🌊 Welcome!

Hands-On with the EDITO Data API

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

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<button class="toc-toggle">📋</button>

📋 Slide Overview

🌍 What is EDITO?

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

🧭 It is a European infrastructure to:

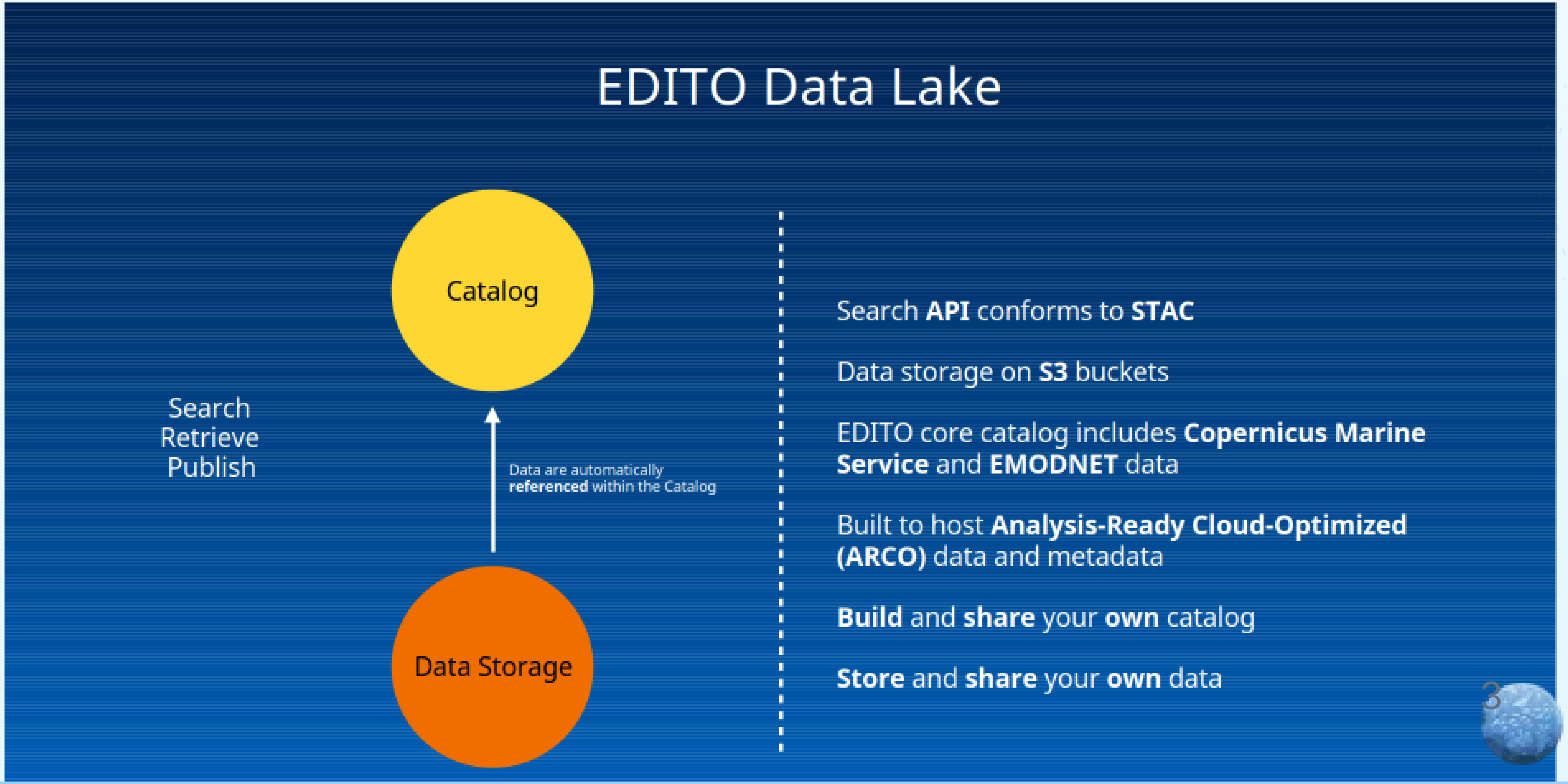
- Integrate marine data, models, and services
- Support marine policy (e.g. the Green Deal)
- Help connect EU/national initiatives and citizen science

🌐 Offers:

- Open API access to curated datasets
- Analysis-ready formats (Zarr, Parquet, COG)

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 Data Lake

Search **API** conforms to **STAC**

Data storage on **S3** buckets

EDITO core catalog includes **Copernicus Marine Service** and **EMODNET** data

Built to host **Analysis-Ready Cloud-Optimized (ARCO)** data and metadata

Build and **share** your **own** catalog

Store and **share** your **own** data

🗂️ 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

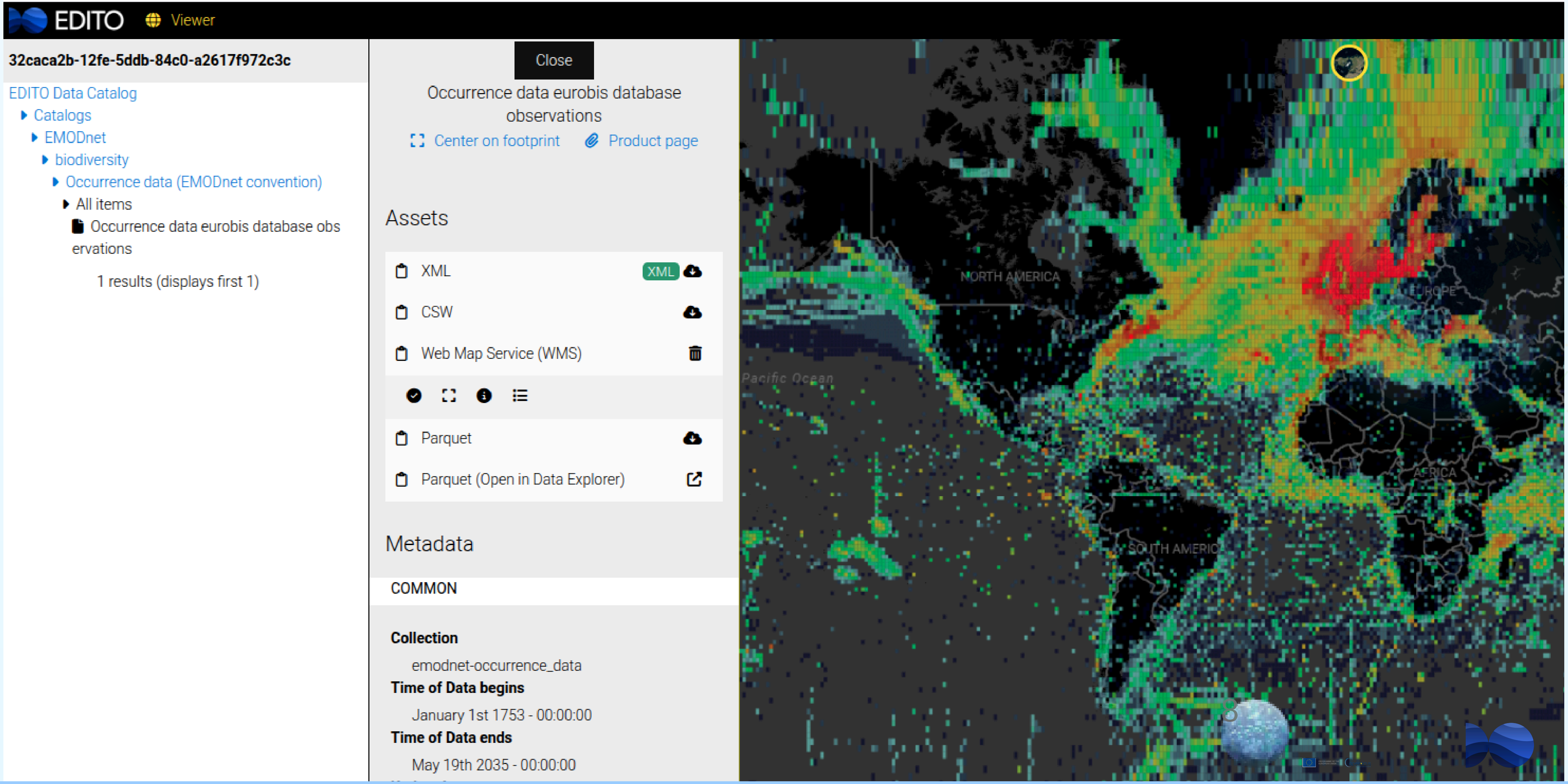
viewer.dive.edito.eu

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
- CSV
- Web Map Service (WMS)
- 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)

```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

Using a pre configured service on EDITO explore_data/view_parquet

🔍Exploring STAC via the API (Python)

```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!