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Vlab 1:

Unlocking the potential for integration of Coastal Ocean Observations along Europe (ICOOE)

IH — João Vitorino, Vânia Lima, Paulo Nunes

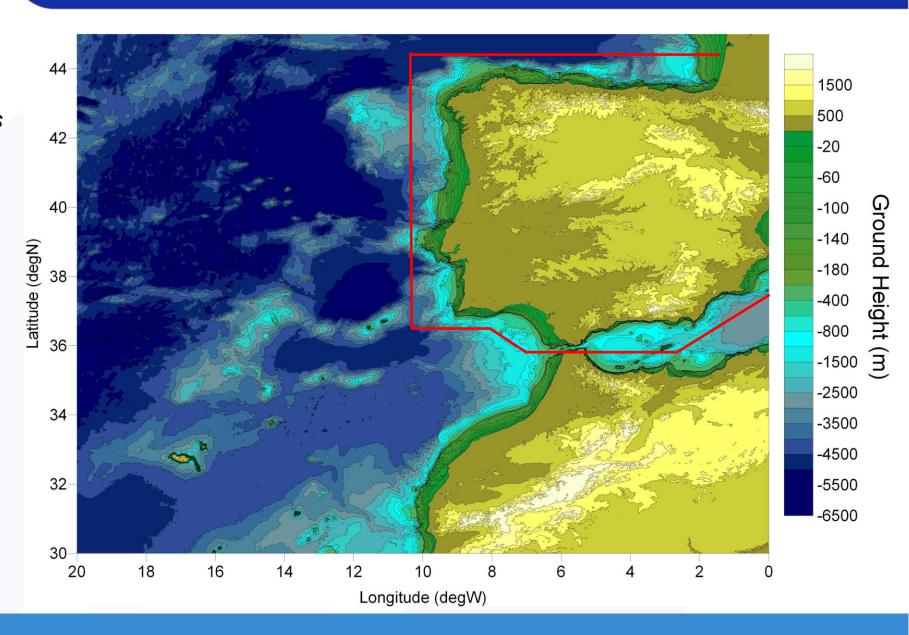
SOCIB - Juan Gabriel Fernández, Miguel Charco, Juan Miguel Villoria

IEEE France - Jay Pearlman



Integration of ocean data and information from different sources is an essential step to build an in-depth knowledge base for applications and to support policy decisions

PARTICULARLY IMPORTANT
IN
COASTAL OCEAN AREAS



A Pan-European effort joining

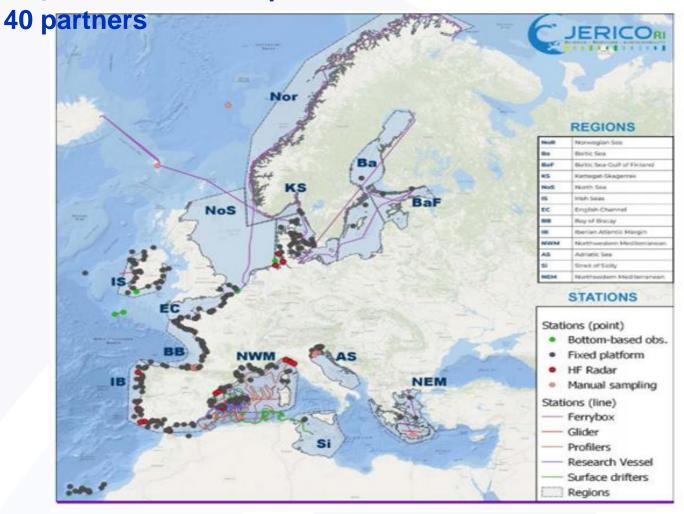
17 European Nations

A multisystem strategy with more than 500 platforms listed

Specific articulations focused on

13 Regional Areas

VLAB#1 will improve the integration and combined analysis of JERICO-RI observations and related information with other available observations and information to get unprecedented insight on key coastal ocean processes



Web: jerico-ri.eu

(f) (g) jericori

JERICO-RI observations

Surface Currents from HF

atitude (deg)



CMEMS

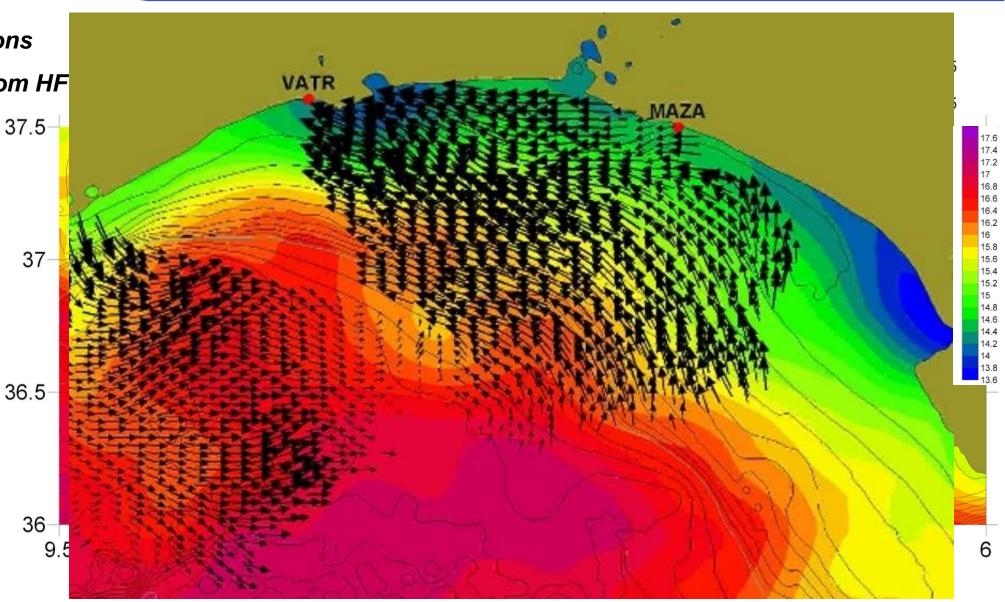
Sea Surface Temp

CCS

Surface Winds

EMODNET, GEBCO

Bathymetry



Surface

Temperature

(degC)

JERICO-RI observations

Glider sections

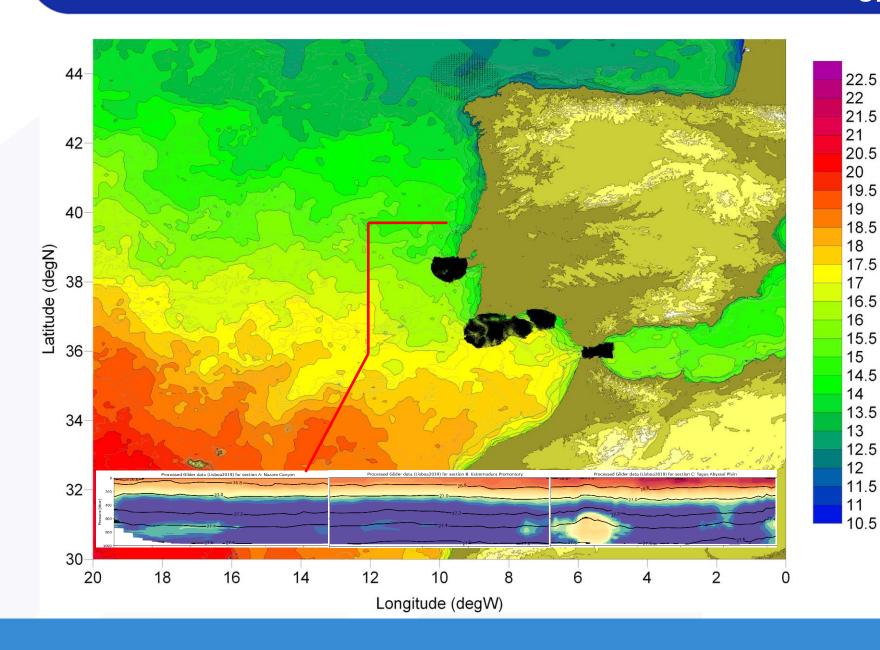


CMEMS

Sea Surface Temperature

CCS

Surface Winds
 EMODNET, GEBCO
 Bathymetry



METHODOLOGY

Three thematic services (TSs) will be implemented and used as demonstrators of integration capacities:

TS1 "transboundary processes and connectivity along the European coastal margins" will explore the potential of data integration, analysis and advanced visualization in the understanding of transboundary processes along the European coastal ocean and mapping their potential impacts (e.g biological connectivity, contaminant spread)

TS2 "Extreme Events" will focus on the impacts of major storms in the European coastal ocean and littoral domain...

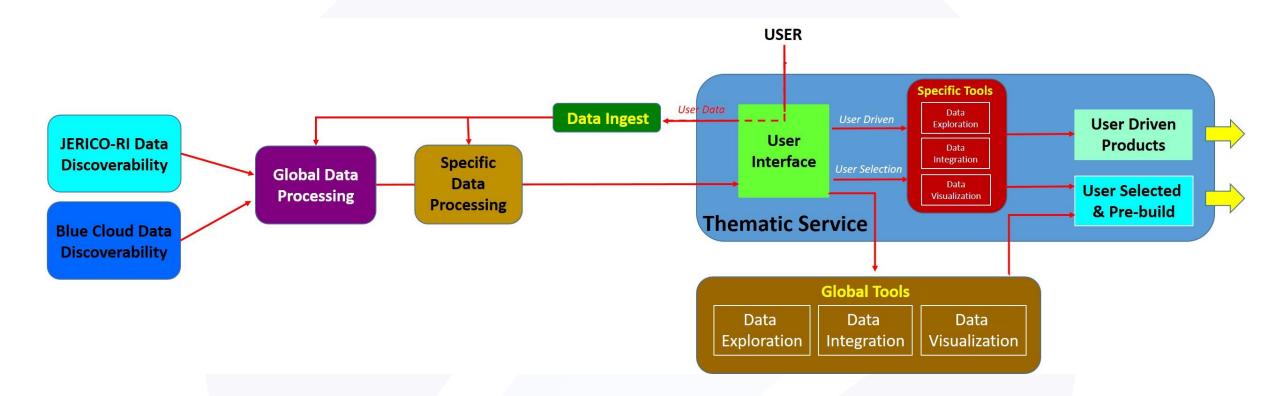
TS3 "Ocean glider" aims to demonstrate the added value chain of repeated glider sections from data acquisition to advanced products and visualisations for improved coastal information, integrating water mass information derived from repeated glider sections

Added-value products consist of advanced data and information products & interactive state-of-the-art visualizations

Providing FAIR tools and services that take advantage of the JERICO-Coastal Ocean Resource Environment (J-CORE) e-infrastructure as well as globally accepted Ocean Best Practices and OGC standards (e.g., WMS and WFS)

J-CORE functionalities (API, web services, client libraries, tools...), will be expanded in the context of WP5 BC2026

GENERAL STRUCTURE ICOOE THEMATIC SERVICE



THEMATIC SERVICES TS#1 & TS#2

JERICO-RI (JERICO-CORE)

JERICO-RI

- > HF Radar Currents
- Current Profile in MP Buoys
- ➤ T in Wave Buoys
- > T,S in MP Buoys
- > T,S Glider
- SSH at coastal tide gagues

BLUE CLOUD RESOURCES

COPERNICUS

- SST fields
- ➤ NEMO 3D T,S, SSH, Current
- ERA5 Surface Meteo Params

SeaDataNet

> Physics, BGC, Biology

EMODnet

Physics, Chemstry, Biology

BATHYMETRY

- > EMODNET, GEBCO
- Other specific for local areas

OPB and AquaDocs

Best practices and documents



USER THEMATIC SERVICE TS#1 **Specific Tools** User Data SPECIFIC DEMO CASES Data LP Filtering **Data Ingest** User Driven **User Driven Exploration** User **Products** Data LP Filtered Interface Integration User Selection **JAN-MAY 2020** Data Data **User Selected** Visualization & Pre-build **VLAB Folder TS#1 Global Tools** Data Data Data Integration Visualization **Exploration** Storm EMMA Non-filtered (28 Feb- 05 Mar 2018) **User Selected** Data **Specific Tools** User Selection & Pre-build **Hurricane LESLIE** Data User Exploration **VLAB Folder** Interface (10 -13 October 2018) Data **User Driven** User Driven Data Ingest Integration **Products** Data **TS#2** Visualization THEMATIC SERVICE TS#2 **USER**

THEMATIC SERVICE TS#3

JERICO-RI

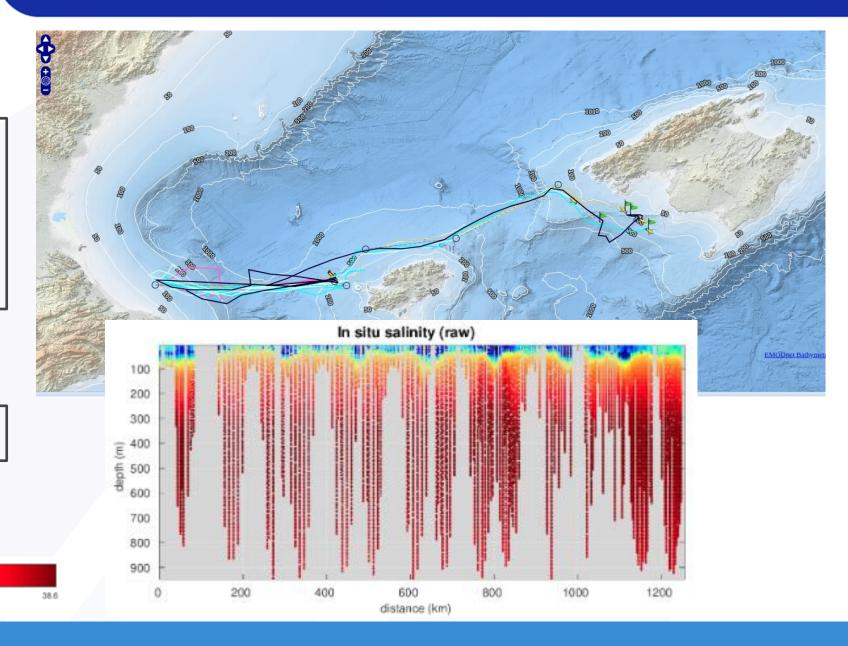
37.6

- Glider profiles from SOCIB endurance observations of the physical and biochemical parameters
- Associated climatology and anomaly

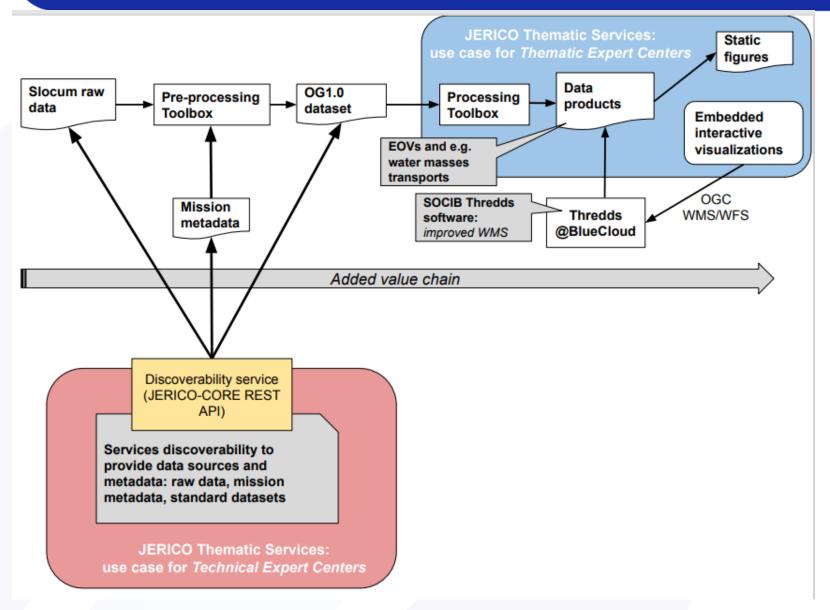
OPB and AquaDocsBest practices and documents

salinity (PSU)

38.2



THEMATIC SERVICE TS#3



Blue Cloud Resources య Sets Data 3

ANALYTICS

DATA PROCESSING

- Glider Toolbox
- Water Mass

DATA AND INFORMATION **EXPLORATION**

- Basic Analysis
- Water Mass Identification
- Variability Structure
- Correlation Analysis

DATA AND INFORMATION INTEGRATION

- Integration Assessment
- **Cross-Correlations**
- Combined Variability Struct.
- "Gap" Filling in Transport
- User Data Ingestionn

ADVANCED INTEGR.

Coastal Ocean Response

R studio, JupyterHub

VISUALIZATION

BASIC VISUALIZATION.

Single and Combined Time Series & Fields

ADVANCED VISUALIZ.

Integrated visualization combining VLAB datasets, user selections and/or user datasets

Data Visualization Tools

Storage & Computing Ext. DAS and API's **Exploitation Platforms**

PRODUCTS

PRE-BUILD

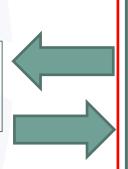
- **Pre-buid Products** (statistics, structure, correlations)
- **Pre-Build Visualizations**

USER SELECTION

- **Basic Analysis**
- Variability Structure
- **Correlation Analysis**

BASED ON USER DATA

- **Basic Analysis**
- Variability Structure
- **Correlation Analysis**





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Dataset/Variable	TS#	Data Infrastructure	Data Access Link to dataset					
IN SITU OBSERVATIONS								
Surface Currents measured by coastal	TS#1	CMEMS(INSITU_GLO_PHY_UV_DISCRETE_MY_013_044)	FTP	https://doi.org/10.17882/86236				
HF radars (JERICO partners)	TS#2	EMODnet Physics						
Current profiles measured by offshore TS#1		Instituto Hidrografico		TBD				
buoys (JERICO partners)		Puertos del Estado						
	TS#1	CMEMS (INSITU_GLO_PHY_SSH_DISCRETE_MY_013_053)		https://doi.org/10.17882/93670				
tide gauges (JERICO partners)	TS#2	EMODnet Physics						
Near Surface Temperature measured by		Instituto Hidrografico		TBD				
offshore buoys (JERICO partners)	TS#2	Puertos del Estado						
Water column T,S measured by	TS#1	PLOCAN	HTTP	http://data.plocan.eu/thredds/catalog/glider/catalog.html				
underwater gliders (JERICO partners)								
SOCIB Glider - Canales EnduranceLine.	TS#3	SOCIB Data Repository	REST API	https://doi.org/10.25704/JD07-SV9				
Water Column Temperature measured	TS#1	Instituto Hidrografico	HTTP	TBD				
by multiparametric buoys (JERICO)	TS#2	Puertos del Estado						
Wave parameters measured by offshore	TS#2	CMEMS (INSITU_GLO_WAV_DISCRETE_MY_013_045)	FTP	https://doi.org/10.17882/70345				
buoys (JERICO-RI partners)		EMODnet Physics						
River outflow from River GaugeStations T		EMODnet Physics	TBD	TBD				
Cook of Cuketonte Cookel Time	TS#1	EMODnot Goology	TBD	TBD				
Seabed Substrate Coastal Type	TS#2	EMODnet Geology	IBD	IDU				
Coastal Migration	TS#2	EMODnet Geology	TBD	TBD				
Monthly Vessel Density Maps (Tankers)	TS#1	EMODnet Human Activities	TBD	TBD				
REMOTE SENSING OBSERVATIONS			21 No. 200 M					
Sea Surface Temperature	TS#1	CMEMS (SST_ATL_SST_L4_NRT_OBSERVATIONS_010_025)	HTTP	https://doi.org/10.48670/moi-00152				
	TS#2							
Sea Surface Height	TS#1 CMEMS (SEALEVEL_EUR_PHY_L4_NRT_OBSERVATIONS_008_06		HTTP	https://doi.org/10.48670/moi-00142				
Surface Geostrophic Current TS		CMEMS (SEALEVEL_EUR_PHY_L4_NRT_OBSERVATIONS_008_060)	HTTP	https://doi.org/10.48670/moi-00142				
Chlorophyll-a concentration	TS#1	CMEMS (OCEANCOLOUR_ATL_BGC_L4_NRT_009_116;	HTTP	https://doi.org/10.48670/moi-00288				
		OCEANCOLOUR_ATL_BGC_L4_MY_009_118)						
				https://doi.org/10.48670/moi-00289				

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Dataset/Variable	TS#	Data Infrastructure	Data Access	Link to dataset			
MODEL RESULTS							
3D analysis of T,S, Current, sea surface	TS#1	CMEMS (IBI_ANALYSISFORECAST_PHY_005_001)	HTTP	https://doi.org/10.48670/moi-00027			
height from NEMO model	TS#2						
3D analysis of wind, air temperature,	TS#1	C3S (ERA5 HOURLY DATA ON SINGLE LEVELS)	HTTP	https://doi.org/10.24381/cds.adbb2d47			
humidity	TS#2						
Habitat Suitability Maps for macro algae	TS#1	EMODnet Biology	DD&AS	TBD			
species							
BATHYMETRY							
DTM for domain selected	TS#1	EMODnet Bathymetry	DD&AS	TBD			
	TS#2						
	TS#3						

THEMATIC SERVICE #1 – ONGOING WORK

System Parameter	HF radars	Multiparametric buoys	Wave buoys	Tide Gauges	Gliders	Remote sensing	Models
Surface Currents							
Sub-surface Currents							
Surface Temperature							
Sub-surface Temperature							
Surface Salinity							
Sub-surface Salinity							
Sea Surface Height							
Wind Stress							

THEMATIC SERVICE #1 – ONGOING WORK

SELECTED CASE FOR ONGOING DEVELOPMENT

System Parameter	HF radars	Multiparametric buoys	Wave buoys	Tide Gauges	Gliders	Remote sensing	Models
Surface Currents							
Sub-surface Currents							
Surface Temperature							
Sub-surface Temperature							
Surface Salinity							
Sub-surface Salinity							
Sea Surface Height							
Wind Stress							



THEMATIC SERVICE #1 – USER SELECTION OF DATA

Select Geographical area of interest

Select Time Period of interest

Start Date: 20020 no 3n colodoth

End Date: 2020r08n3dd28h



THEMATIC SERVICE #1 – USER SELECTION OF DATA

Available Parameters / Datasets for requested area and period

Surface Currents

HF radar TRADE HF radar Gibraltar NEMO model

Sub-Surface Currents

IH MP buoy Faro NEMO model

Surface Temperature

IH MP buoy Faro
IH Wave Faro
Pde MP buoy Cadiz
Pde MP Buy Gilbralta
CMEMS SST
NEMO model

Sub-Surface Temperature

IH MP buoy Faro NEMO model

Surface Salinity

Pde MP buoy Cadiz Pde MP Buy Gilbraltar NEMO model

Sub-Surface Salinity

NEMO model

Sea Surface Height

IH tide Gauge1
IH tide gauge 2
PdE tide gauge 1
PdE tide gauge 2
CMEMS altimetry
NEMO model





THEMATIC SERVICE #1 – USER SELECTION OF DATA

Select Parameters / Datasets of Interest to Analysis

Surface Currents

HF radar TRADE
HF radar Gibraltar

NEMO model

Sub-Surface Currents

IH MP buoy Faro NEMO model

Surface Temperature

IH MP buoy Faro
IH Wave Faro
Pde MP buoy Cadiz
Pde MP Buy Gilbralta

CMEMS SST NEMO model

Sub-Surface Temperature

IH MP buoy Faro NEMO model

Surface Salinity

Pde MP buoy Cadiz Pde MP Buy Gilbraltar NEMO model

Sub-Surface Salinity

NEMO model

Sea Surface Height

IH tide Gauge1
IH tide gauge 2
PdE tide gauge 1
PdE tide gauge 2
CMEMS altimetry
NEMO model

Select Analysis Tools

EXPLORATION OF INDIVIDUAL DATA SETS



CHECK CONSISTENCY OF

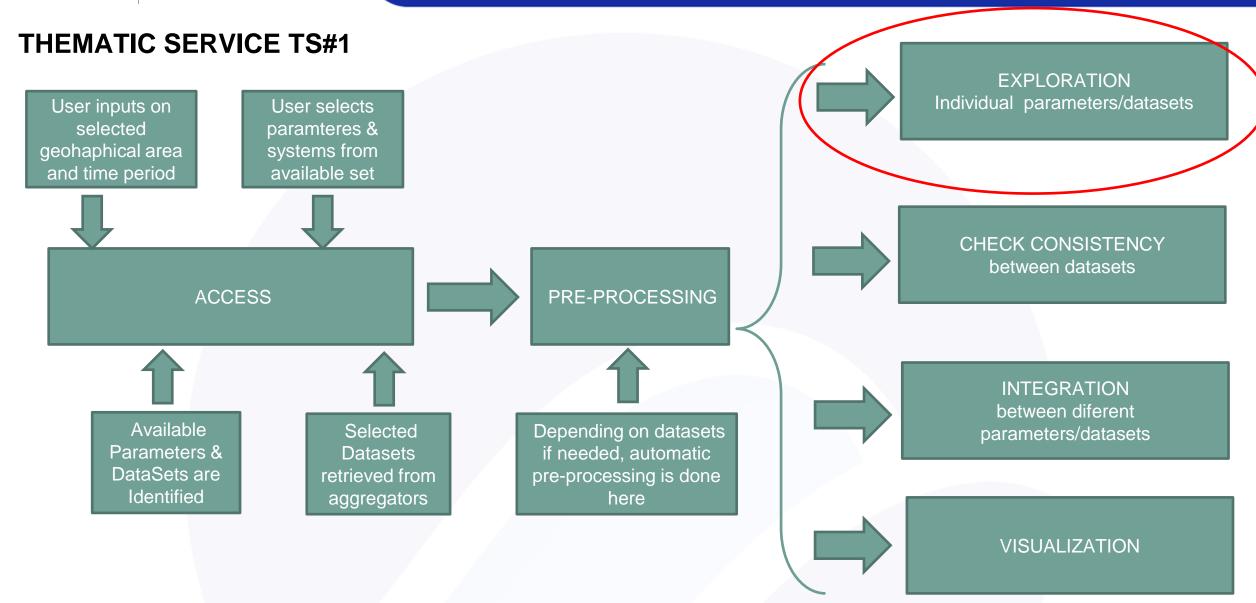
DATA SETS

INTEGRATION OF DATA SETS

ADVANCED INTEGRATION OF DATA SETS

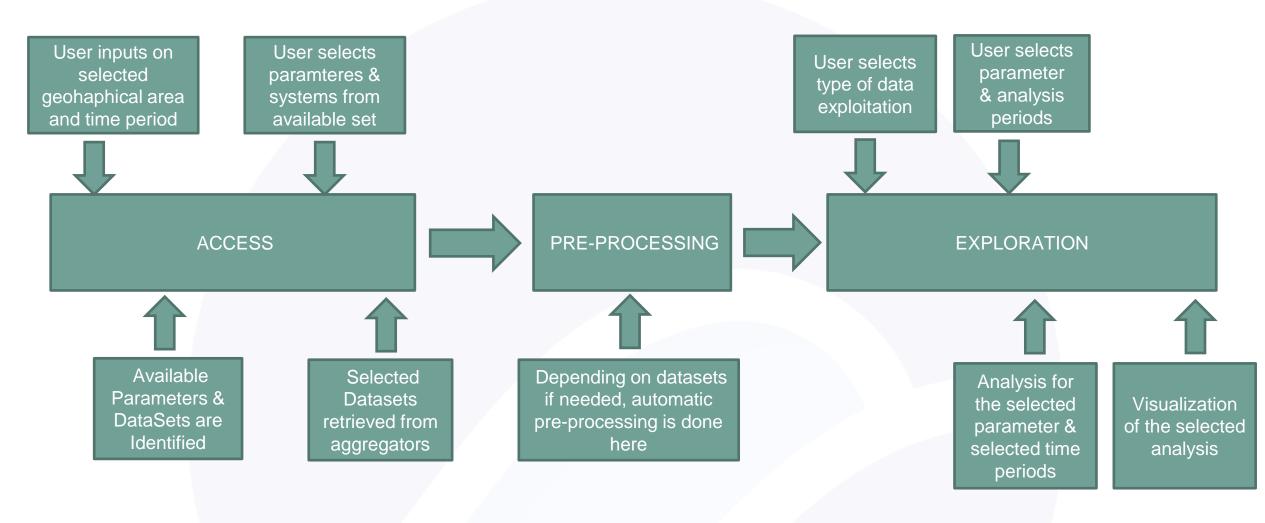
VISUALIZATION OF DATA SETS

THEMATIC SERVICE #1 – MODULES IN DEVELOPMENT



THEMATIC SERVICE #1 – MODULES IN DEVELOPMENT

THEMATIC SERVICE TS#1



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