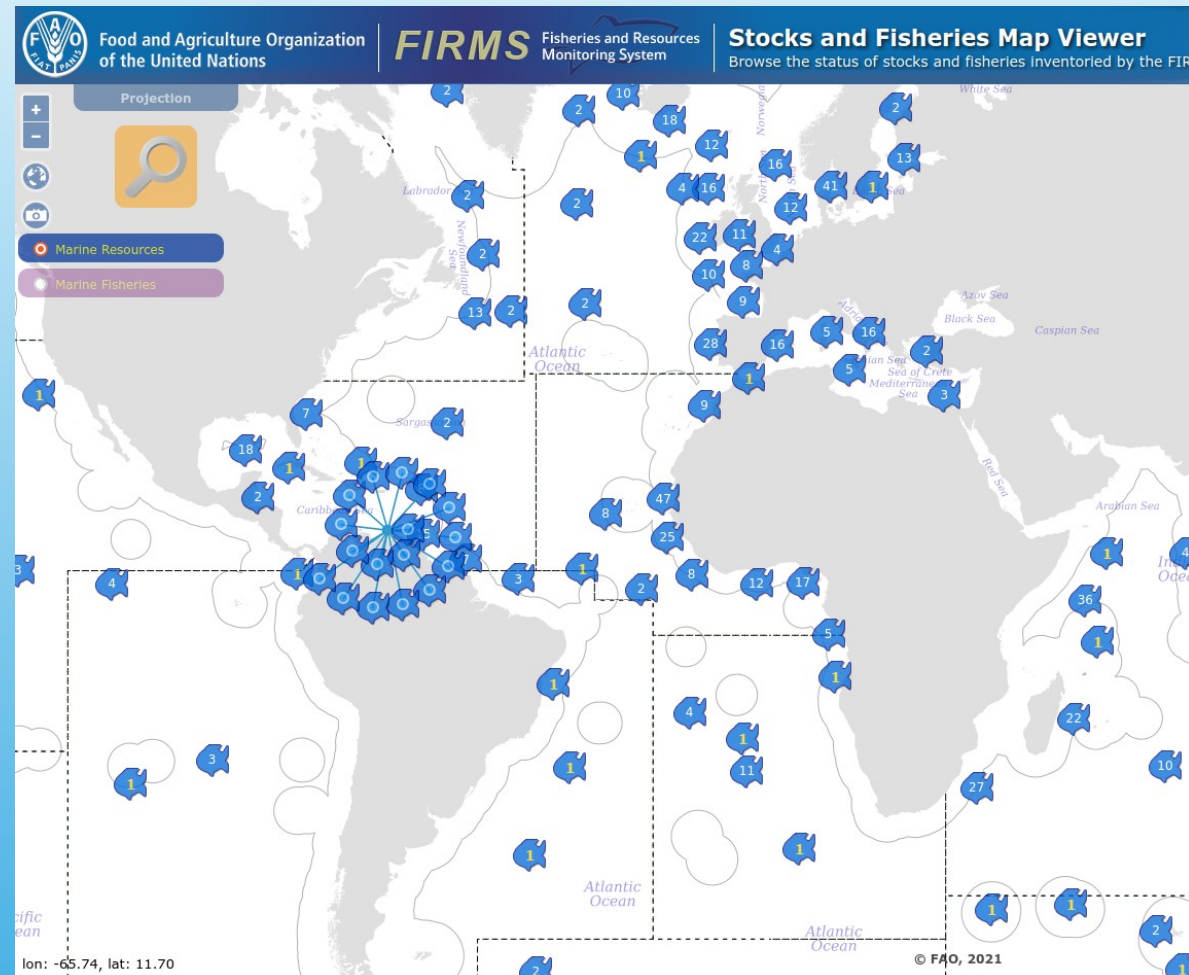
- 924 Expert maps
- Focus on species of commercial interest to fisheries
- GeoNetwork SDI catalog; a big step towards FAIR data



FAO Product: FIRMS Viewer

<http://firms.fao.org/firms/stocks-fisheries-map-viewer>

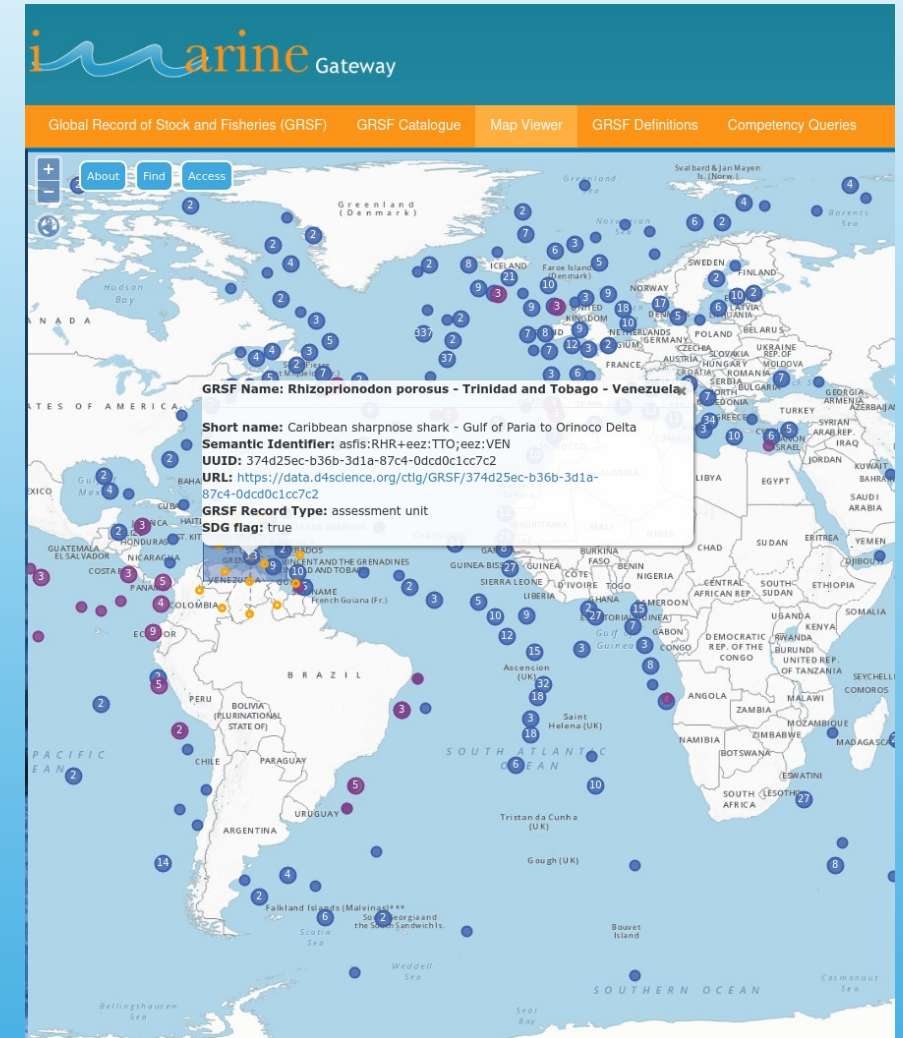
- Adding data on stocks and fisheries
- +1000 Maps, governance and statistics
- Focus on species of
- GeoNetwork SDI catalog
- Projections also from Down-under



Global Record of Stocks and Fisheries

<https://i-marine.d4science.org/web/grsf/map-viewer>

- Even more external data; now with RAM Legacy database and Fishsource of SFP
- HUGE data harmonization effort
- Unique Identifiers for traceability
- Uses Blue cloud for semantic KB



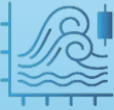
Two Blue Cloud Demonstrators



Zoo & Phytoplankton
EOV products



Plankton
Genomics



Marine Environmental
Indicators



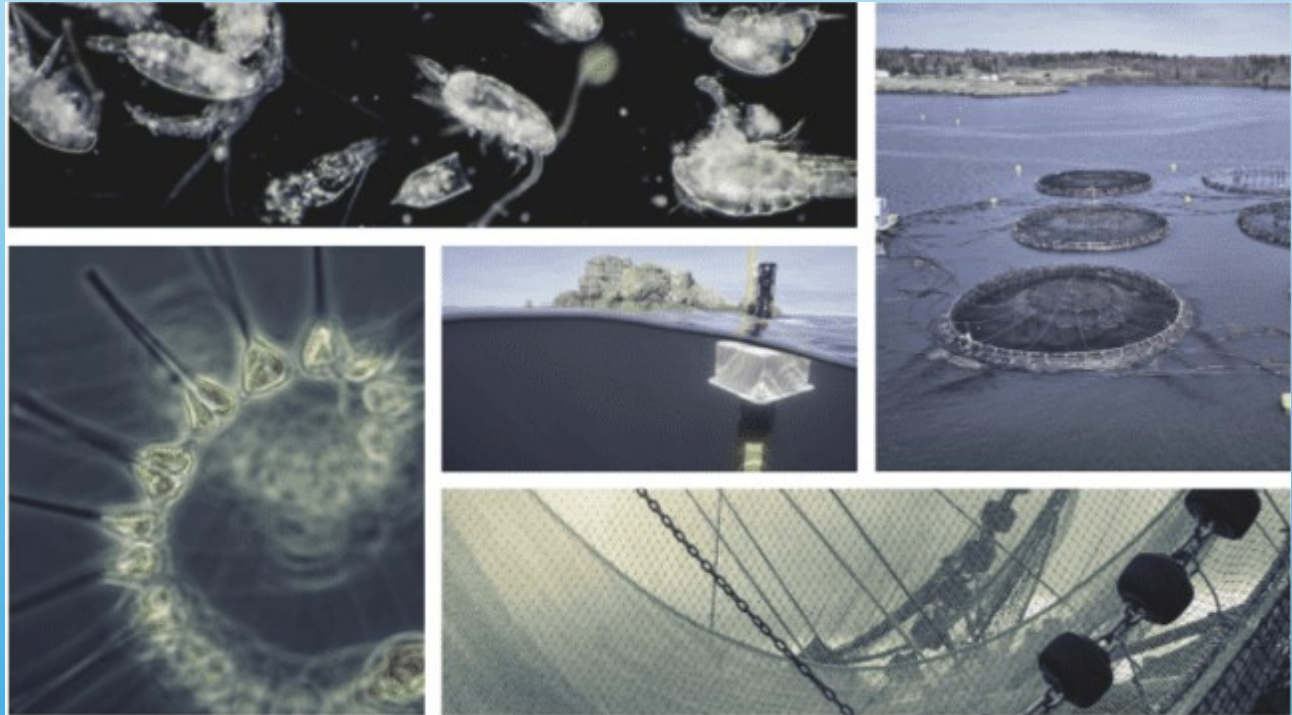
Fish a matter
of scales



Aquaculture
Monitor

Blue Cloud Demonstrators (re)use existing FAO services, and add new ones.
They put the I and R in FAIR; Interoperability and Reproducibility

They focus on **marine ecosystems research, conservation, forecasting & innovation in the Blue Economy**

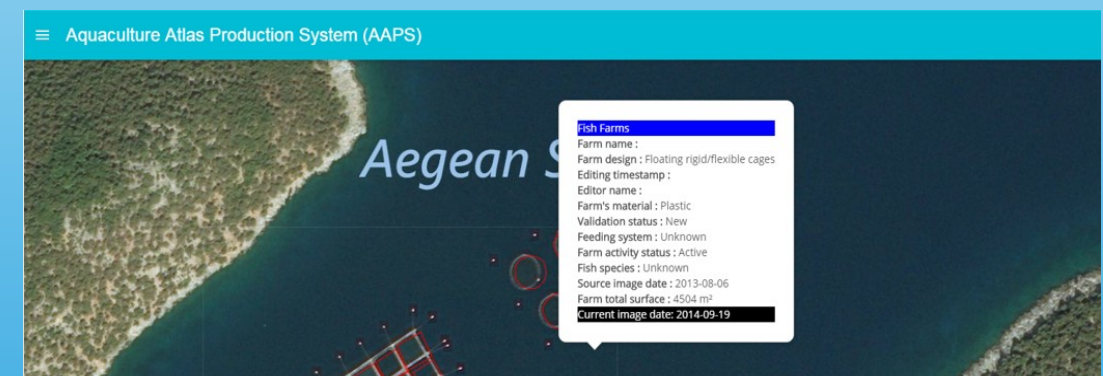
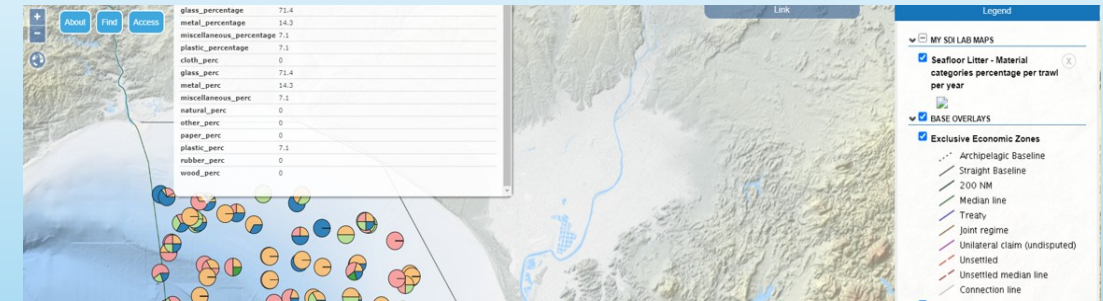


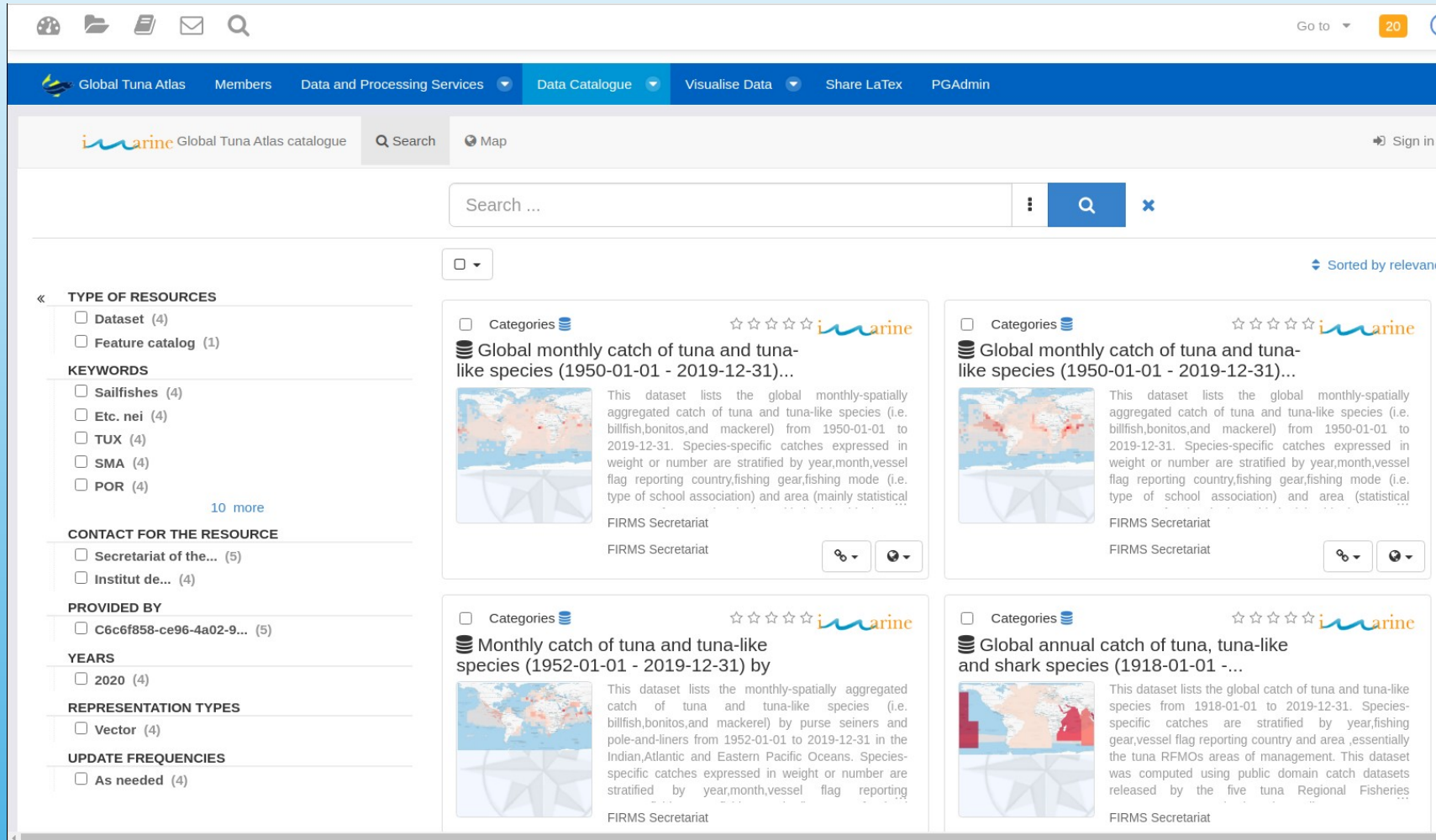
<https://www.blue-cloud.org/demonstrators>

Blue Cloud VRE's give Flexibility

Blue Cloud enables VRE flexibility

- With Data content from the federated platforms
 - E.g. SeaDataNet
 - E.g. other demonstrators; EOVS
- With Data processing services from e.g. WEkEO
 - E.g. Weather events or forecasts
 - E.g. Satellite detection of Floa-things
- With User uploaded content
 - Use bespoke services to manage content
 - E.g. enrich detected features
- We can create rich atlases for regional analysis
 - WECAFC test-case



The screenshot shows the web application interface for the Global Tuna Atlas GeoNetwork. The top navigation bar includes links for Global Tuna Atlas, Members, Data and Processing Services, Data Catalogue, Visualise Data, Share LaTeX, and PGAdmin. Below this is a search bar and a map icon. The main content area displays a list of datasets, each with a thumbnail map, a title, a description, and a 'FIRMS Secretariat' link. The left sidebar contains filters for 'TYPE OF RESOURCES', 'KEYWORDS', 'CONTACT FOR THE RESOURCE', 'PROVIDED BY', 'YEARS', 'REPRESENTATION TYPES', and 'UPDATE FREQUENCIES'.

- ISO/OGC compliant global tuna catch (1950-present)
- Built with open source R tools
 - geoflow
 - OpenFairViewer
- Core services:
 - Data catalogue
 - MapViewer

Stock Monitoring Tool

Home
CMSY
Length-based methods
 >> Information
 >> TropFishR
 >> Sample Datasets
Fish Methods
Supporting Tools

Length-based stock assessment with TropFishR

By TropFishR version 1.6.2

More information about **Data** **Methods** **Results**

Data Upload

Choose Input CSV File

Browse... elefan_if_SMA_2005_2018_nozeros_monthly_50lim.csv

Upload complete

Choose CSV date format

Automatic guess

Assessment Settings

1. Data 2. ELEFAN 3. Stock status

Select years for analysis

2009 2010 2011 2012 2013 2014 2015 2016
2017 2018

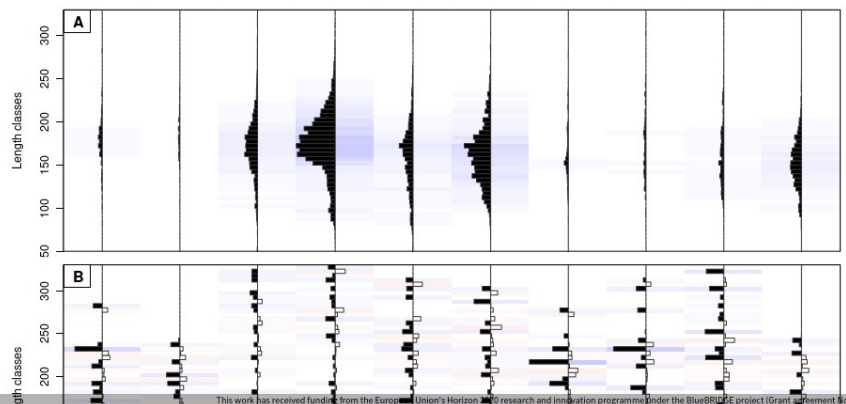
Aggregate data by

year

Bin Size

5

Moving Average (MA)

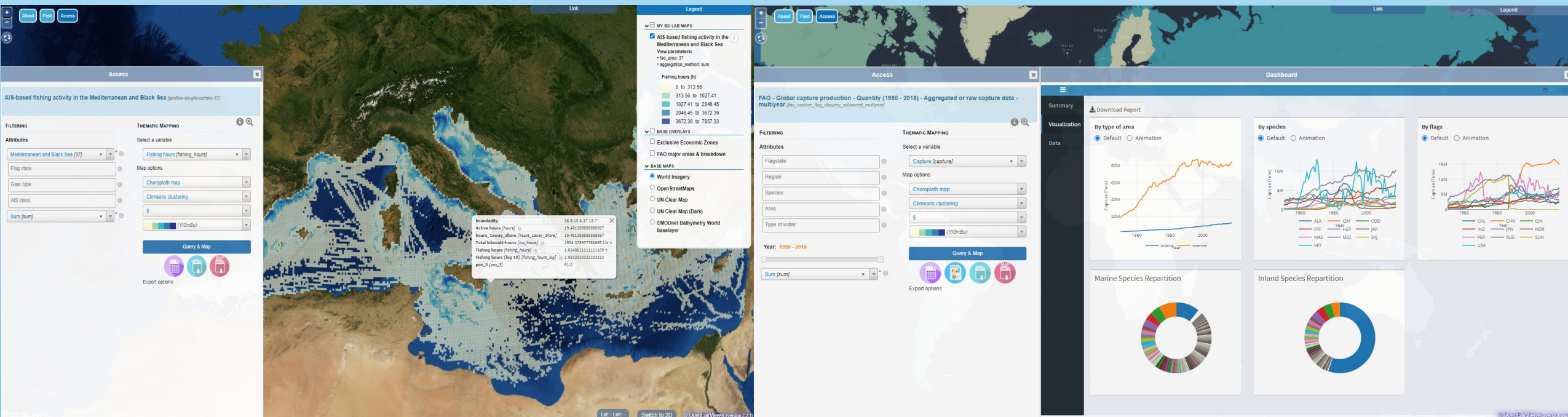


This work has received funding from the European Union's Horizon 2020 research and innovation programme under the BlueBio4 project (Grant Agreement No 675680) and in-kind from NOAA

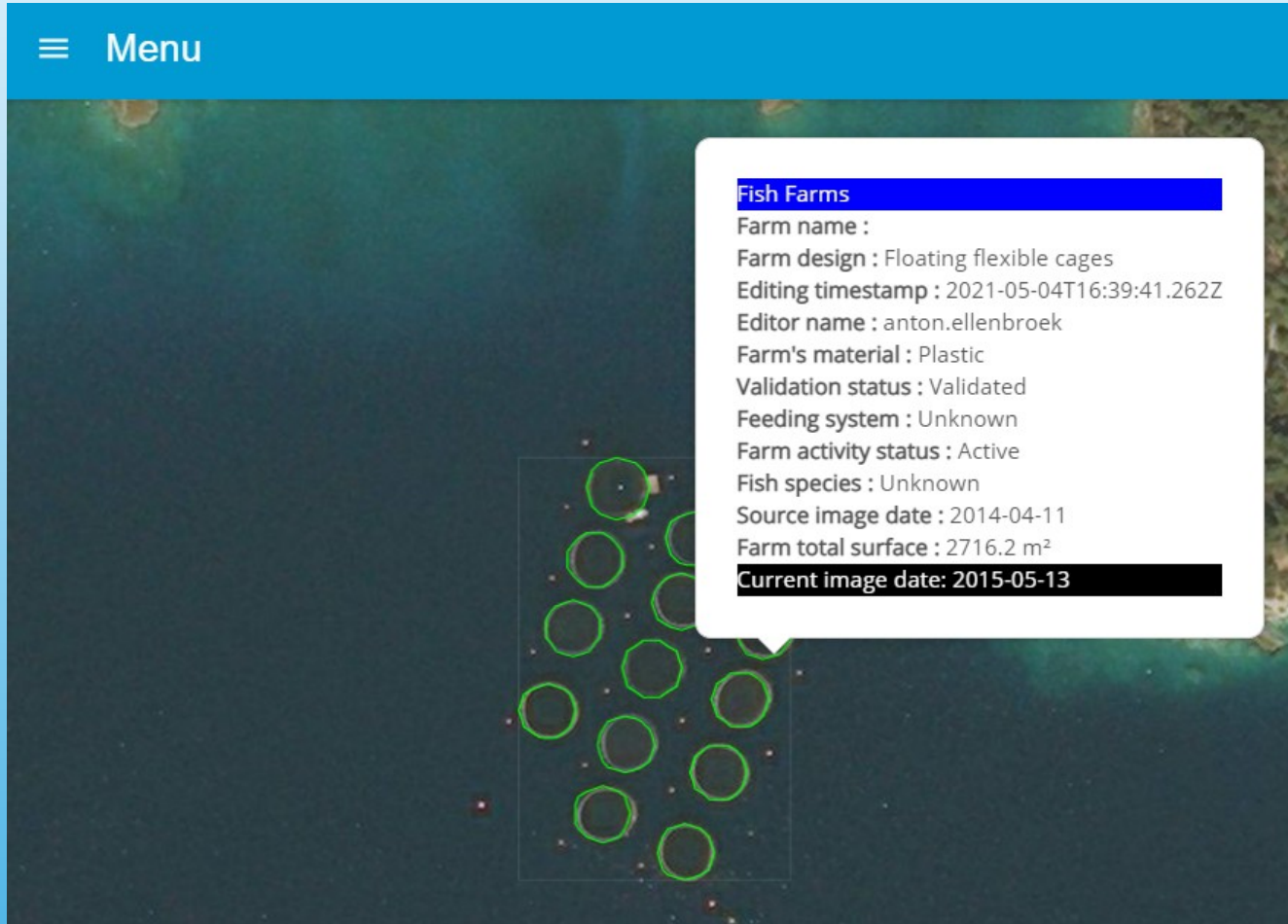
- Deploy Applications
 - e.g. Docker for Cloud deployment of software
 - e.g., Stock Monitoring Tool
 - R shiny application
 - data-limited methods
 - e-learning and hands-on training
- A very powerful training environment

The Fisheries Atlas

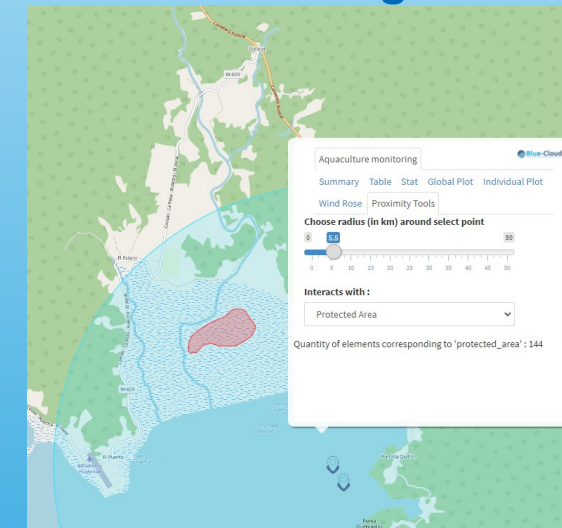
- There is more than fish in the Ocean
- Integration of more datasets (MPA's, ecology, environment, fleet dynamics, ...)
- Analytical services in the map viewer (e.g. Shiny apps)



Copernicus for Cage detection



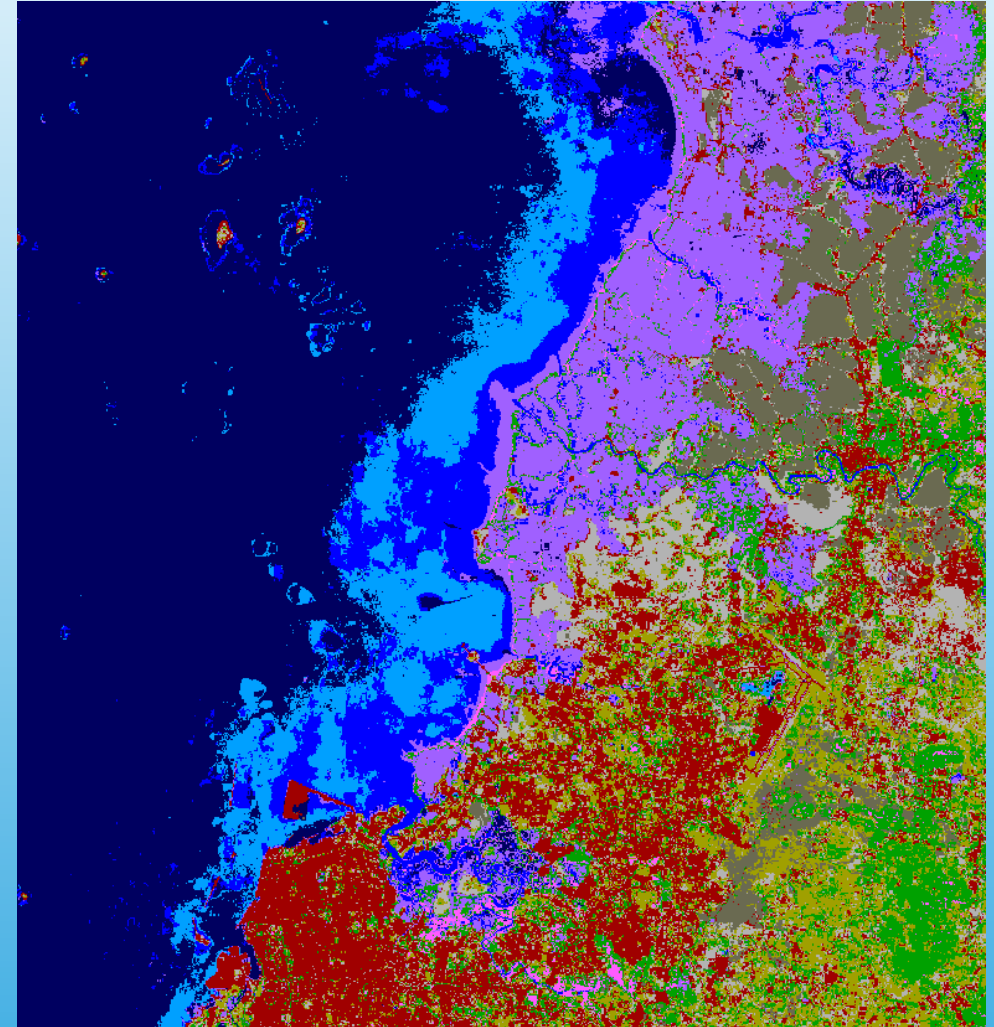
- Sentinel 1 Radar CLS product
 - e.g. detection of Cages (or vessels)
 - Tests on Chile salmon and Med bream/bass cages
 - Integrated with Blue Cloud viewer
 - S1 locations detection
 - FAO / Blue Cloud attribute management and clustering
- In test



Copernicus for land-type classification

Sentinel 2 Radar CLS product

- e.g. detection of Ponds
 - AI based tool to classify land-types
 - Tests on coastal areas (where others get stuck)
 - Integrated with Blue Cloud viewer
 - S2 classification output of CLS ingested
 - FAO / Blue Cloud attribute management and clustering
- In development





Blue-Cloud

Thank you! Questions?

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