

Copernicus Land Monitoring Service



Land Monitoring

Perspective from the land

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European Environment Agency



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Why monitoring CZ?

(Besides being just beautiful) Coastal regions are tremendously important for Europe's economy.

- Approximately 40 % of the EU's population lives within 50 km of the sea.
- Almost 40 % of the EU's GDP is generated in these maritime regions, and a staggering 75 % of the volume of the EU's foreign trade is conducted by sea.
- Urbanisation, tourism, shipping, resource extraction, renewable energy and fishing are all putting pressure on marine and coastal areas. This has resulted in habitat loss, pollution and accelerated coastal erosion.
- Climate change is likely to make these regions - and the societies that live in them - more vulnerable.

Map 1.2 Population trends in European coastal regions, 2001-2012



Source: FICUSA, population data by coastal region (NUTS 3) from Eurostat.

EEA report | No. 07/2013

Balancing the future of Europe's coasts

— knowledge base for integrated management



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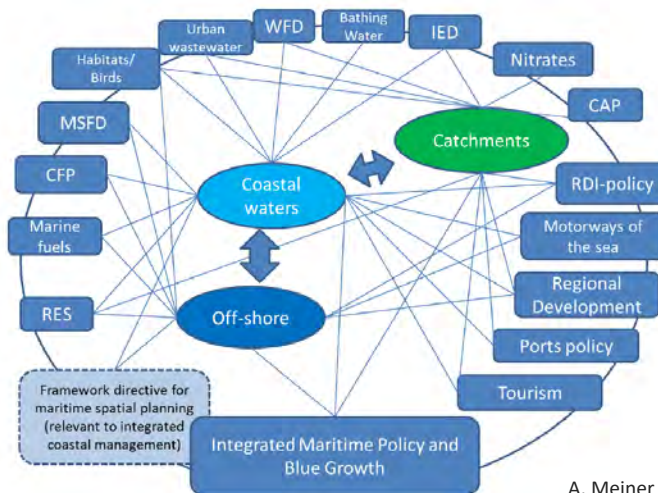


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Landscape of policies/directives?

The EU has installed a dense network of regulations and directives, with the intention to allow economic prosperity while at the same time improving and maintaining the status and protective functioning of coastal ecosystems in Europe.

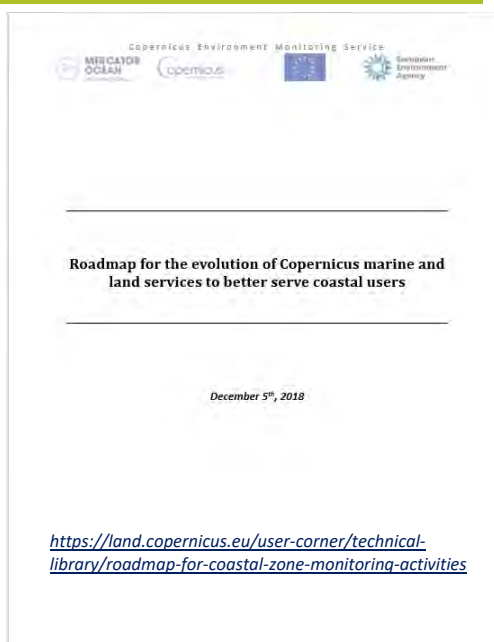



A. Meiner (EEA)



The goal

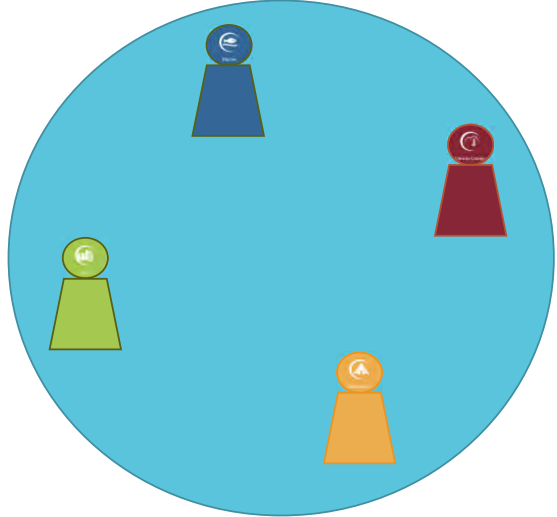
The essence is that nowadays coastal zone management experiences a conflict between economic development (growth and jobs) and sustainable environment, and there is a need for bridging knowledge (data/information and methods/tools) and governance (decision-makers at every level) in order to **ensure social and ecosystem resilience**. This is where Copernicus services play a key role in delivering detailed and long-term information essential for decision makers and downstream services.







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Copernicus Knowledge Hub


Coastal Zones are at thematic border between CLMS and CMEMS, + areas with particular relevance for CEMS and C3S.
Putting together C*S competences + cross service coordination is considered the winning recipe!





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The full picture is needed

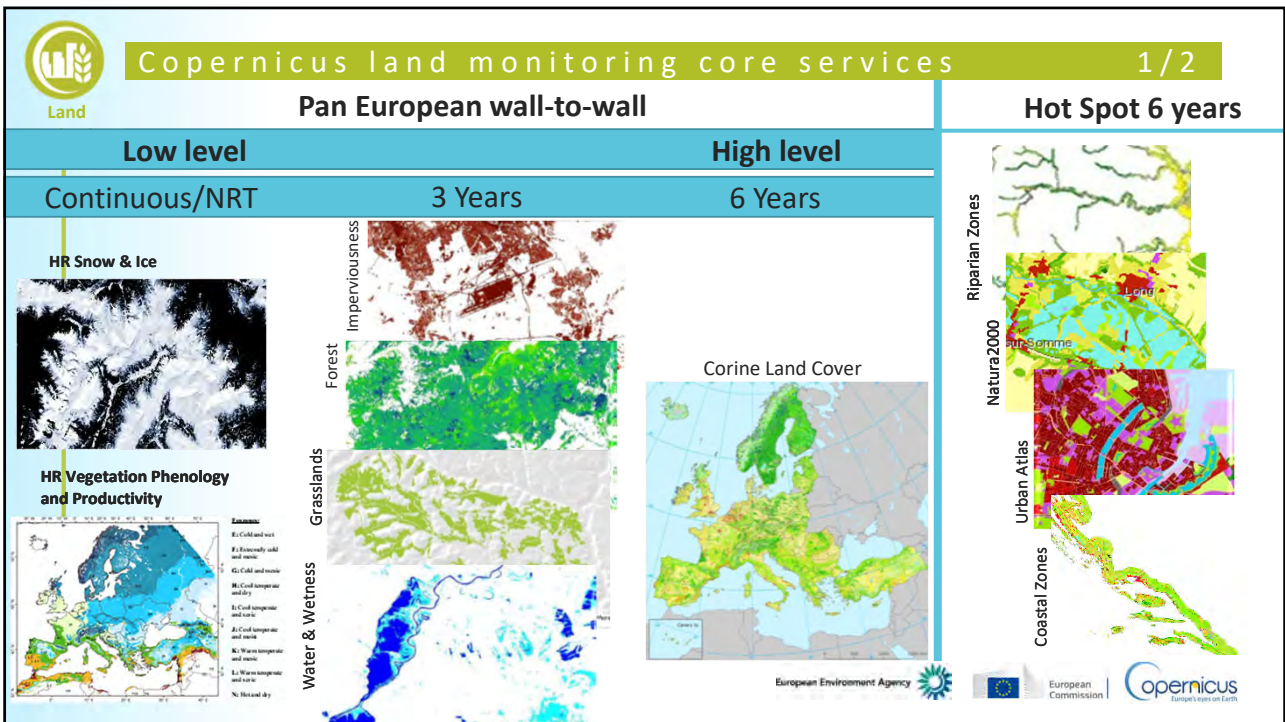
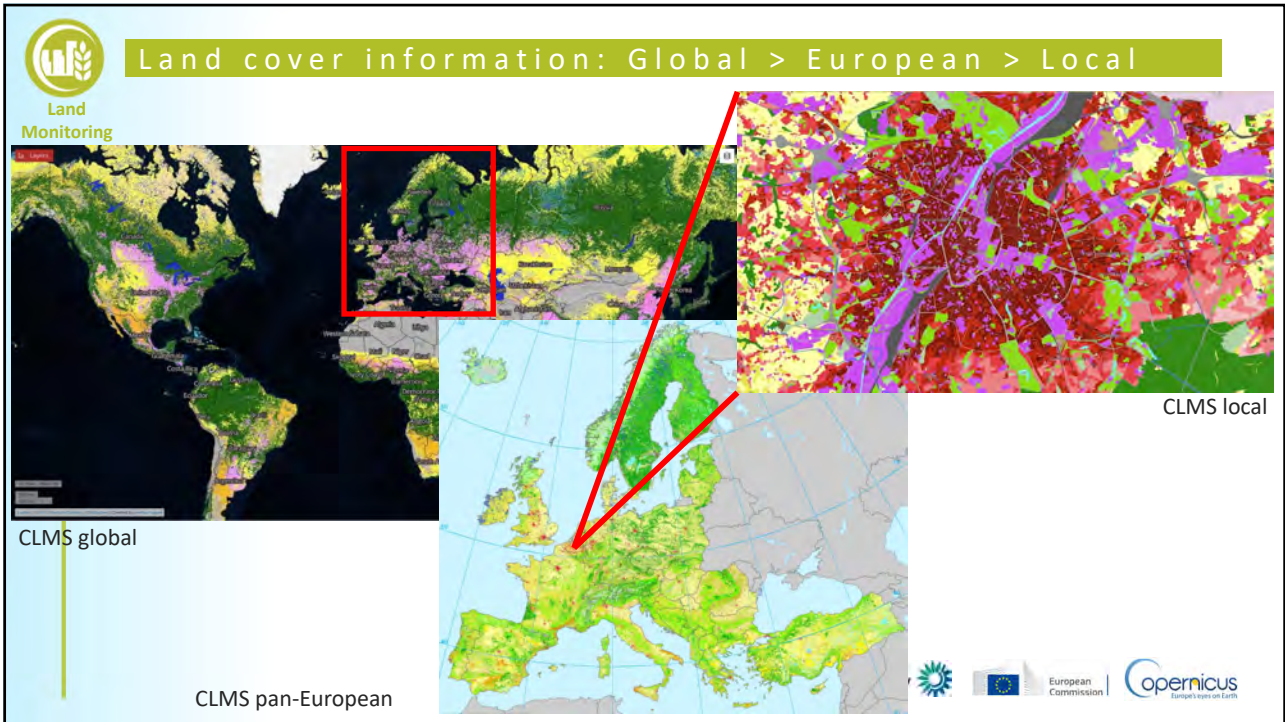
 CLMS is the dealing with land areas, thus it delivers information relevant for spatial planning, vulnerability assessments, ecological status of the landscape etc. **But 'land' is just the half the picture in coastal zones.**


 CLMS delivers information mostly on the 'impact side' but for the 'hazard side' knowledge from CMEMS and the other services is needed.

 Vulnerability, coastal erosion, sea level rise impact etc. are always the equation of sea, land, and weather aspects.



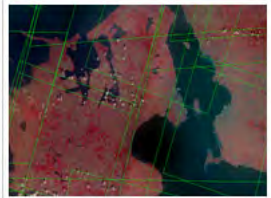
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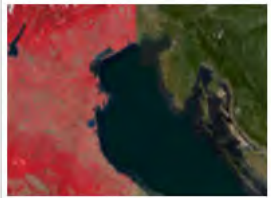
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Global on demand mosaicking service

Global Image Mosaics




Mosaic of VHR data 2012 and 2018

European Image Mosaics


EU-DEM 1.1 (EEA)
COP-DEM: GLO-90
GLO-30
EEA-10




EU-DEM




River and lakes with topology
Based in Modelling and Photointerpretation of VHR data

EU-Hydro





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EU-Hydro

River Basin District

Coastal_p

Transit_p

River_net_l

River_net_p

Ditches_p

Ditches_l


InlandWater

Canals_p

Canals_l

● = Nodes

● = Culverts
(Crossings of rivers or canals without having a connection)

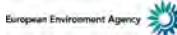




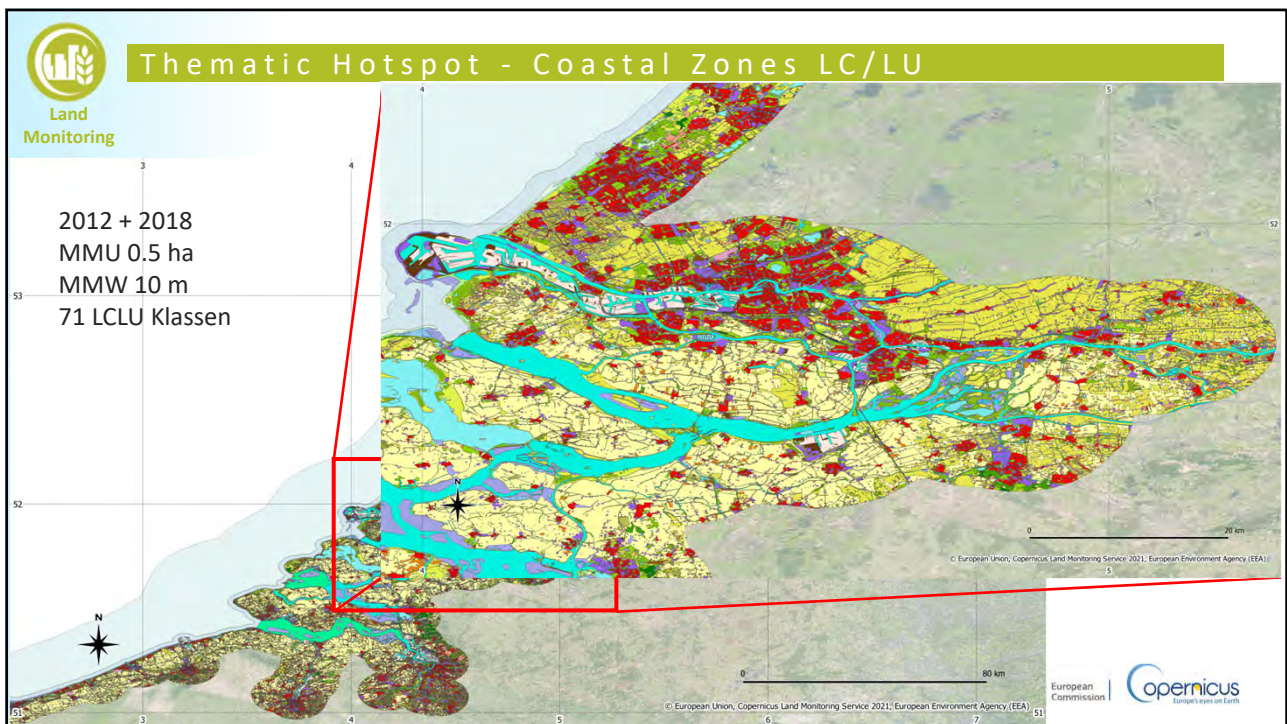
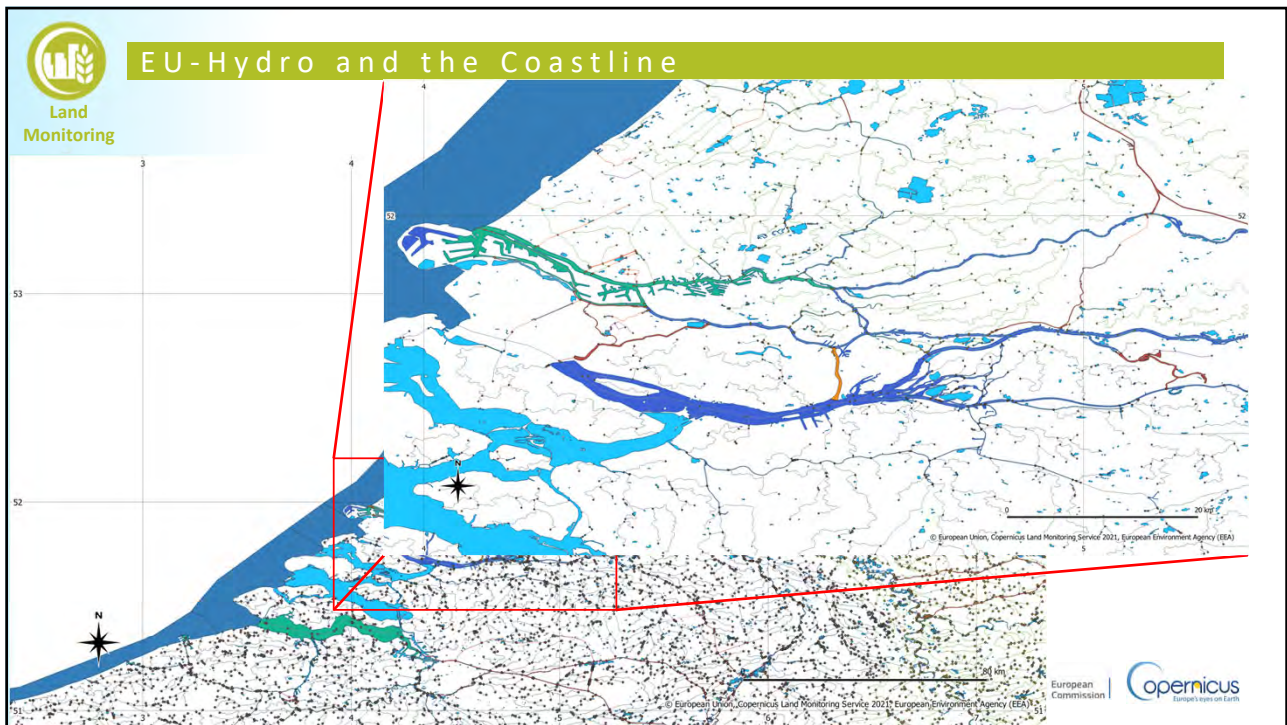
EU-Hydro


Coastal and transitional waters

Inland waters

Topological relationships in EU-Hydro data model.





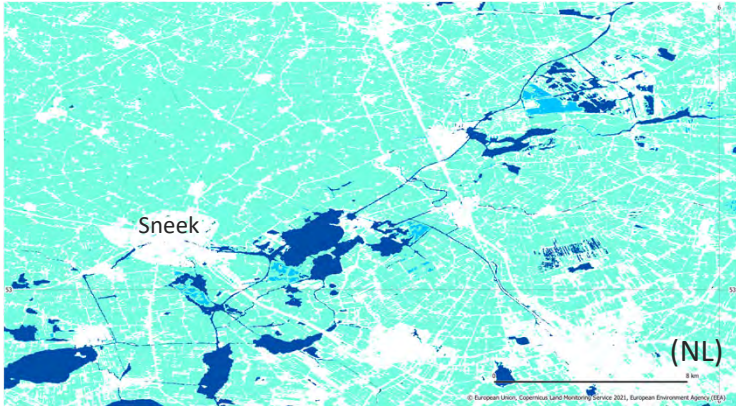
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High Resolution Layer - Water and Wetness

Raster Layer 10m x 10m
2015 – 2018 (– 2021 ...)
Multiyear observation period
combining S1 and S2 data.


Classes:


- permanent water
- temporary water
- permanent wetness
- temporary wetness



Sneek (NL)

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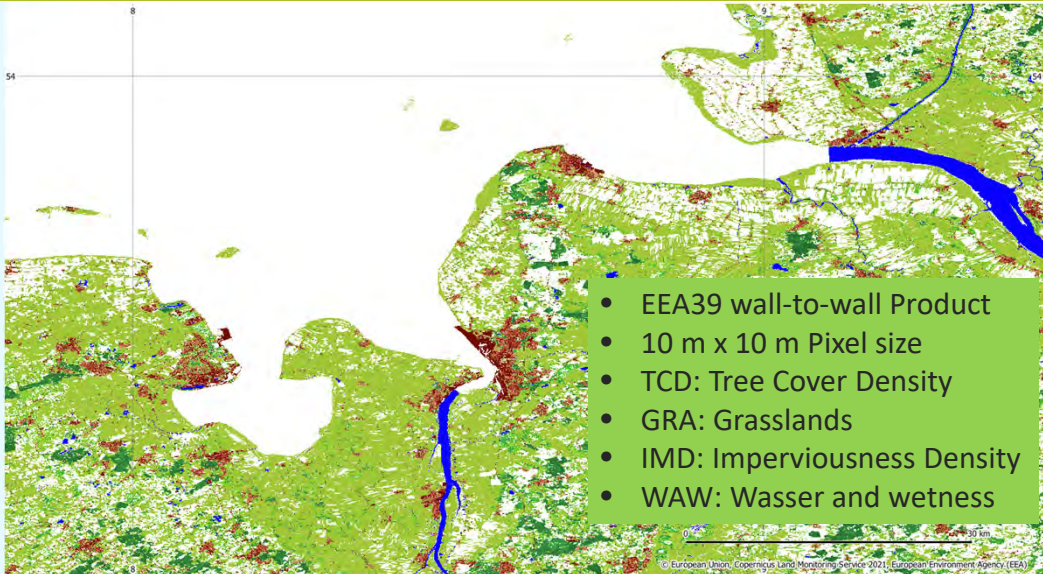





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Pan European - High Resolution Layers

- EEA39 wall-to-wall Product
- 10 m x 10 m Pixel size
- TCD: Tree Cover Density
- GRA: Grasslands
- IMD: Imperviousness Density
- WAW: Wasser and wetness



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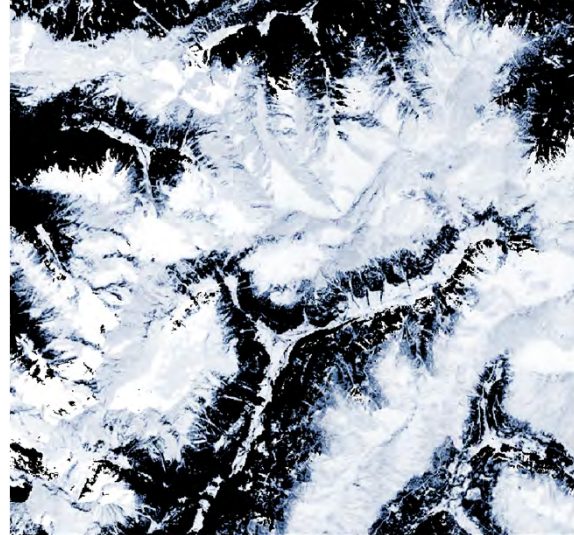




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Biophysical Parameter – High Resolution Snow and Ice

- Raster Layer 20m x 20m
 Continuous/NRT (6-12h after sensing)
 Based on S1 and S2
- Snow layers:
1. NDSI
 2. Fractional Snow Cover
 3. Wet/Dry Snow
 4. Permanent Snow Area
- Ice layers:
1. River and Lake Ice
 2. Aggregated River and Lake Ice



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Plans/ CLMS Evolution

1. Unify Coastal Zones and Riparian Zones LC/LU to a ,Water' LC/LU dataset (e.g. for better addressing of WFD)
2. Make EU-Hydro to a central container for water related information (e.g. in situ data).
3. Mapping of coastal protective structures

mapping → monitor
static → dynamic

4. Reorganising the CLMS Portfolio: ,Abiotic', ,Biotic', und ,Cryo- und Hydrosphere'
 - a) Continuous/NRT monitoring of the Hydrosphere (Surface water)
 - b) Combining In situ data with EO data.
 - c) Extract relevant (CZ) parameters:
 - i. Tides (min, max, mean, etc.)
 - ii. Erosion/Accretion (Sediment Balance)
 - iii. Water discharge
5. Satellite based monitoring of der water quality (e.g. algae blooming, turbidity)
6. Cooperation and coordination with other Copernicus services (mainly CMEMS but also CEMS and C3S)



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Thank you!



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Visit:

<https://land.copernicus.eu/>

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