EMSO ERIC

EU seafloor and water-column observatories

DOORS Advancing Climate Change Response in the Black Sea
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EMSO ERIC – Introduction

Distributed European RI

Network of **seafloor** and **water-column observatories**

8 Member States, **14** RF, **27** Eu Institutions

~ 130 variables

Goal: offering **FAIR** data & services to scienti community

EMSO Data Infrastructure

Initial Approach: Centralized data infrastructure complemented by a harmonization system.

Problem: Heterogeneous data would require significant investment of time and effort from RF to achieve harmonization.

Actual Approach: Federated data infrastructure utilizing **ERDDAP** for enhanced data distribution and retrieval.

EMSO ERIC Data Infrastructure: ERDDAP

ERDDAP: EMSO's data backbone

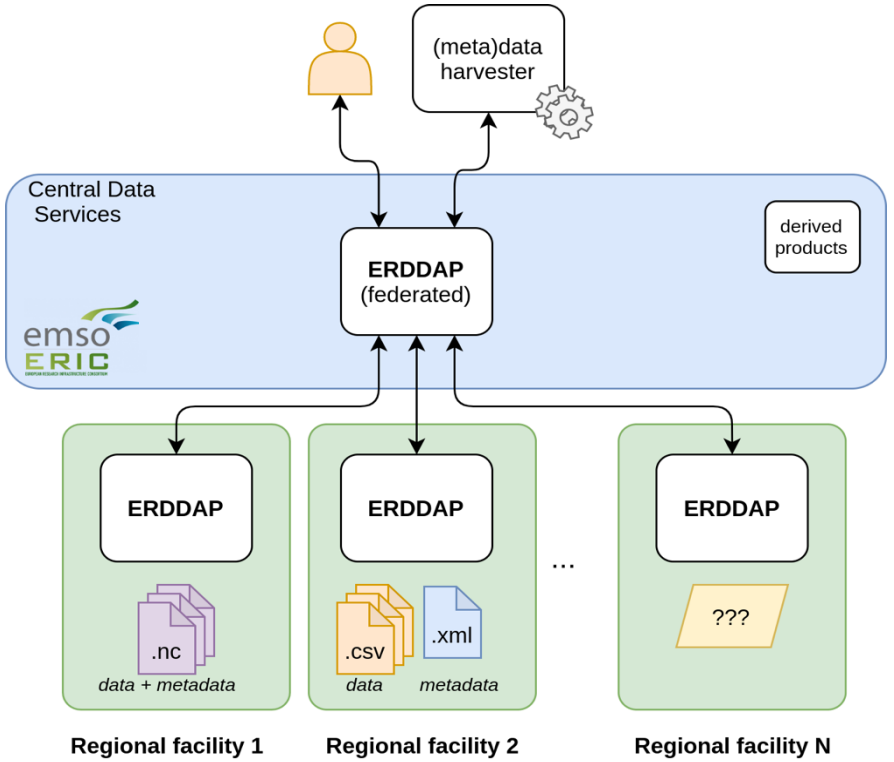
Open-Source Software developed by **NOAA**

ERDDAP servers deployed at regional facilities

Central ERDDAP links regional facilities

Data Managed at RF level (collected, stored)

Data needs to be fully **harmonized** at every RF



EMSO Metadata Standard

Custom EMSO Metadata Specification Document

Based on the global OceanSITES Data Format but adapted to the needs of EMSO. Version control, human readable, machine-actionable, defines a set of compliance tests

Available in **GitHub** and **Zenodo**

EMSO ERIC Metadata Service

EMSO Metadata Harmonizer tool:

Checks compliance with EMSO specs.

Crawls through ERDDAP's datasets

Tips to improve harmonization

Provides harmonization **score**

Available in GitHub

ERDDAP test report

variable	attribute	required	passed	message	value
global	date_created	True	False	not found	
global	Conventions	False	True		COARDS, CF-1.6, ACDD-1.3
global	institution_edmo_code	True	True		2150
global	geospatial_lat_min	True	True		41.18212
global	geospatial_lat_max	True	True		41.18212
global	geospatial_lon_min	True	True		1.75257
global	geospatial_lon_max	True	True		1.75257
global	geospatial_vertical_min	True	False	not found	
global	geospatial_vertical_max	True	False	not found	
global	time_coverage_start	True	True		2010-03-12T09:30:00Z
global	time_coverage_end	True	True		2023-03-23T09:30:00Z
global	site_code	True	True		OBSEA
global	emso_facility	False	False	not found	
global	source	False	False	not found	
global	title	True	True		CTD data from a SBE16 at OBSEA (30min average)
global	summary	True	True		CTD data collected by a SBE16 deployed at OBSEA, 30min average
global	principal_investigator	True	False	not found	
global	principal_investigator_email	True	False	not found	
global	license	True	True		Creative Commons Attribution 4.0 International (CC-BY-4.0)

```
Required tests passed: 39 of 120
Required tests passed: 1 of 15
   Total tests passed: 40 of 135
Required tests...  32%
Optional tests...  7%
Total tests...     30%
```

Harmonization Status

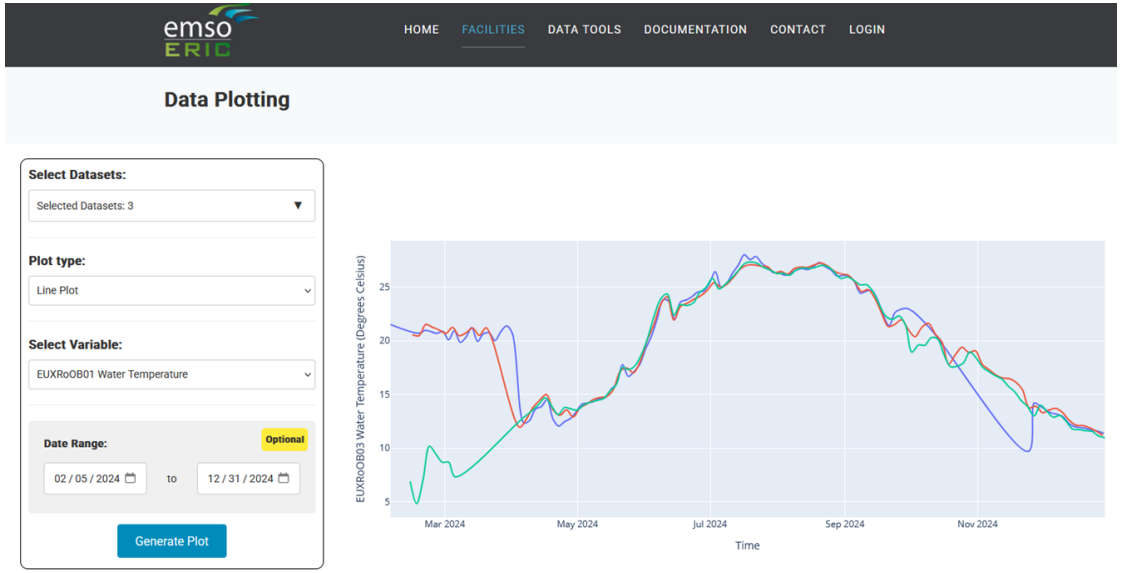
RF harmonization status					
	Regional Facility	Nov 2023	Nov 2024	Jan 2025	Feb 2025
1	SmartBay	25%	78%	81%	75%
2	OBSEA	28%	89%	90%	90%
3	Cretan Sea	71%	87%	87%	87%
4	Ligurian Sea	73%	78%	78%	78%
5	Hellenic Arc	74%	84%	84%	84%
6	Azores	87%	87%	88%	88%
7	Nordic Seas	In progress	99%	99%	98%
8	Western Ionian Sea	96%	100%	100%	100%
9	South Adriatic Sea	100%	89%	89%	89%
10	Western Mediterranean Sea	100%	100%	100%	100%
11	Iberian Margin	96%	In progress	96%	96%
12	**Black Sea**	**In progress**	**In progress**	**94%**	**94%**
13	Canary Islands	In progress	In progress	In progress	In progress
	total average	**75%**	**89%**	**91%**	**90%**

EMSO Black Sea data

Three moorings

Openly available on our central ERDDAP

Physical and biogeochemical data



Why Harmonised FAIR Data in one place, Is Important

Scientists should spend **time on research**

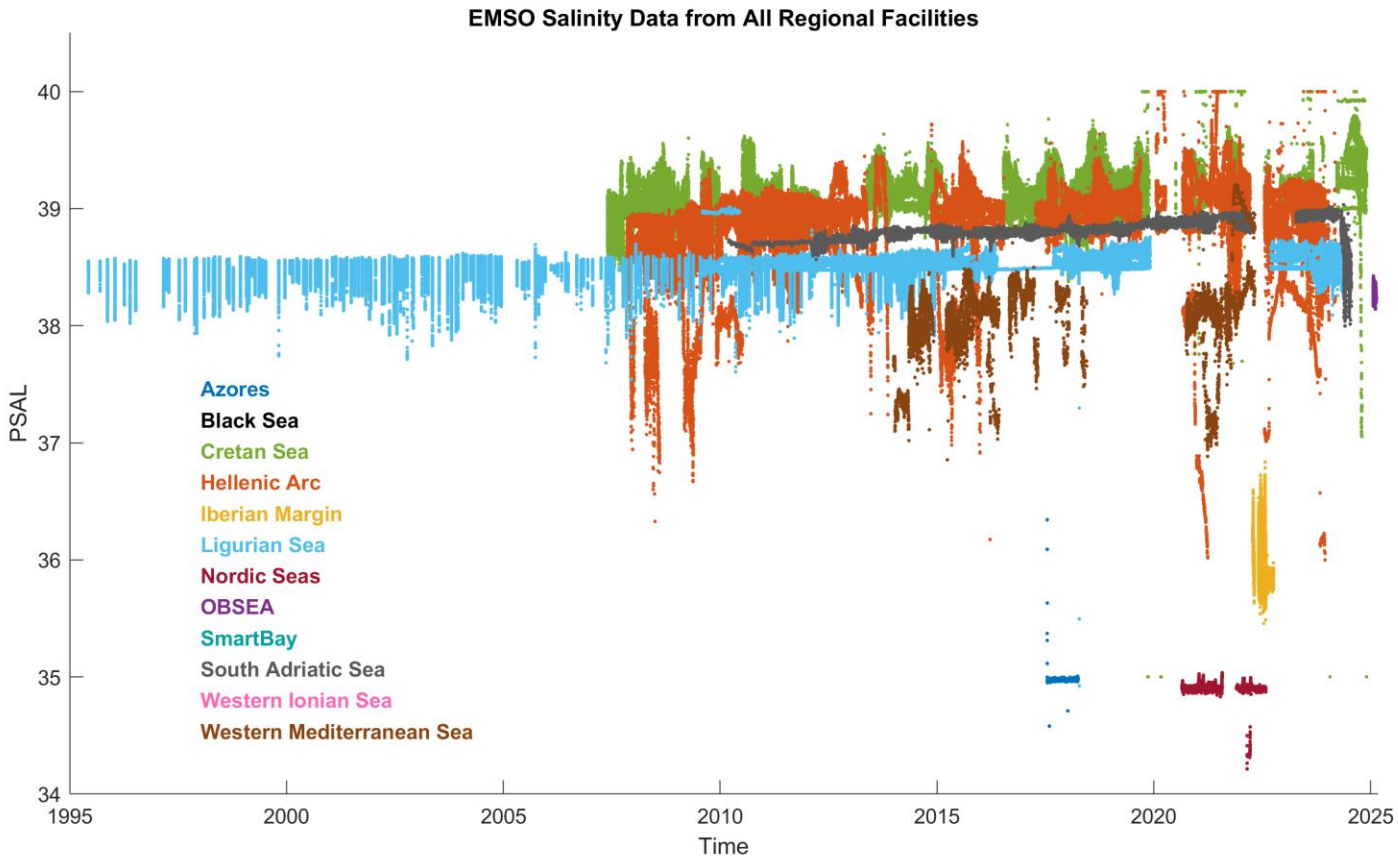
Less time searching, more time **collaborating**

Standardised data improves **reproducibility,** and trust

Accelerates scientific progress by removing technical barriers

emso ERIC
EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM

EMSO Salinity Data from all RF



Thank you for your time and attention!

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