



Marine Monitoring

In situ data (INSTAC) in the Copernicus Marine Service

2nd EMODnet-Copernicus Marine Thematic Workshop on
Coastal Issues , 22 September 2022



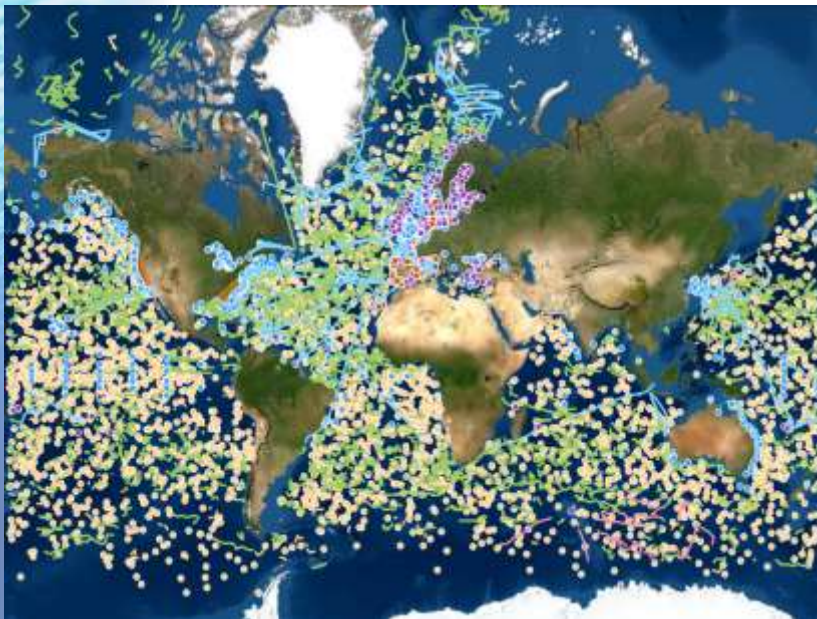
Implemented by






Marine
Monitoring

Coastal data in Copernicus marine INSTAC



In situ platforms the last 30 days
→ from 167 different providers, 7000 active platforms and ~14 GB data

→ To build in situ products available in the Copernicus Marine catalogue 

By design some of in situ platforms are coastal

- HF radars
- Tide gauges

Some others are both interesting in the open sea and at the coast

- Moorings
- Gliders / boundary currents
- Saildrone (new in situ platform)

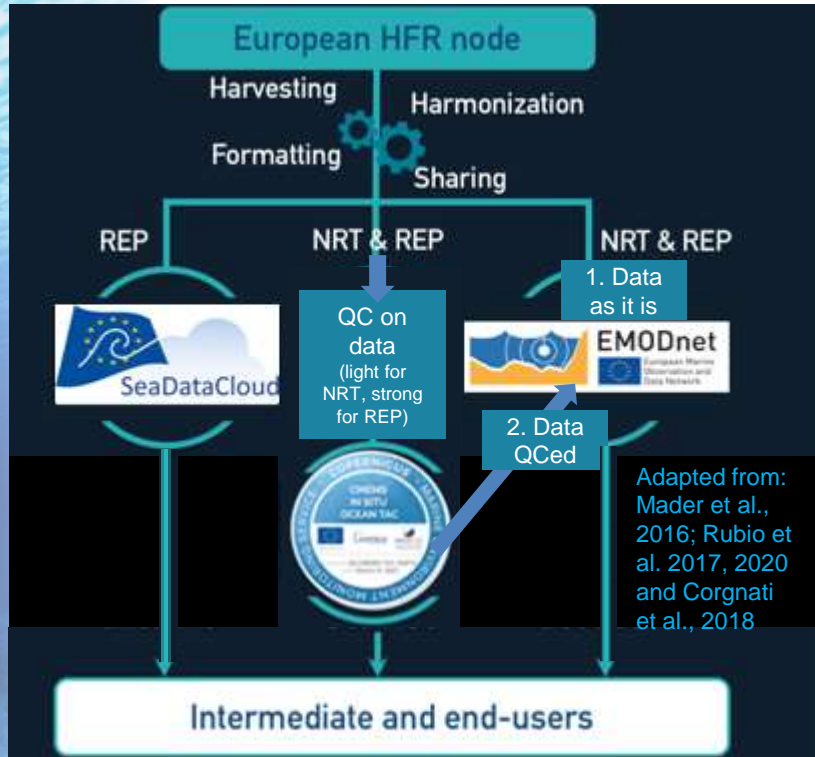
And there are other possible new coastal platforms as

- AIS from ships

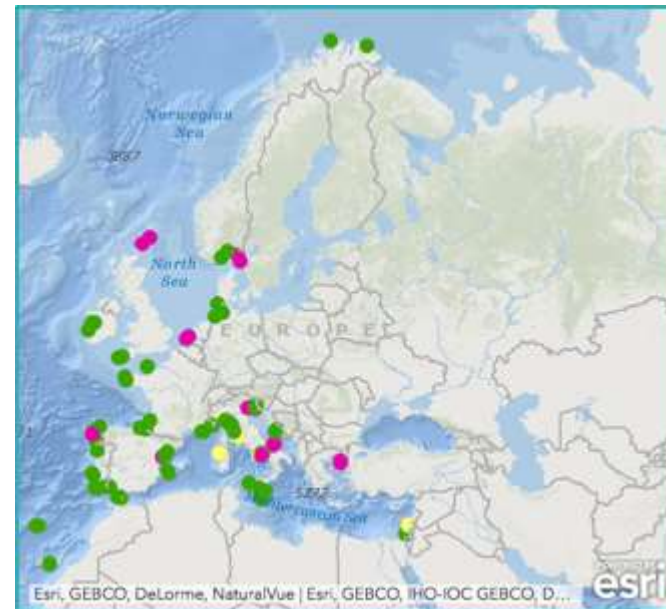


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Focus on coastal high-frequency radars



HFRadars continuously monitors the surface circulation at unprecedented high spatio-temporal resolution (ie. 0-2-6 km, and 15-60 min) over wide coastal areas (up to 200 km offshore, depending on the operational central frequency).



72 operational HF radar sites in Europe

- 2D surface currents maps, waves & wind
- High spatial resolution (0.2-6km)
- High temporal resolution (15-60 min)
- Wide coastal coverage (up to 200 km)
- Complement coastal in-situ & satellite



Focus on coastal tide gauges

New sea level in situ reprocessing (DM) product in Copernicus marine in preparation for the Nov 22 release

Validated:

- QC (tide/surge computation, attenuated signal, buddy-checking completed),
- Visual inspection of total sea levels and surge for all stations

On going for 2023:

- discussion about NetCDF attributes upgrade



Product	INSITU_GLO_PHY_SSH_DISCRETE_MY_013_053	
Datasets	cmems_obs-ins_glo_phy-ssh_my_na_irr	cmems_obs-ins_glo_phy-ssh_my_na_PT1H
	Index_history.txt history	Index_history.txt history
Data type	TG	TG
NetCDF files	One file/platform original sampling	One file/platform hourly reprocessed data
	E.g.: IIO_T5_TG_Forsmark.nc	E.g.: IIO_T5_TG_Forsmark_60minute.nc



Coastal data in Copernicus marine INSTAC

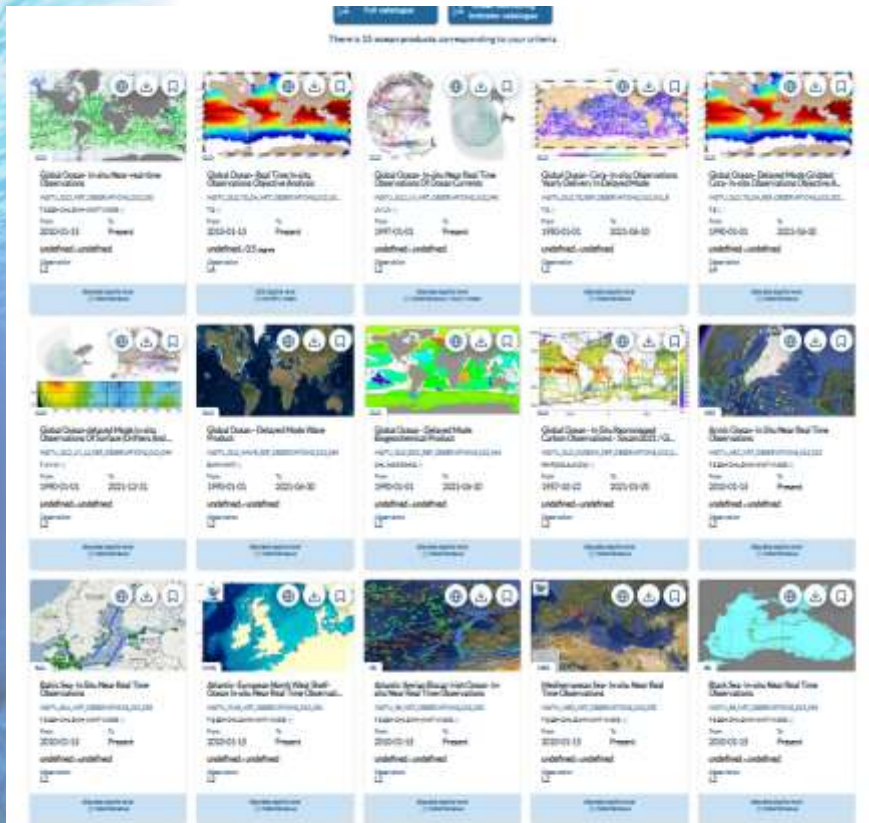
In situ data and products in Copernicus

- Data come from a large span of platforms worldwide, from the open to the coastal ocean
- Variables considered are :
 - Physics: temperature, salinity, currents, waves, sea level
 - Biogeochemistry: chlorophyll, oxygen, nutrients: nitrate, phosphate & silicate
 - Carbonate system: pH, carbon, alkalinity
- Data from 1950 to near real time
- Data & products respect FAIR principles, INSPIRE directives (continuous work)
- Products built by region, by variable groups independently of platforms –available through the Copernicus marine catalogue
- QC (operational) on near real time products (which are hourly updated)
- Delayed mode products with higher level of QC



Coastal data in Copernicus marine INSTAC

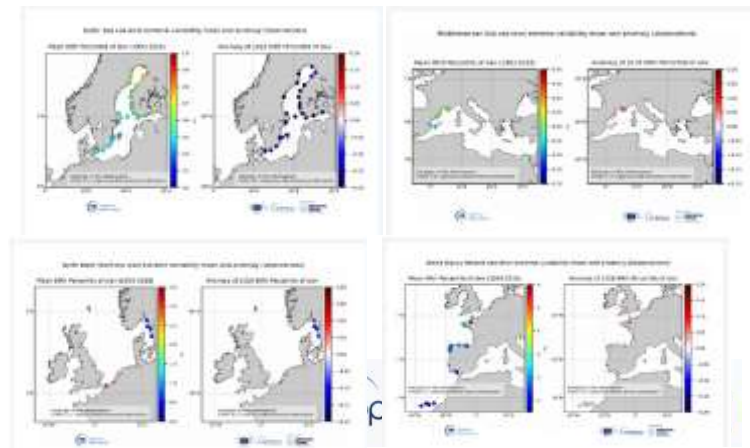
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Altogether 15 in situ **products** within the Copernicus Marine catalogue

→ From ~60 000 different platforms over the world

And 12 **ocean monitoring indicators** providing extreme events in the Baltic, North East Atlantic and Mediterranean seas in terms of temperature, sea level and wave height



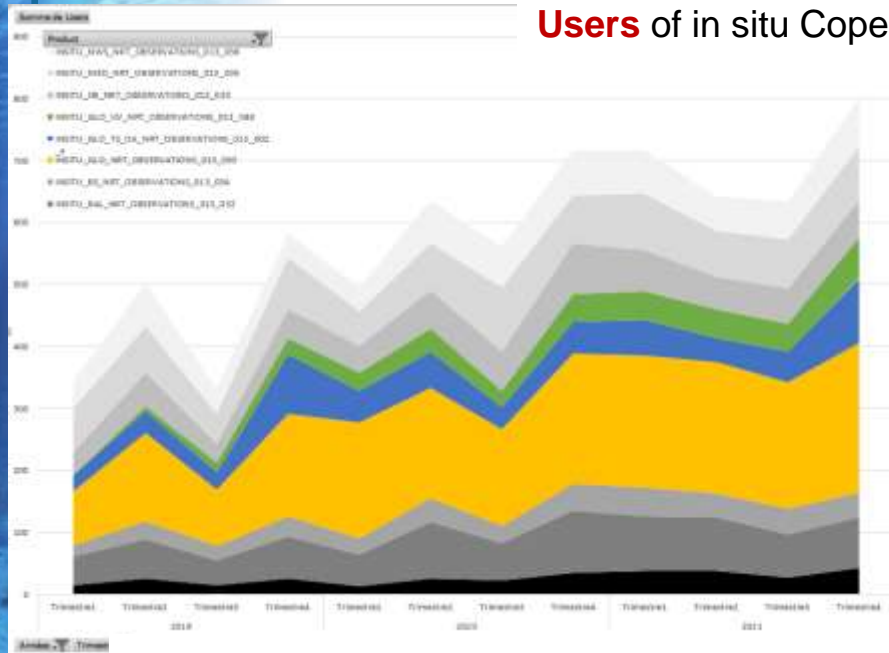


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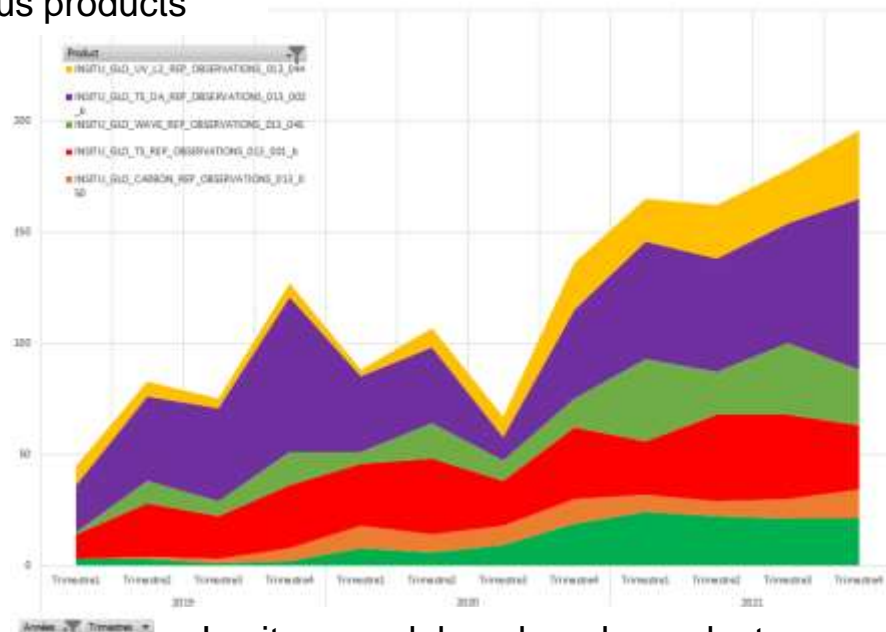
Coastal data in Copernicus marine INSTAC

- In situ products made for the Copernicus marine models (assimilation and validation) and for any external registered users to the service

Users of in situ Copernicus products



In situ near real time products




In situ near delayed mode products



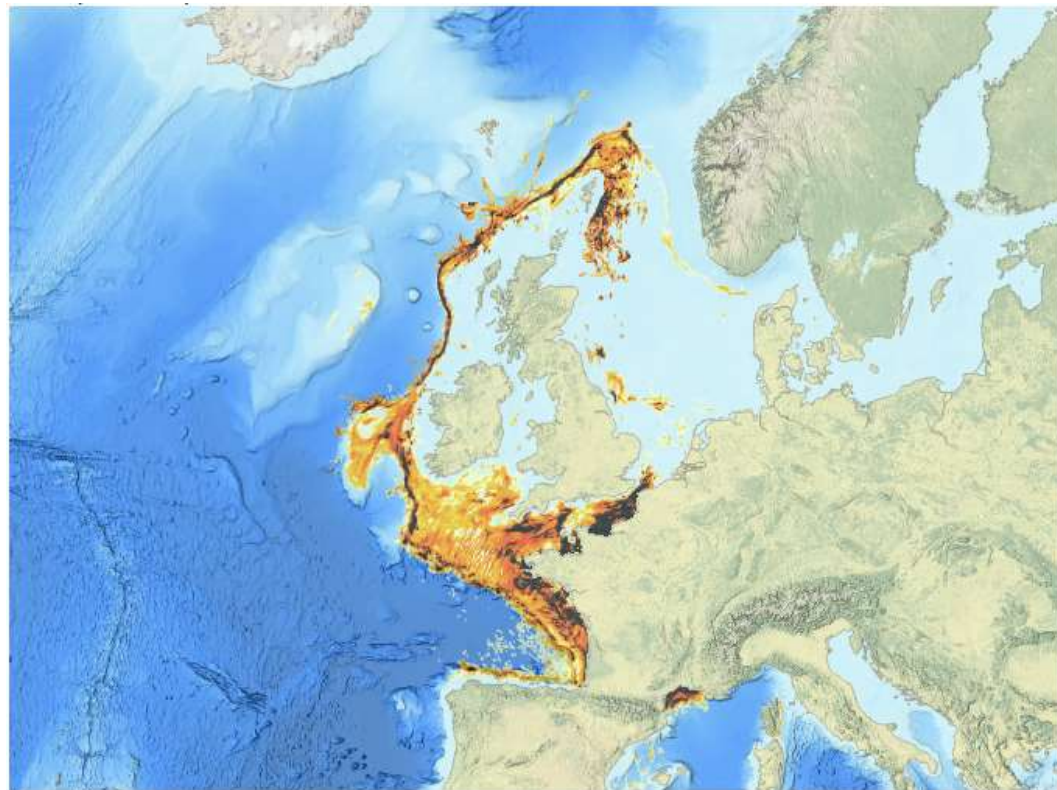
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Improvement and evolution of data in coastal area

A Copernicus service evolution project ADEOS, led by 

Objective of this ongoing project: to derive surface currents from the AIS that equipped the ships – *which most of them are coastal ships*

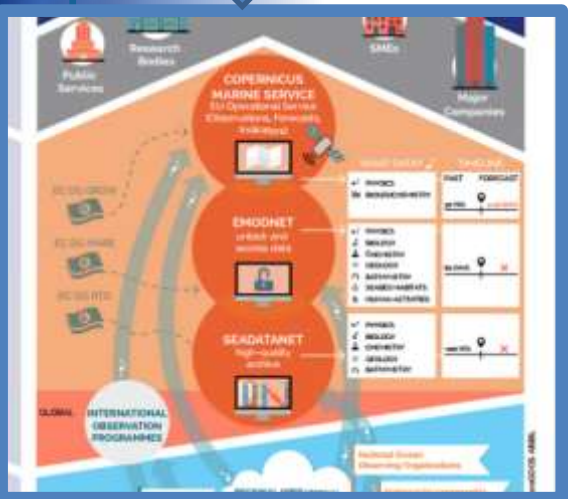
Ifremer fisheries information service:
More than 290 millions data
From nearly 14 000 ships mainly in coastal area
(darker yellow indicates more data)





Marine Monitoring

INSTAC-EMODnet physics & chemistry links



- Unlock & access to data → collaboration between EMODnet physics, chemistry & ingestion and INSTAC (through MIC WG, 2nd meeting 29 Sept) to
 - Reach a new provider in a harmonised way
 - On behalf on the other one (EMODnet to Copernicus & Copernicus to EMODnet)
 - With engagement of feedback on the usage of data to the provider
- Some work also done in the frame of COINS (contracts with EEA) to one side work on data traceability and on the other one to map the differences of platforms ingested in EMODnet and Copernicus (and afterwards reduce it).
 - Physical data (NRT or DM):
 - As soon as unlocked, available in EMODnet physics
 - Quality Controlled (QC) by INSTAC before being added in Copernicus catalogue
 - and also in EMODnet physics (in place of the non-QC data). Completed by min, max, mean product
 - River, atmospheric and acoustic data in EMODnet but not in the INSTAC frame
 - Chemical data (DM)
 - When unlocked, important QC on both side EMODnet and INSTAC. Then in the respective catalogues.
 - Chemical data (NRT)
 - QC in INSTAC then in Copernicus catalogue
 - No NRT chemical data in EMODnet chemistry



INSTAC and EMODnet links **higher level**

- INSTAC is part of the EMODnet for Ocean Decade Coordination Group (E4ODCG)
 - Kick-off meeting last june
- INSTAC will take part on the 1st EU-Canada ocean partnership forum dedicated to International ocean observation & data sharing (3-4 October) organised by DG-MARE



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Overview of JERICO

- Integrated pan-European (19 countries, ~40 partners) multidisciplinary and multiplatform RI dedicated to a holistic assessment of coastal marine changes
 - Potential of JERICO RI: a EU coastal system
 - System of local and regional platforms
 - Built on national and EU- e-infra
 - Built on national capabilities
- More than 500 platforms listed. Physical, biogeochemistry and biological variables*
- With 3 key scientific challenges
 - Assessing and predicting the changes of coastal marine systems under the combined influence of global and local drivers
 - Assessing the impact of extreme events on those changes
 - Unravelling the impacts of natural and anthropogenic drivers of climate change



JERICO-RI, the Joint European Research Infrastructure
for Coastal Observatories

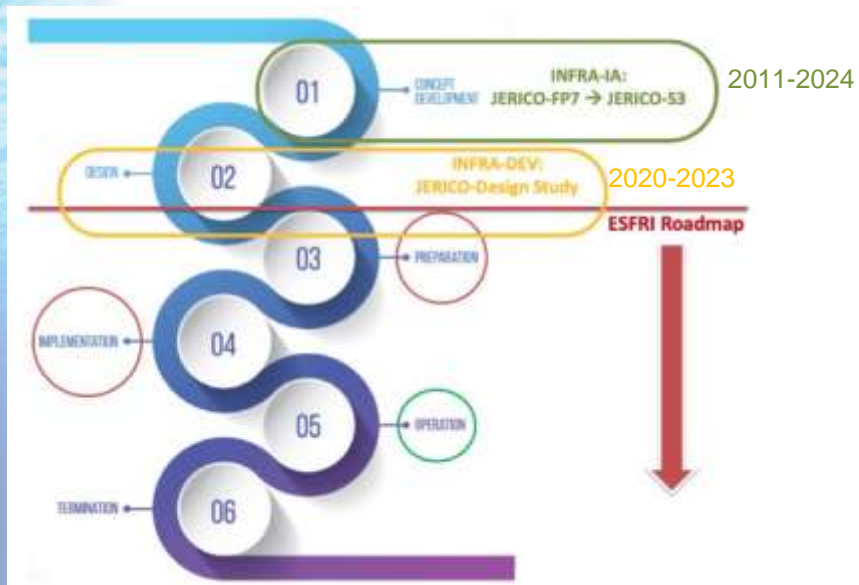
Laurent Delauney – Coordinator JERICO-S3 and JERICO-DS
Ifremer Brest

Science Objectives





JERICO status



→ today: JERICO consortium is between concept development (institute driven) & design study (nation driven) phases

→ Jerico-S3 project objectives, to provide

- state-of-the-art, fit-for-purpose and visionary observational RI
- Expertise and high quality data on European coastal and shelf seas
- And to support research, innovation and be a window of European excellence worldwide

→ Jerico-Design study project objectives

- To build the RI on nations
- To propose a business plan and governance strategy





Interaction between Jerico and Copernicus

Obvious links and common interests on coastal areas

→ JERICO: member of the INSTAC stakeholder board

- Next meeting on 28 September
- With coastal session to share common objectives + agree on first common activities (*sharing on data / platforms, QC on data, how to increase FAIRness, traceability of providers, user statistics ...*)

JERICO data

- ❖ Strong analyses of bio-geo-chemical processes (thanks to research community involved)
- ❖ Data from coastal observatories include variables such as turbidity, carbonate and biological data: benthos population and e-DNA.
- ❖ New platform types as: bottom-based observatories, manual sampling.
- ❖ Ensuring sea and land continuum (then taking account on anthropogenic drivers)
- ❖ Scale form long term changes to extreme events



To be integrated in INSTAC

- ❖ QC of data could be done on both sides (JERICO & INSTAC)
- ❖ Coastal data to be added to existing INSTAC products and to become new products

A strategic position within the RI Landscape
The Coastal Domain at the interface betw. Land and Ocean

