

 **Welcome!**

Hands-On with the EDITO Data API

Learn to explore, search, and use marine data from the EDITO Data Lake

 Presented by Samuel Fooks (VLIZ)

For all the PDFs and code, check out the workshop [GitHub repository](#)



What is EDITO?

EDITO stands for the **European Digital Twin of the Ocean**.

 It is a European infrastructure to:

- Integrate marine data, models, and services
- Support marine policy (e.g. the Green Deal)
- Help connect EU/national initiatives and citizen science

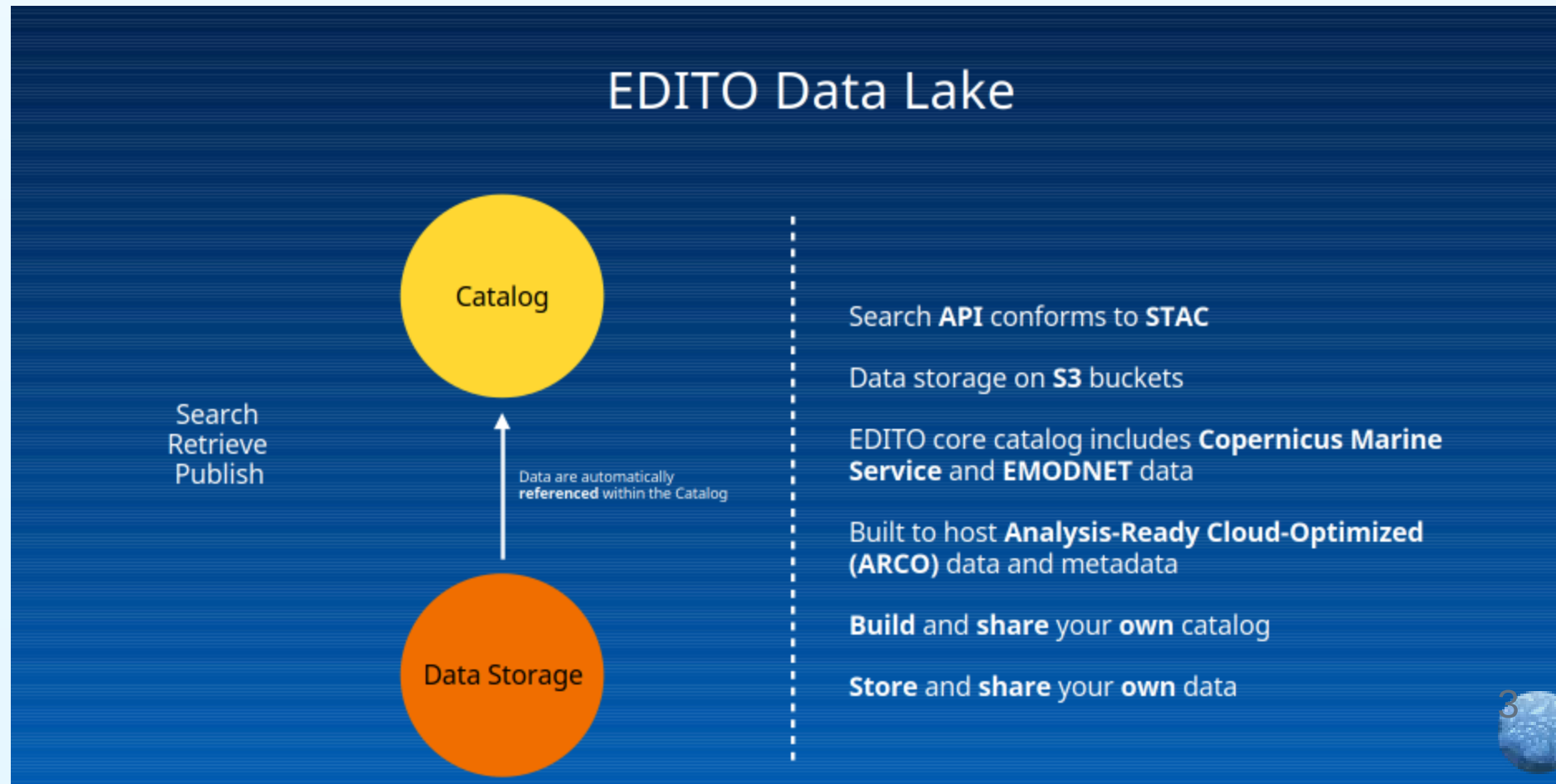
 Offers:

- Open API access to curated datasets
- Analysis-ready formats (Zarr, Parquet, COG)
- Tools to publish, process, and visualize ocean data







Data in EDITO

The data available in the EU DTO consists of a **STAC (SpatioTemporal Asset Catalog)** as well Data storage on S3 buckets



EDITO STAC

EDITO offers a standardized **STAC (SpatioTemporal Asset Catalog)** built on **CMEMS** and **EMODnet** data, designed to integrate diverse marine and environmental datasets.

-  Based on **OGC STAC API** for easy discovery and access
-  Integrates data from multiple domains (ocean, climate, biodiversity)
-  Search by time, space, type — with direct links to S3-hosted assets
-  Supports both human users and automated workflows

A gateway to an **interoperable ocean of FAIR data**



What is STAC?

STAC = SpatioTemporal Asset Catalog

A community standard for:

- Describing Earth-observation data
- Providing metadata for geospatial assets

Used across satellites, models, and in-situ data.

 Learn more: stacspec.org



STAC Structure

- ◆ **Catalogs** – High-level groupings (e.g., "All CMEMS data")
- ◆ **Collections** – Thematic datasets (e.g., temperature, sea level)
- ◆ **Items** – Individual assets with time+space (e.g., file for 2024-01-01)
- ◆ **Assets** – Actual data files: GeoTIFF, Zarr, Parquet...

Each has consistent metadata (bbox, datetime, etc.)



Use the EDITO STAC Viewer

viewer.dive.edito.eu


We can follow the STAC structure to the EUROBIS database exported in parquet


Catalog -> Catalog -> Collection -> Item

EMODnet -> Biodiversity -> Occurrence data -> Occurrence data eurobis database
observations



DEMO Using STAC Viewer

 EDITO

 Viewer

32caca2b-12fe-5ddb-84c0-a2617f972c3c

EDITO Data Catalog

- Catalogs
 - EMODnet
 - biodiversity
 - Occurrence data (EMODnet convention)
 - All items
 - Occurrence data eurobis database observations

1 results (displays first 1)

Close

Occurrence data eurobis database observations

[Center on footprint](#) [Product page](#)

Assets

XML

XML

CSW

Web Map Service (WMS)

✓

i

Parquet

Parquet (Open in Data Explorer)

Metadata

COMMON

Collection




emodnet-occurrence_data

Time of Data begins

January 1st 1753 - 00:00:00

Time of Data ends

May 19th 2035 - 00:00:00



Search EDITO STAC via the API

Base URL for STAC:

```
https://api.dive.edito.eu/data/
```

 Docs: [Interact with Data API](#)



What is ARCO Data?

ARCO = Analysis Ready Cloud Optimized

EDITO adopts modern cloud-friendly formats:

- High performance
- Scalable access
- Efficient for machine learning, large analytics

Let's explore each format!



Zarr Format

Zarr is used for chunked N-dimensional arrays (like NetCDF but cloud-native)

- ✓ Ideal for model outputs, time series, climate reanalyses
- ✓ Works well with `xarray`, `kerchunk`, `zarr-python`

 zarr.readthedocs.io

```
import zarr
import xarray as xr

xr.open_zarr("https://s3...zarr/", consolidated=True)
```



Parquet and GeoParquet

Parquet = columnar tabular format, very efficient

GeoParquet = Parquet + geospatial metadata

- ✓ Good for point observations, events, tracks, etc.
- ✓ Efficient for large queries and spatial joins

 parquet.apache.org

 geoparquet.org



Access Parquet/GeoParquet via Arrow (Python)

```
import pyarrow.dataset as ds
import s3fs

fs = s3fs.S3FileSystem(anon=True)
dataset = ds.dataset("s3://...your-parquet-folder...",
                    filesystem=fs, format="parquet")

df = dataset.to_table().to_pandas()
print(df.head())
```



Lets Explore the EDITO STAC, find an ARCO dataset from Biodiversity

viewer.dive.edito.eu



Reading parquet

Lets go read that parquet

<https://s3.waw3->

[1.cloudferro.com/emodnet/biology/eurobis_occurrence_data/eurobis_occurrences_geoparquet_2024-10-01.parquet](https://s3.waw3-1.cloudferro.com/emodnet/biology/eurobis_occurrence_data/eurobis_occurrences_geoparquet_2024-10-01.parquet)

Using a pre configured service on EDITO [explore_data/view_parquet](#)



🔍 Exploring STAC via the API (Python)

```
import pystac_client

url = "https://api.dive.edito.eu/data/collections"
editocollections = pystac_client.Client.open(url)
collections = list(editocollections.get_collections())

print("Found collections:", len(collections))
for col in collections[:5]:
    print(col.id, ":", col.title)
    items = col.get_items()
    itemlist = list(items)
    for item in itemlist:
        print(item.properties['title'])
        print(item.assets)
```

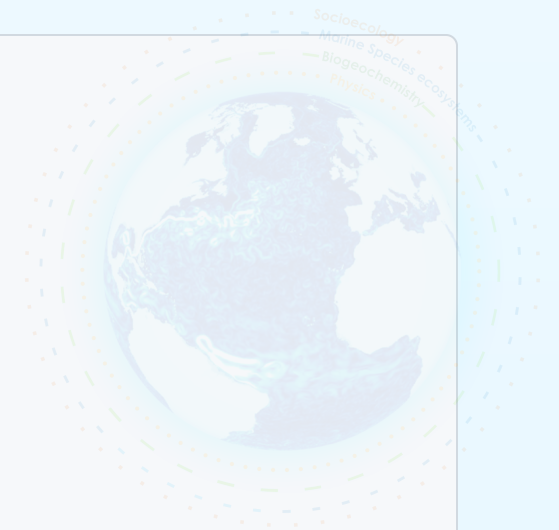


Exploring STAC via the API (R)

```
library(rstac)

stac_endpoint <- "https://api.dive.edito.eu/data/"
collections <- stac(stac_endpoint) %>%
  rstac::collections() %>%
  get_request()

length(collections$collections) # how many
```



👉 R packages like `arrow`, `sf`, `terra` also help with asset processing.

Recap: What You Can Now Do

- ✓ Understand the EDITO API and data stack
- ✓ Find and filter collections/items
- ✓ Read Parquet or Zarr data with Python or R
- 🧭 Go explore: my-ocean.dive.edito.eu
viewer.dive.edito.eu
- 💬 Questions?
- ✉ Reach us at: edito-infra-dev@mercator-ocean.eu
- 🔗 Docs: [Interact with EDITO Data](#)
- 🌊 Happy exploring!

