

# 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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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:

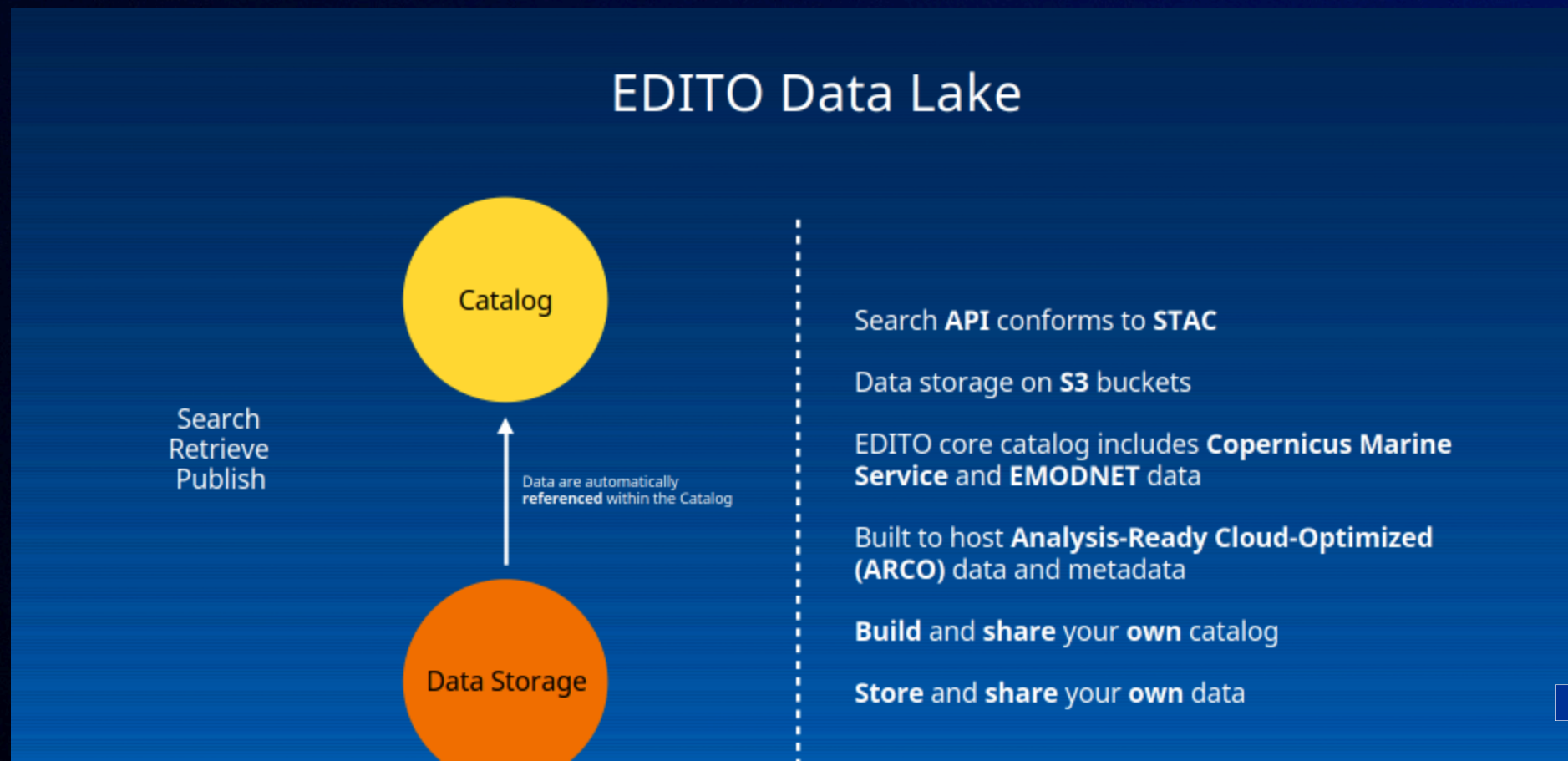
- Integrate marine data, models, and services
- Support marine policy (e.g. the Green Deal)
- Help connect EU/national initiatives and citizen science

 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 Data Storage

EDITO Data Lake uses modern cloud storage solutions to host public datasets. These datasets are stored in:





- **S3-compatible object storage**
- **Access via URL, anonymous or secure**
- High performance, cloud-native data formats

 Explore: [38 million occurrence records](#)



## 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](https://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](https://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  
- CSW 
- Web Map Service (WMS) 
-    
- Parquet 
- Parquet (Open in Data Explorer) 

Metadata

COMMON

Collection

- emodnet-occurrence\_data

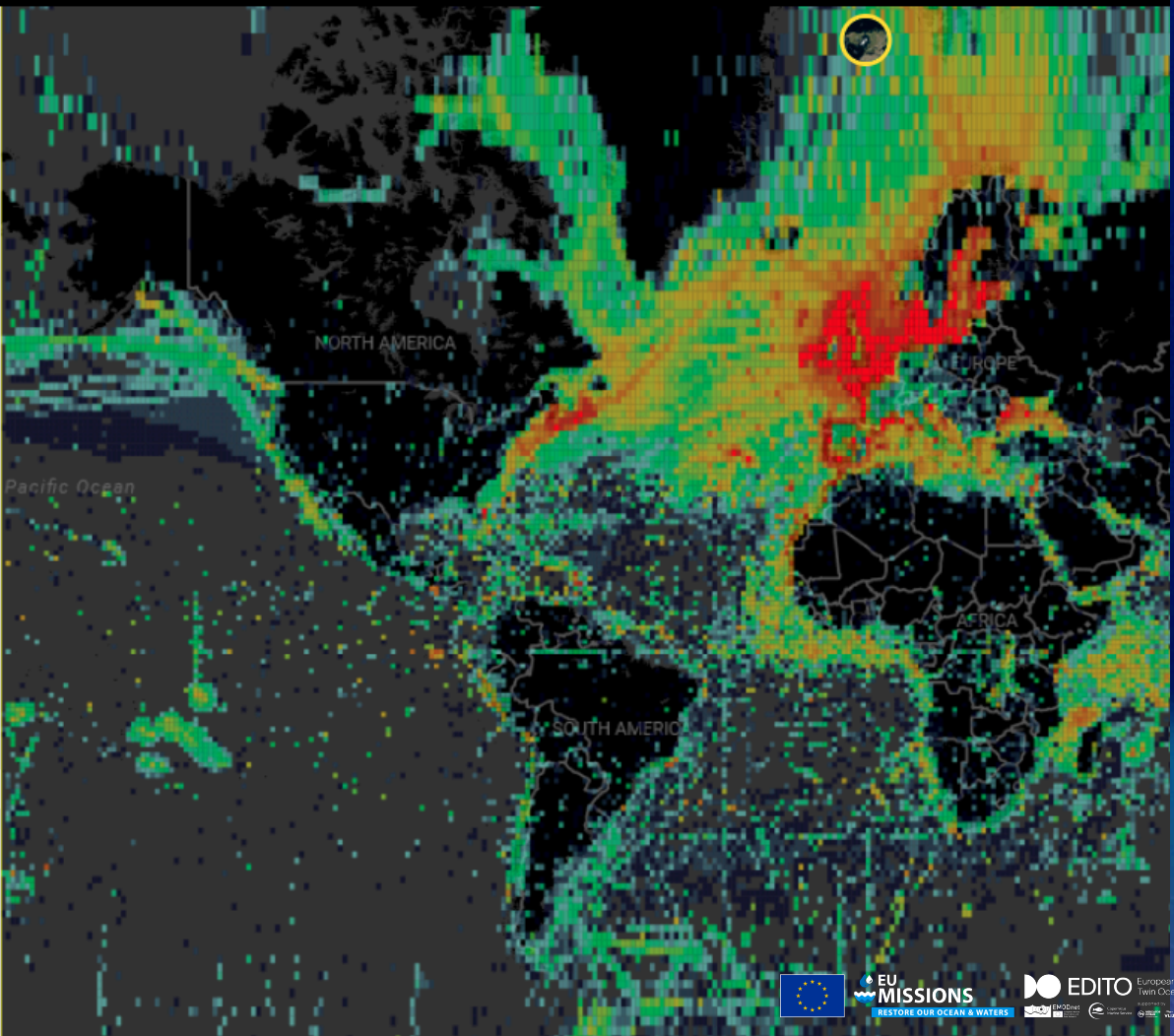
Time of Data begins





- January 1st 1753 - 00:00:00

Time of Data ends

- May 19th 2035 - 00:00:00

Updated



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# 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](https://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](https://parquet.apache.org)

 [geoparquet.org](https://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](https://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](https://my-ocean.dive.edito.eu)  
[viewer.dive.edito.eu](https://viewer.dive.edito.eu)

 Questions?

 Reach us at: [edito-infra-dev@mercator-ocean.eu](mailto:edito-infra-dev@mercator-ocean.eu)

 Docs: [Interact with EDITO Data](#)

 Happy exploring!