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UNDERSTANDING RISK
GLOBAL FORUM 2024

TRADITION • INNOVATION • RESILIENCE

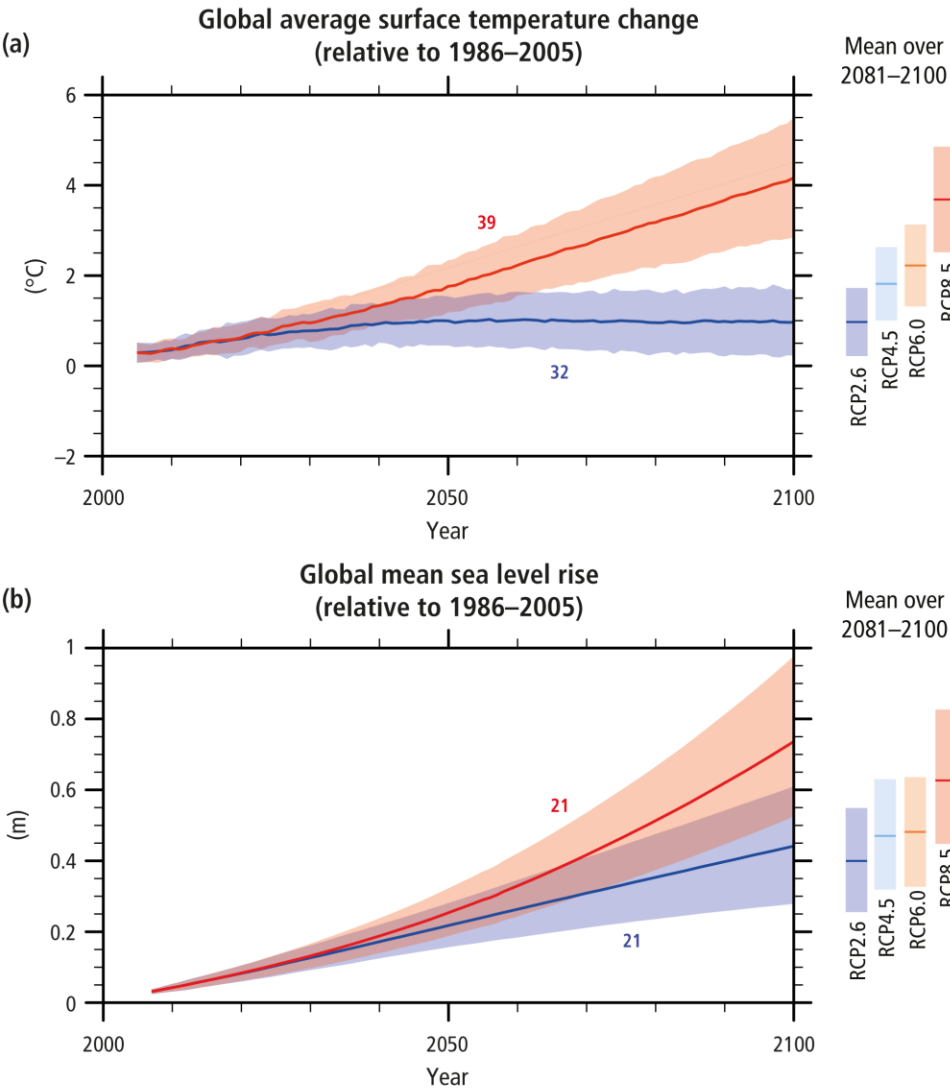
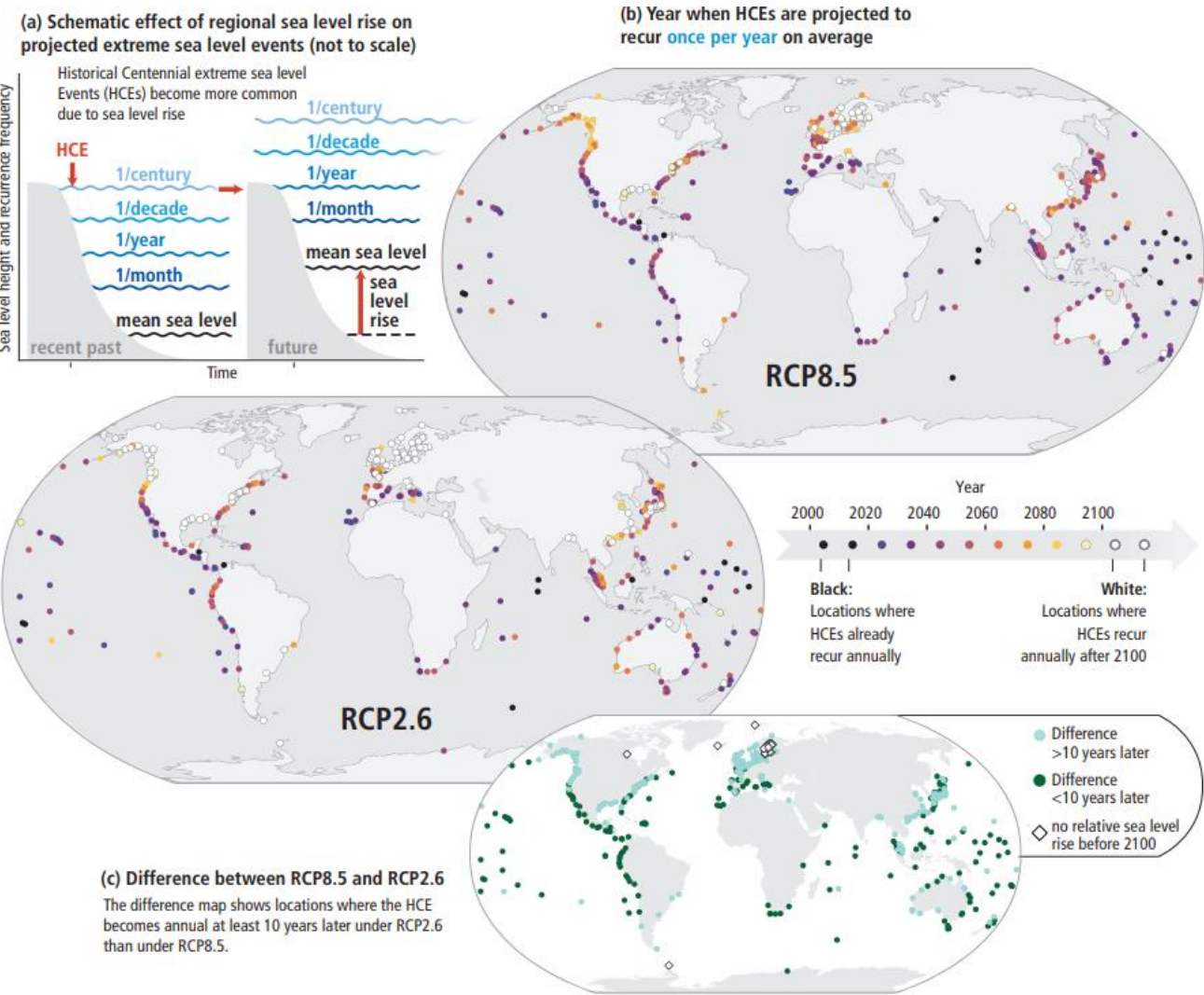
EO monitoring for coastal dynamic assessment

Speakers:

Anne-Laure BECK



User need summary



What is needed ?

- High temporal frequency

Spatial scale (m)	Time-Scale					
	Micro		Meso		Macro	Meta
	Seconds-hours	hours-seasons	Seasons-years	Years-decades	Centuries	Millennium
Micro mm-100m	Turbulence Sand Transport Waves	Vegetation Armouring Beach state Storm erosion				
Meso 100 m-km	Beach restoration/ Resilience			Beach rotation		
Macro 1-10 km					Backbarrier dynamics Shore profile change	
Meta >10 km					Climate change Sea-level rise	



February 2016



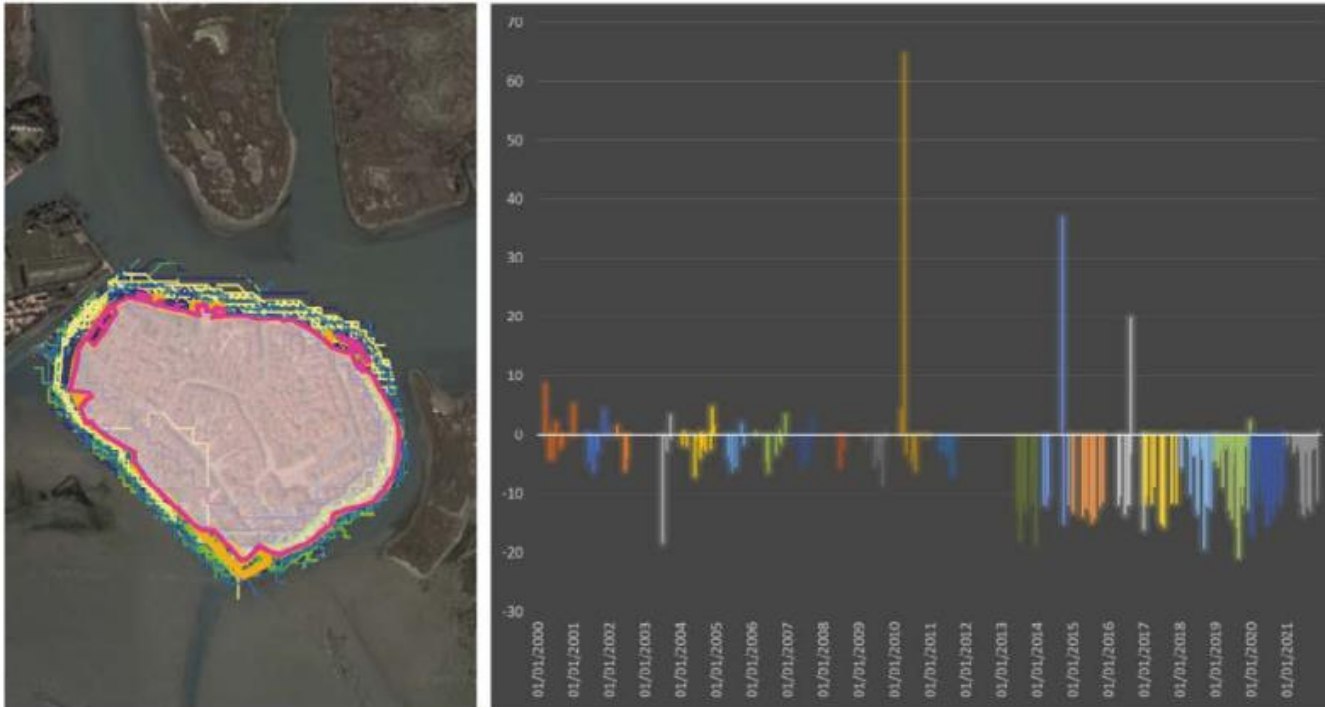
June 2016



Sept 2016

What is needed ?

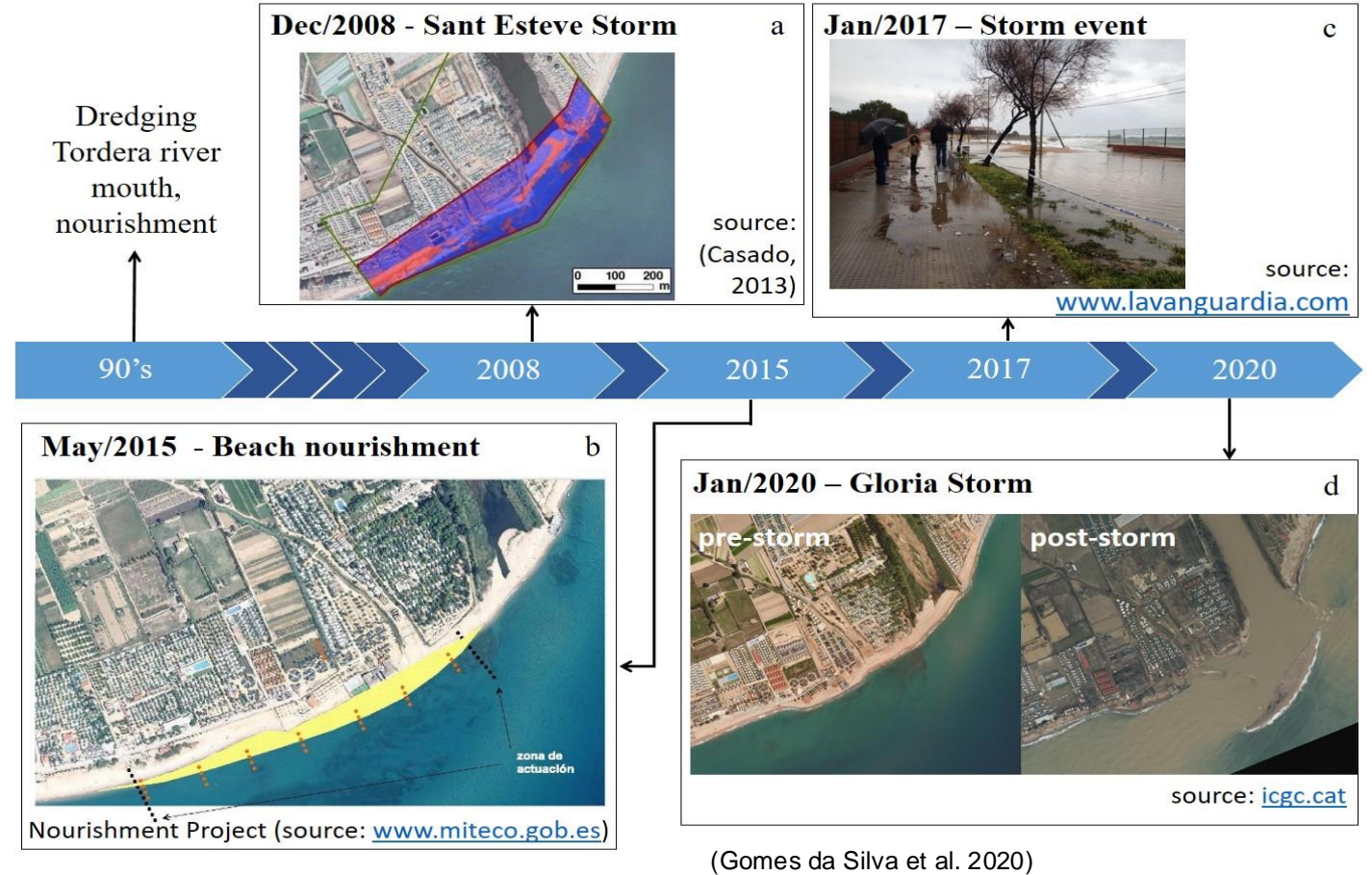
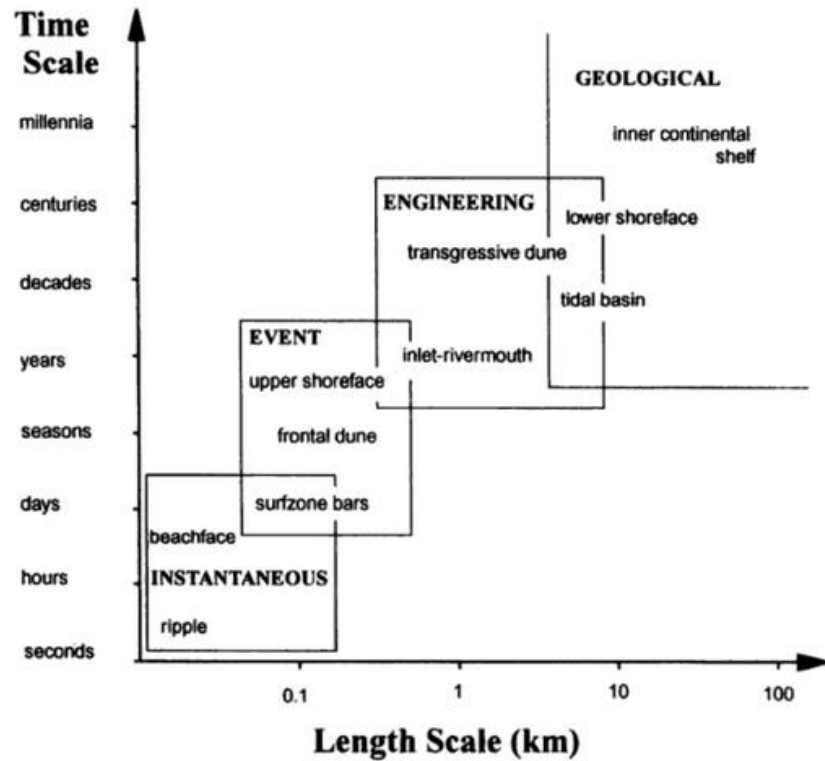
- A real coastline



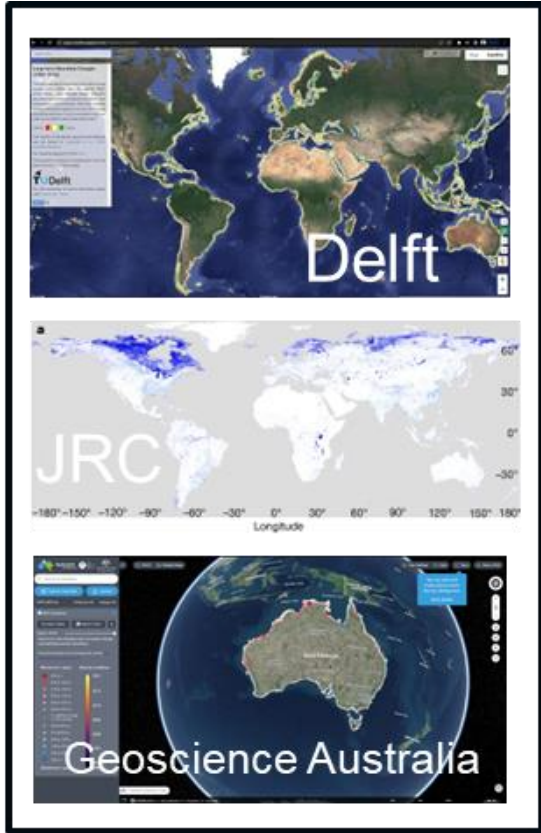
(D'Ascola et al., 2022)

What is needed ?

- High spatial accuracy



Existing Open-source solution



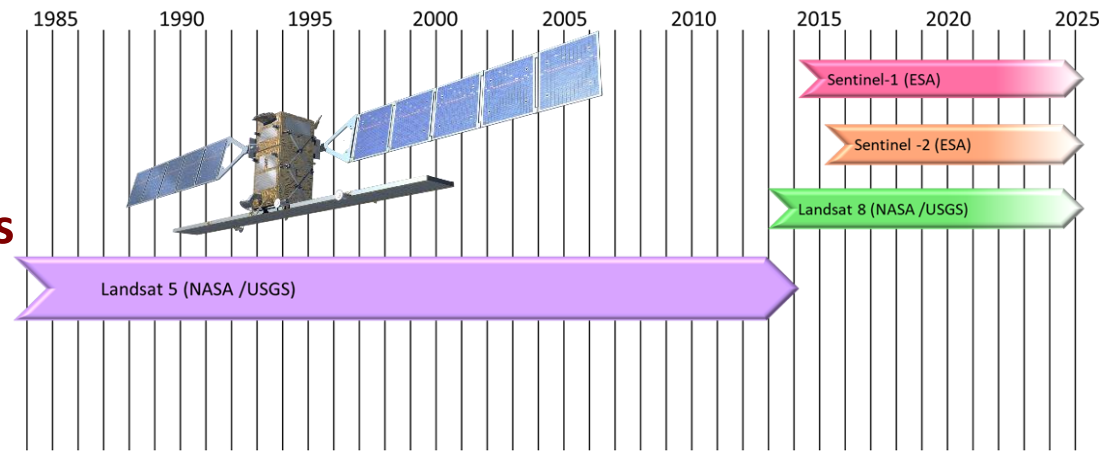
Composite images are made up of two or more photographs, which are combined to create one image



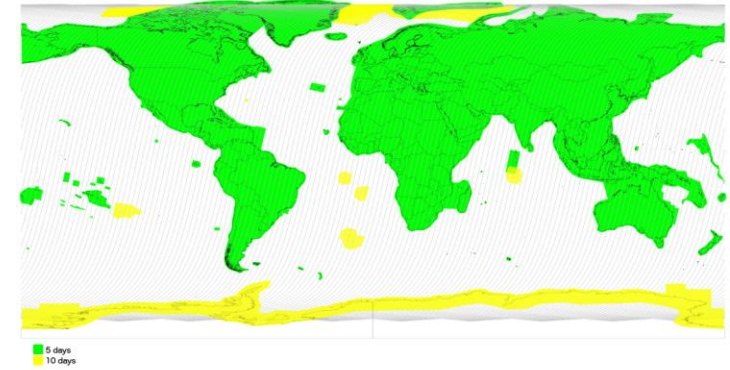
UK COASTAL RESEARCH CONFERENCE, PLYMOUTH, 6TH JULY 2023

Our solution

- Using all available images



Sentinel-2 Constellation Observation Scenario:
Revisit Frequency



- A real representation



- High spatial accuracy



Data Selection



Cloud cover : 0,21 %



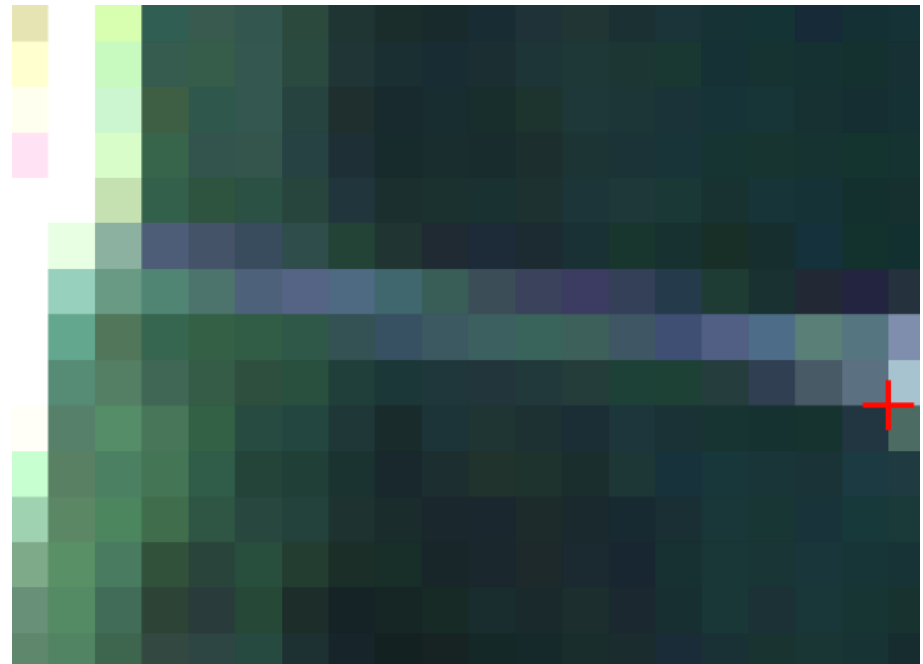
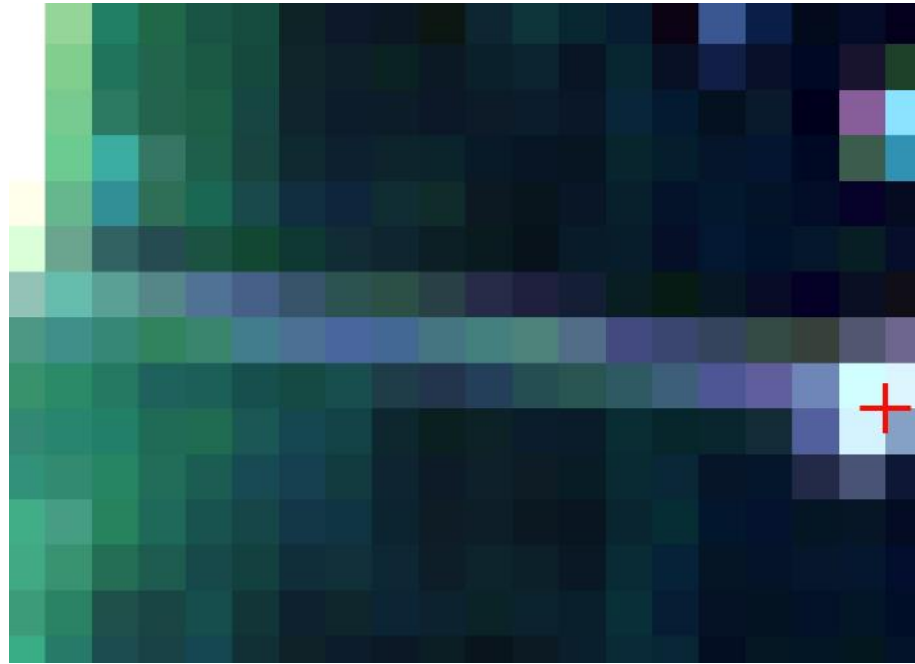
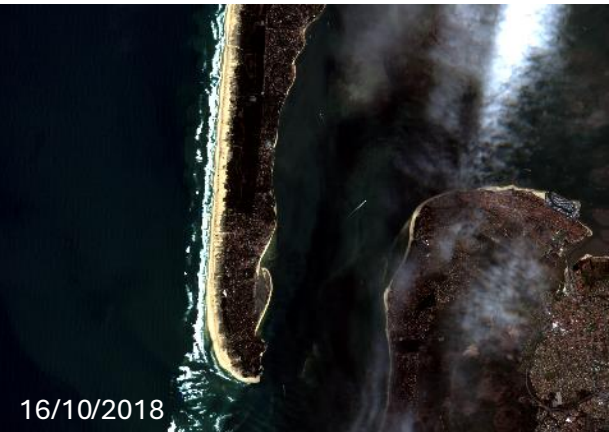
Cloud cover : 45,08 %



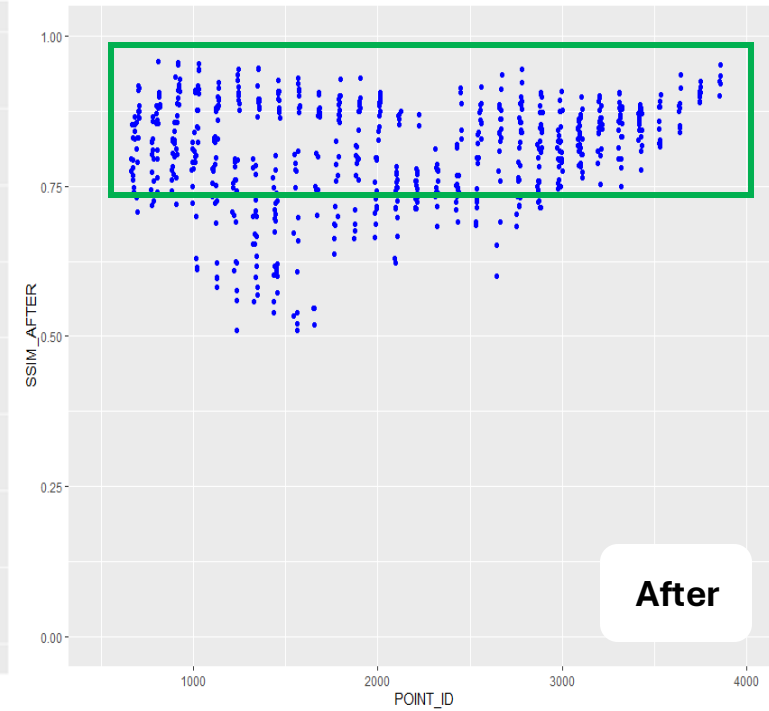
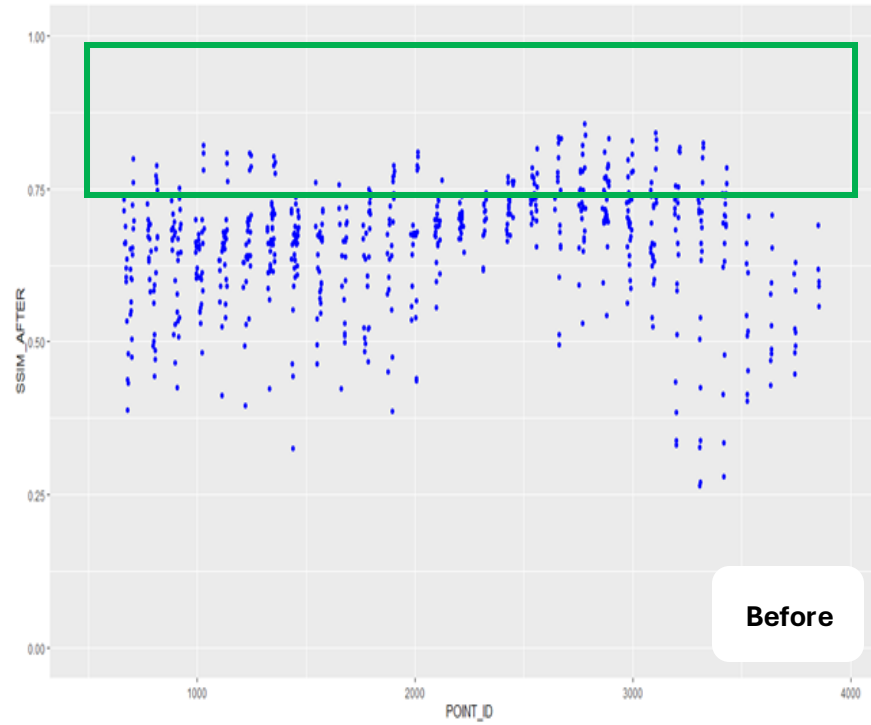
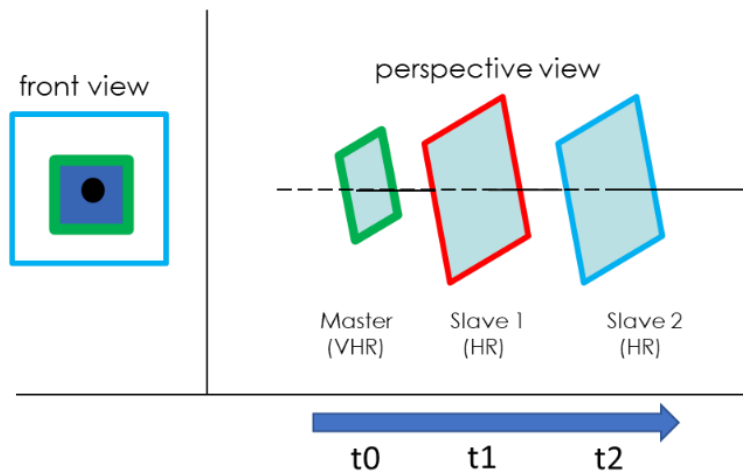
Cloud cover : 20,11 %



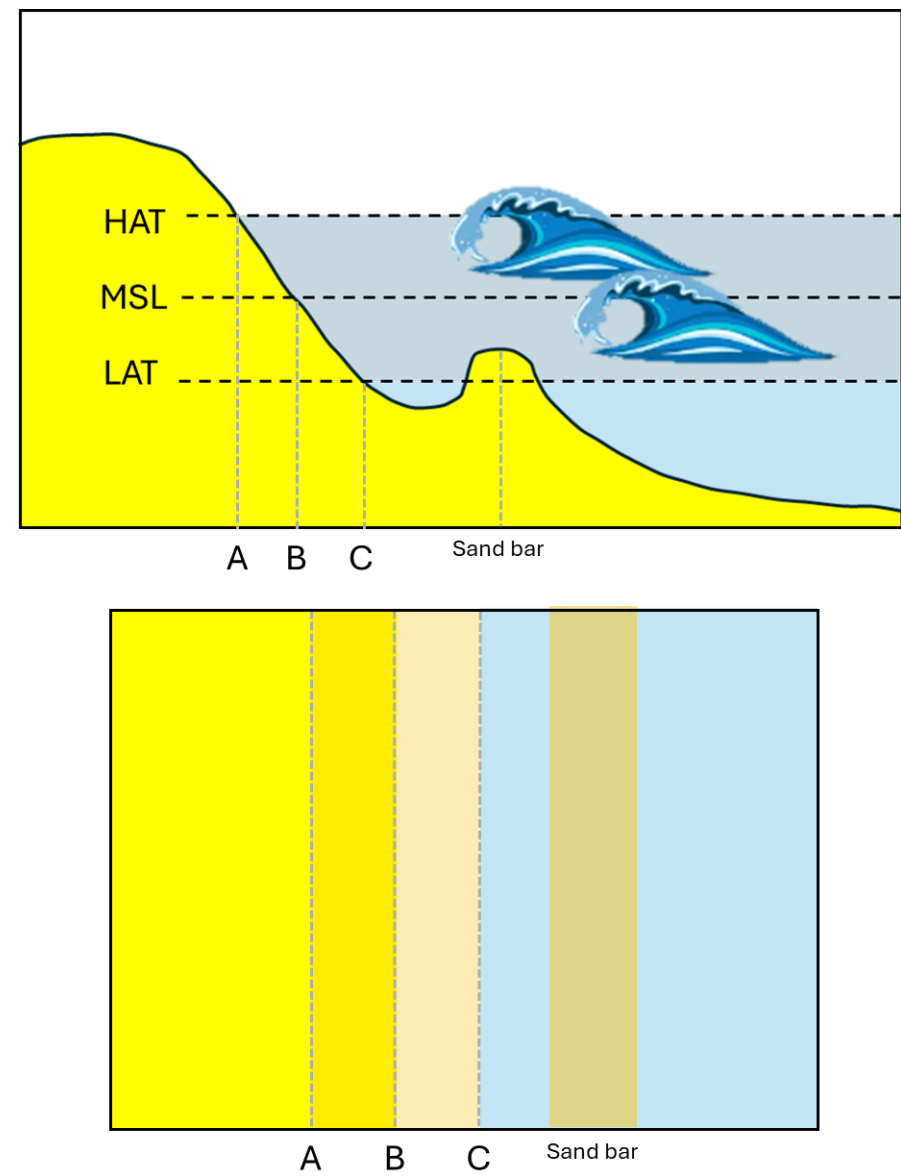
Co-Registration



Co-Registration



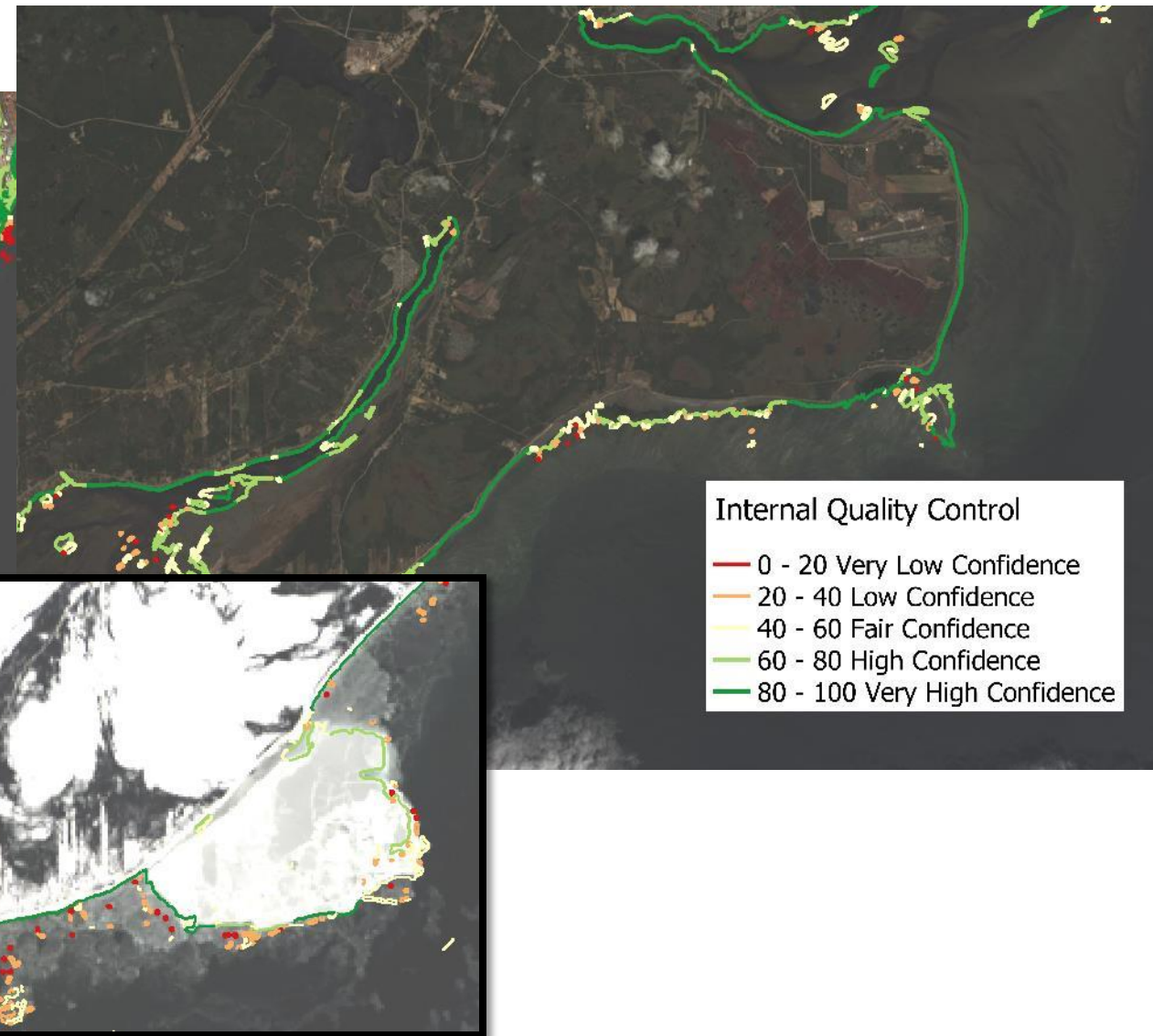
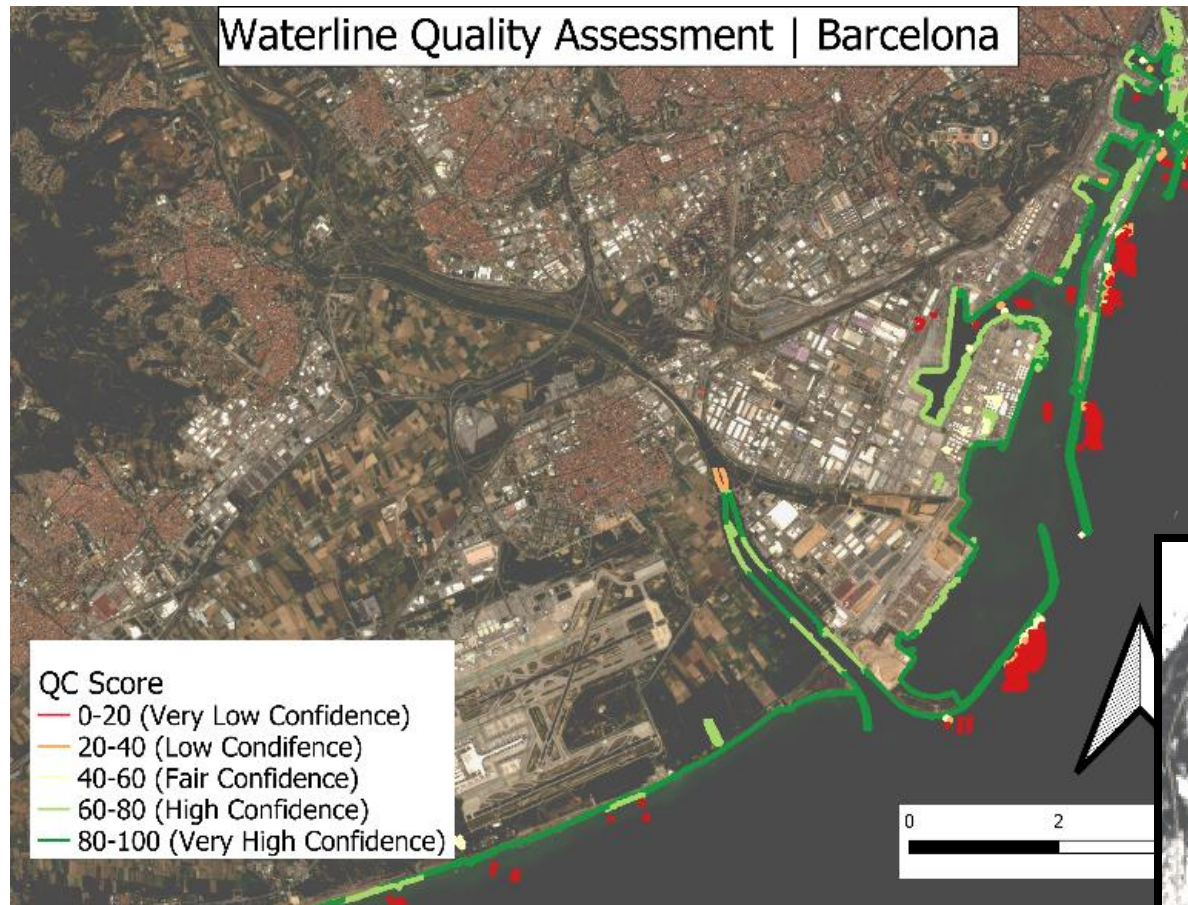
Waterline



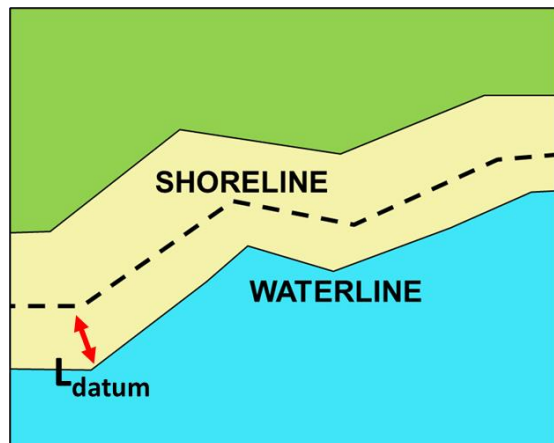
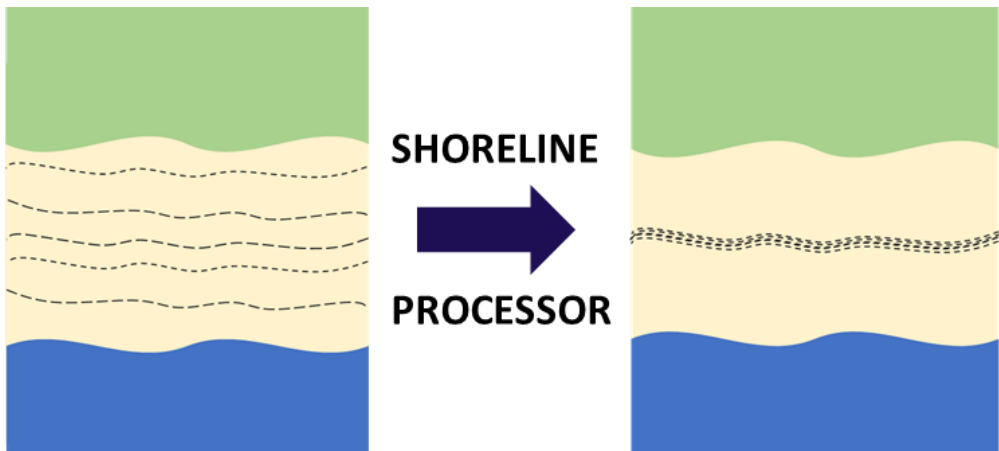
Waterline



Waterline



Shoreline

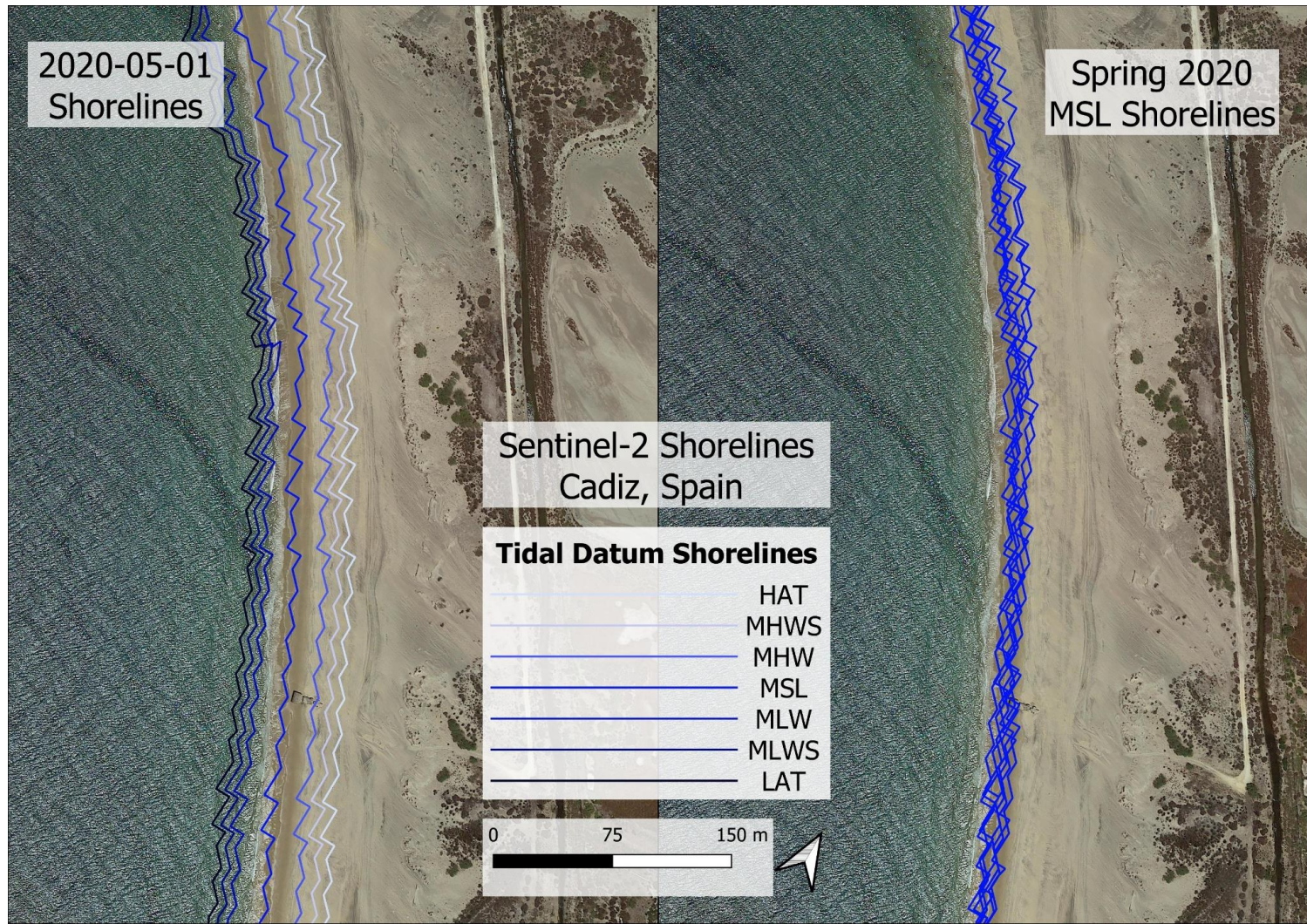
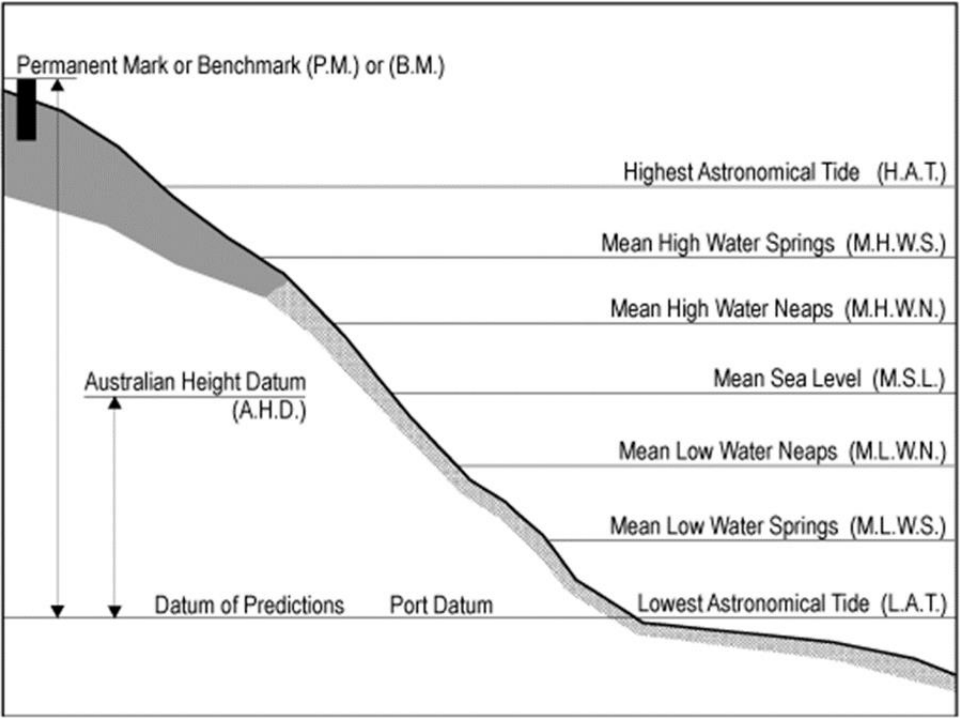


Waterlines

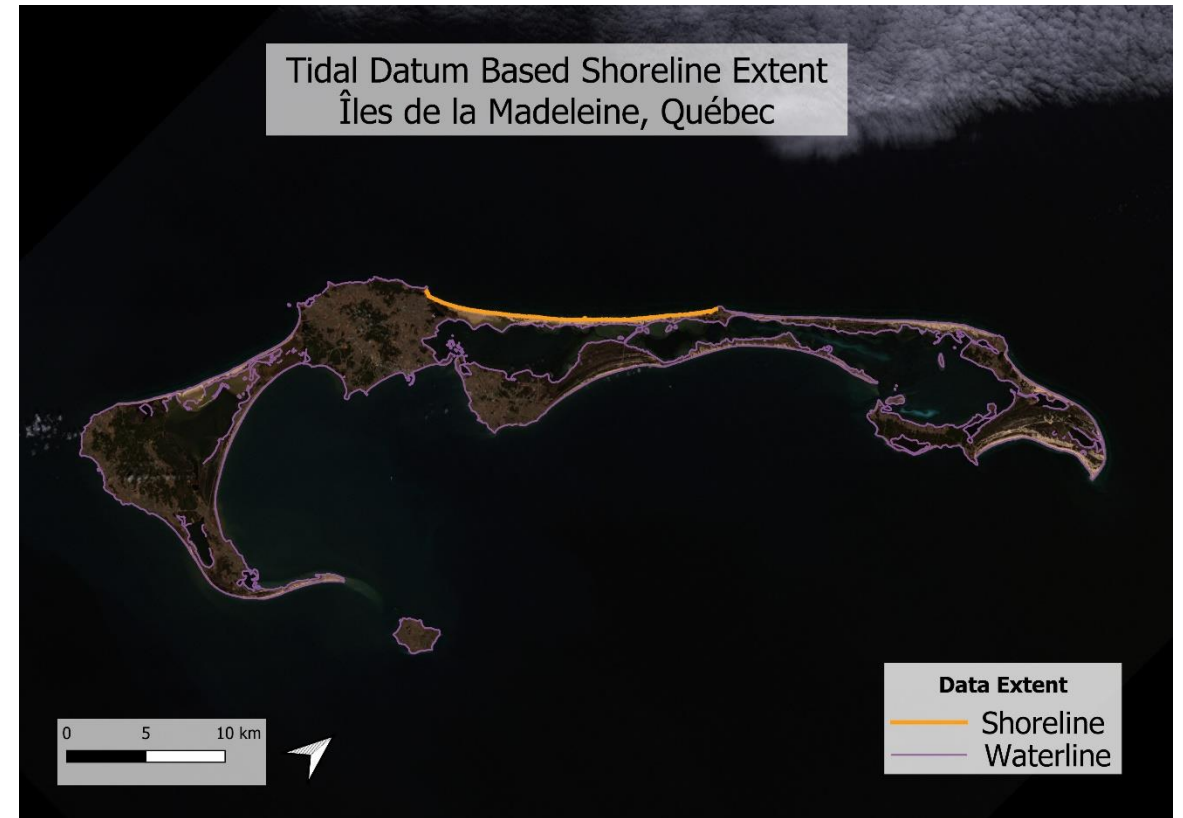
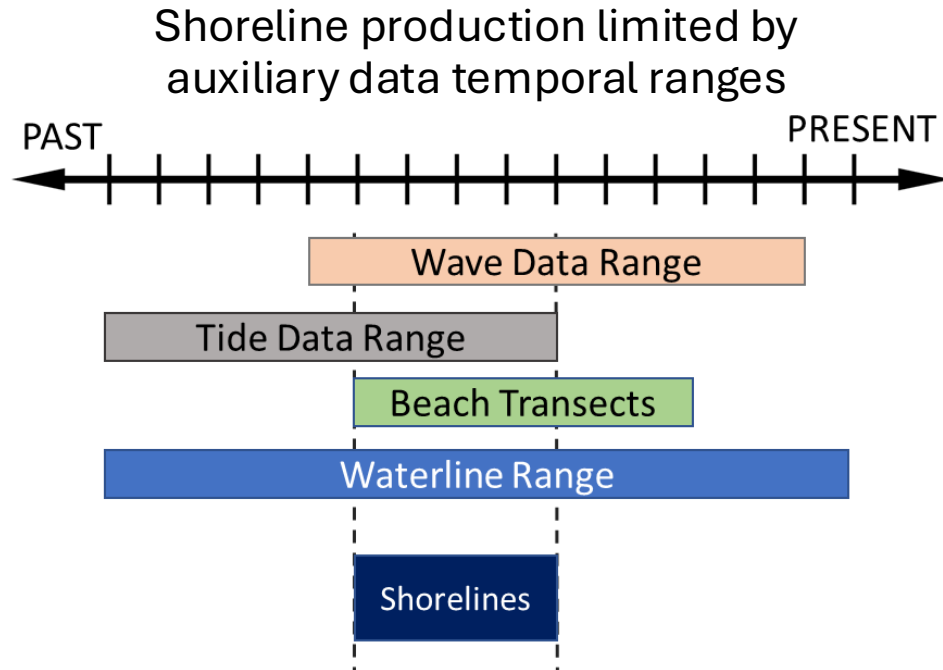


MSL Shorelines

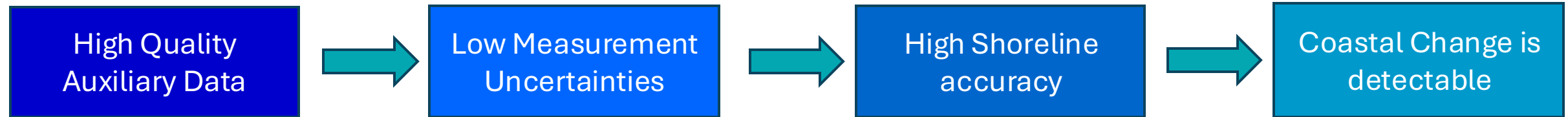
Shoreline



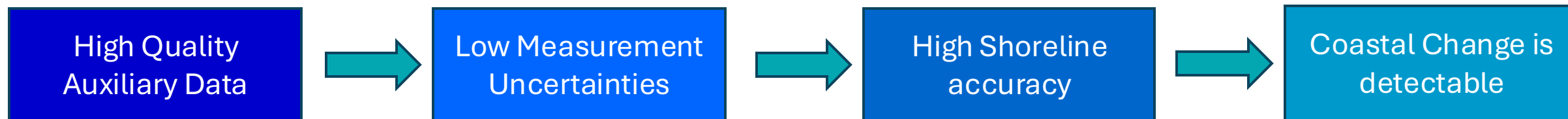
Shoreline



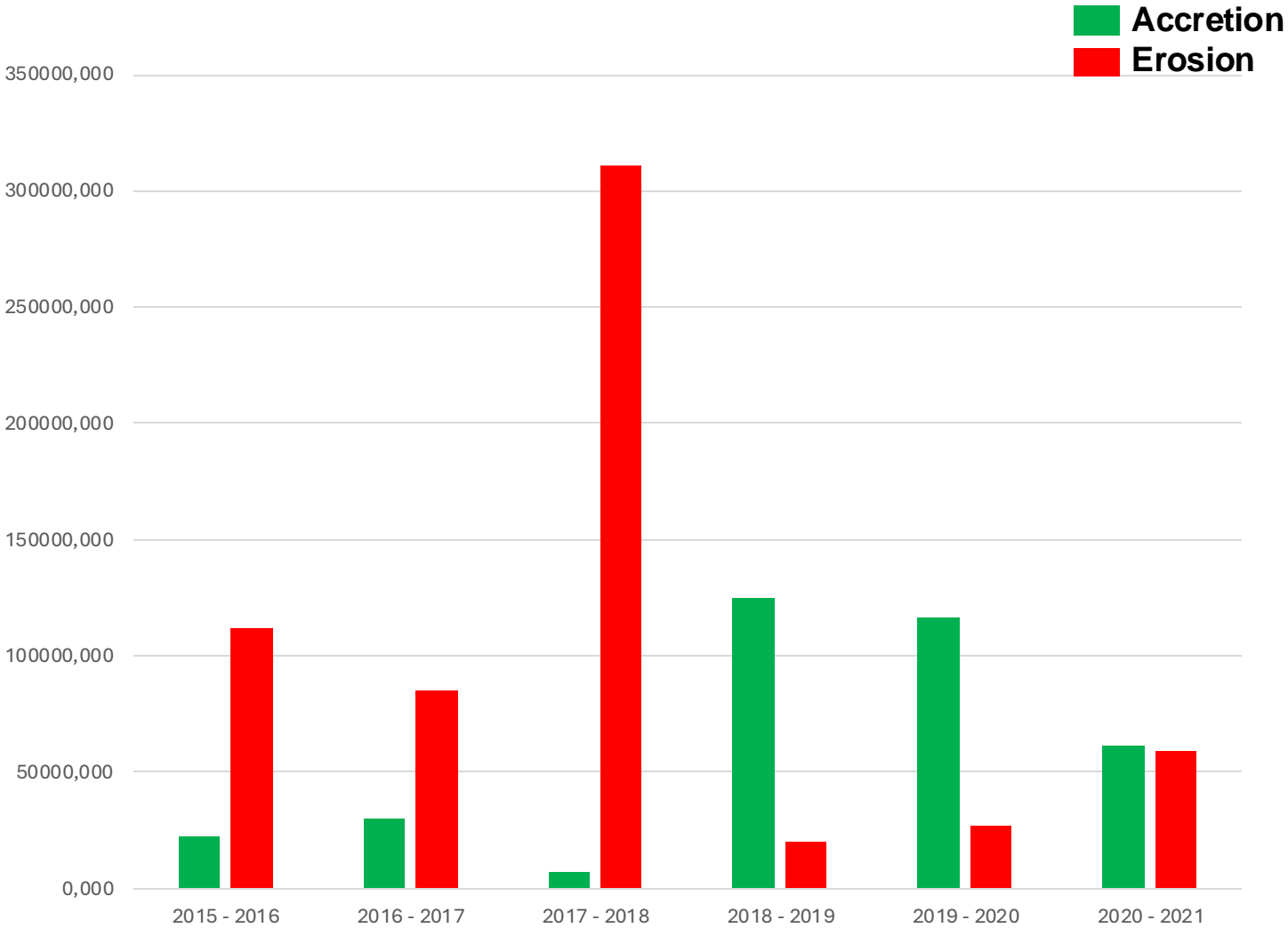
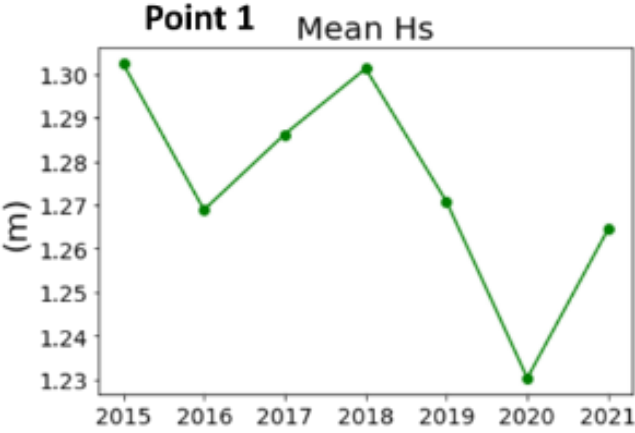
Time series



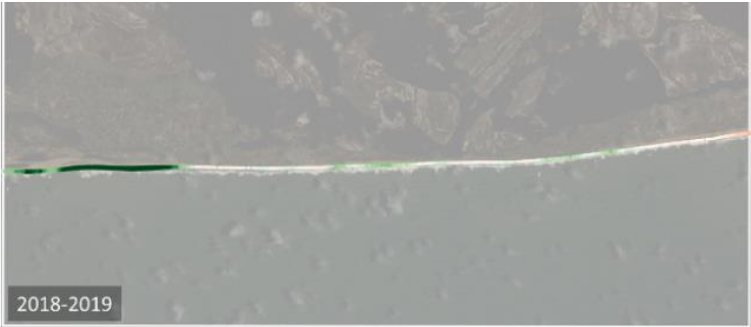
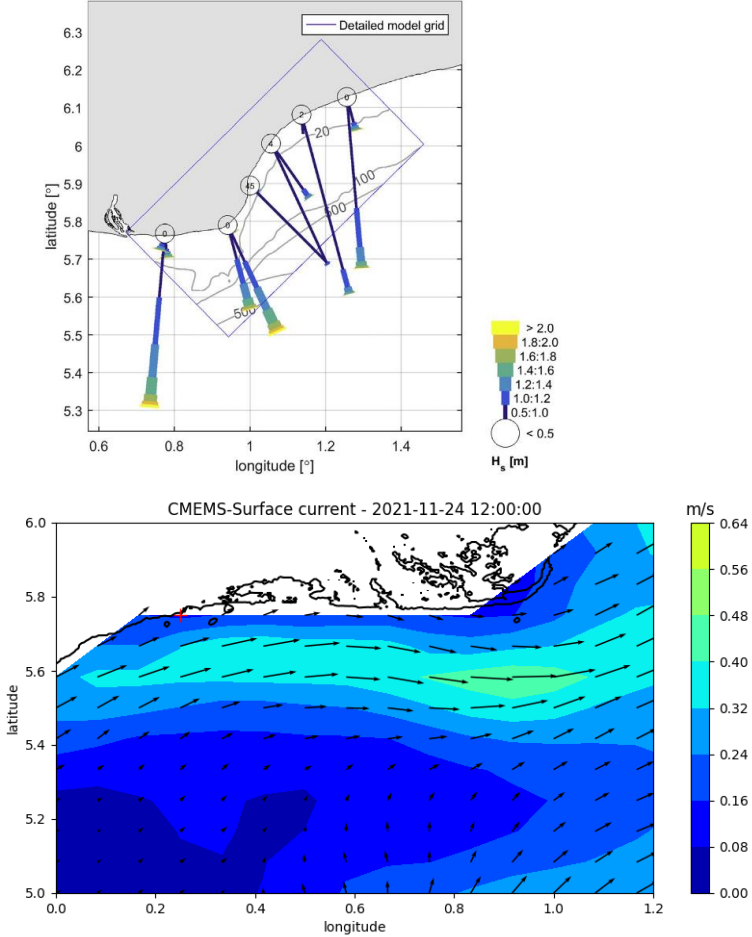
Time series



Time series

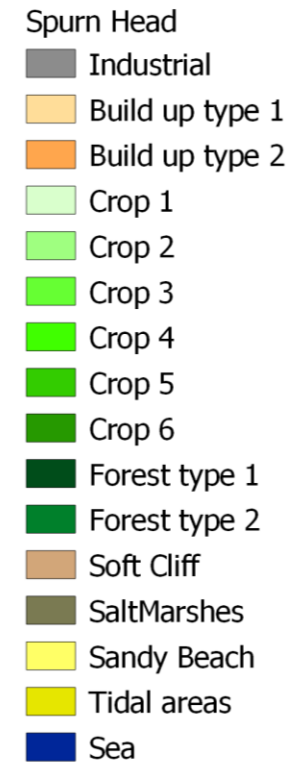
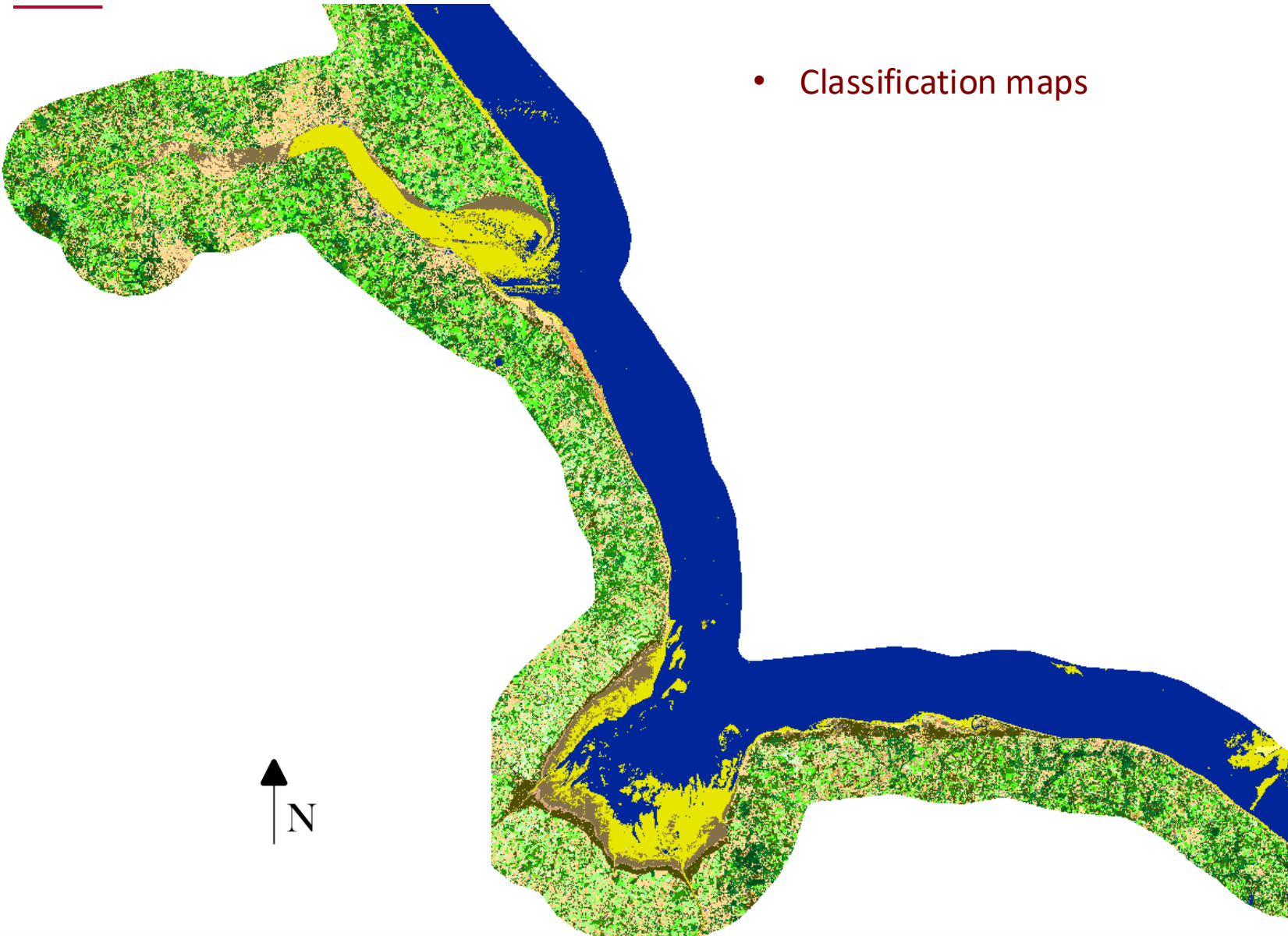


Time series



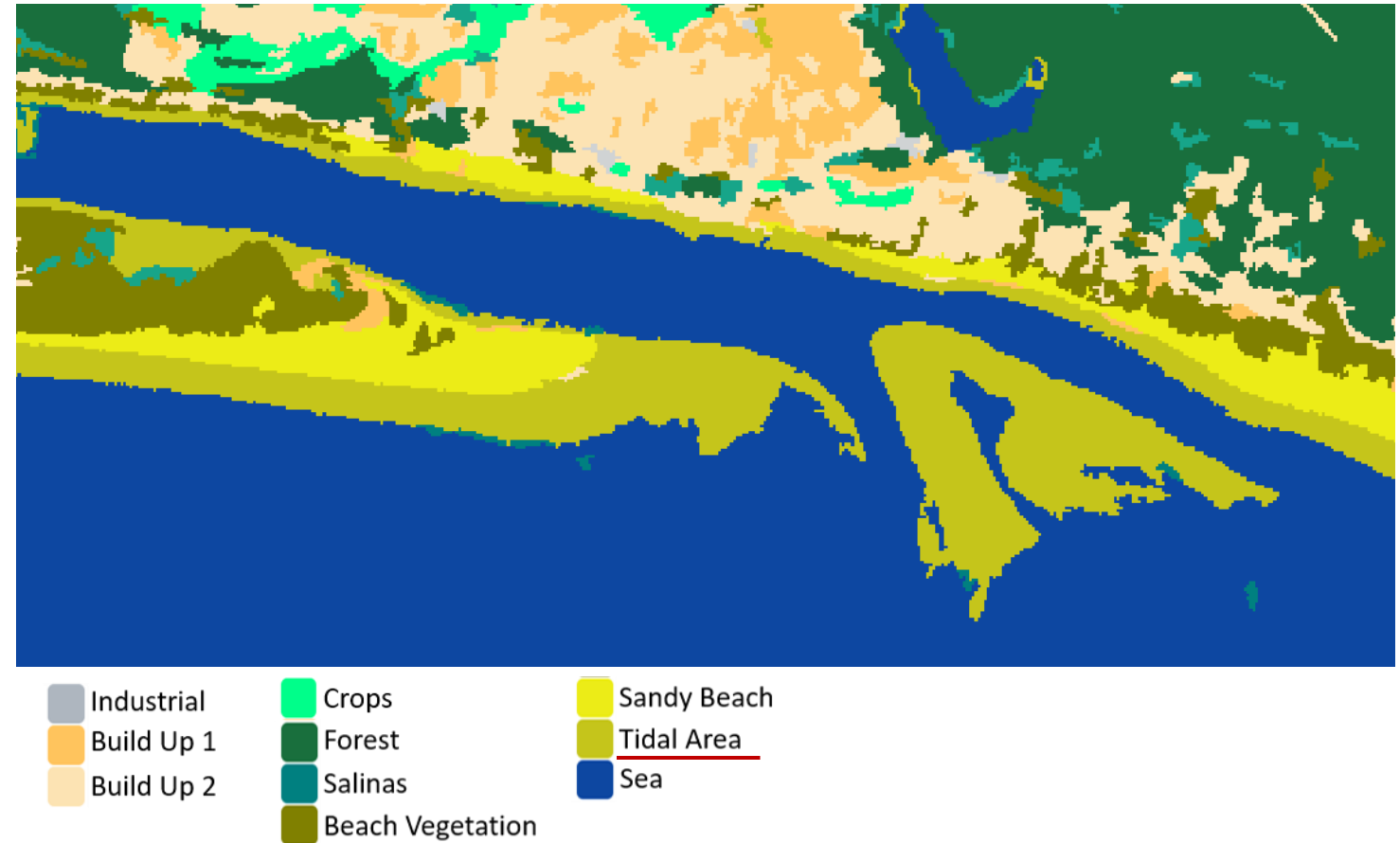
Additional products

- Classification maps



Additional products

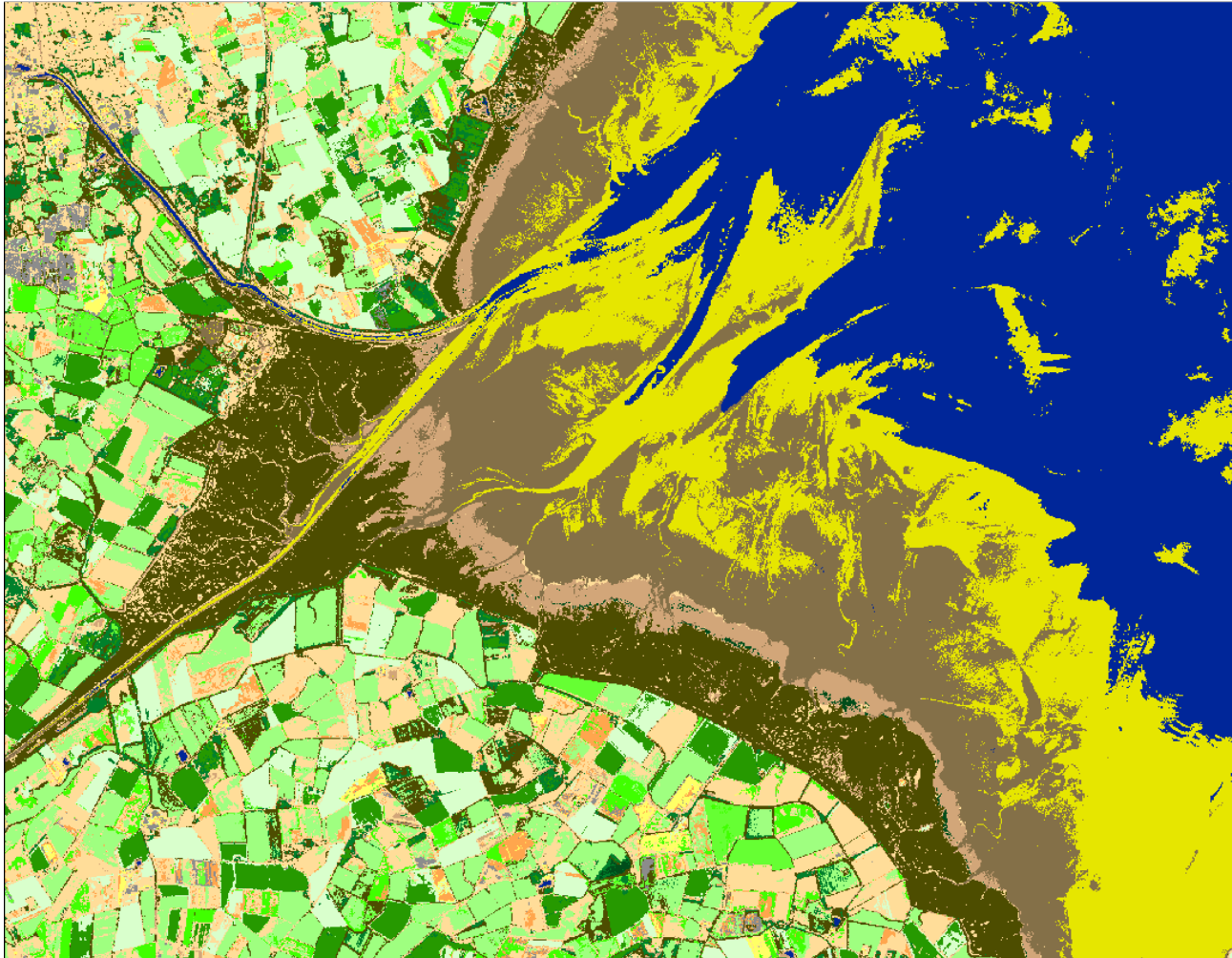
- Classification maps – moving coastal features



Additional products

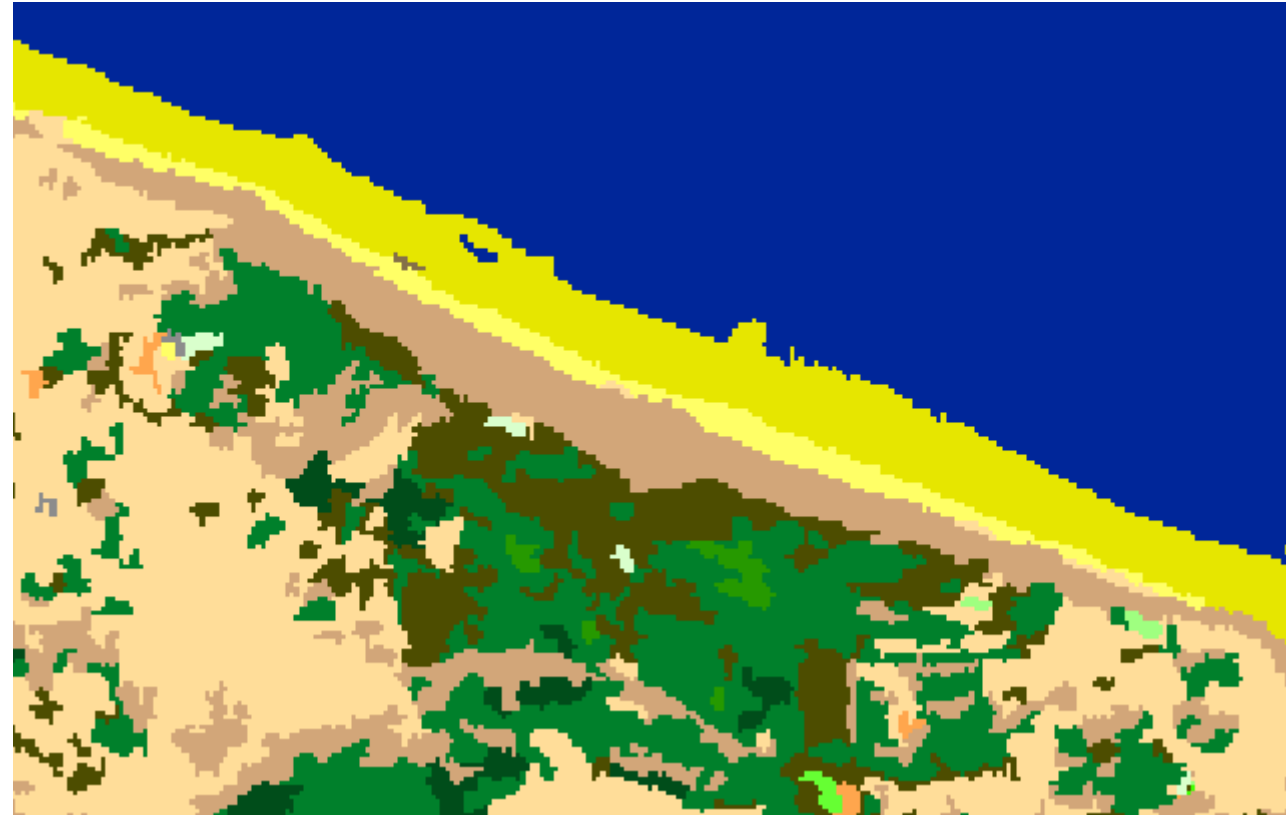
- Classification maps – moving coastal features

Industrial
Build-Up area 1
Build-Up area 2
Crop type 1
Crop type 2
Crop type 4
Crop type 5
Crop type 6
Forest type 1
Forest type 2
Soft Cliff
Salt Marshes
Mudflat
Sandy Beach
Tidal area
Sea



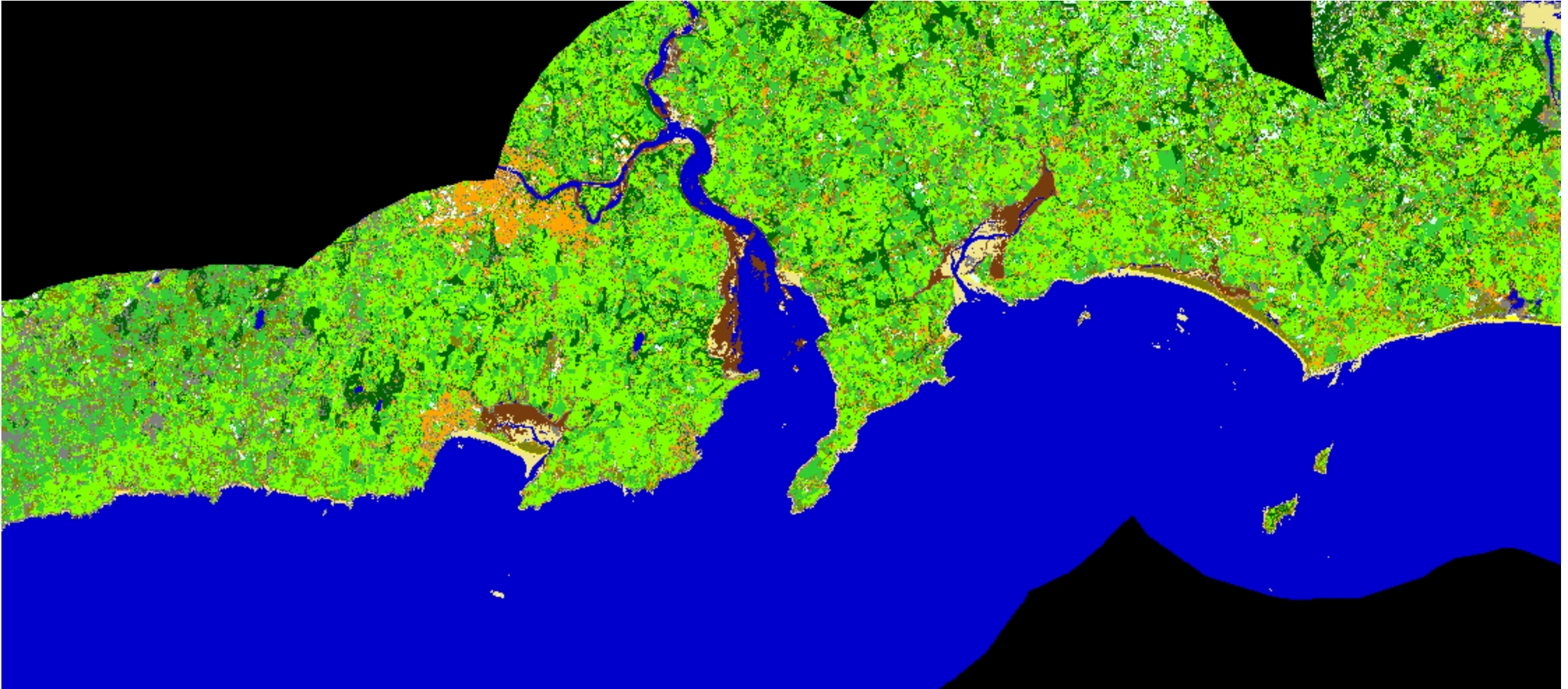
Additional products

- Classification maps – coastal areas



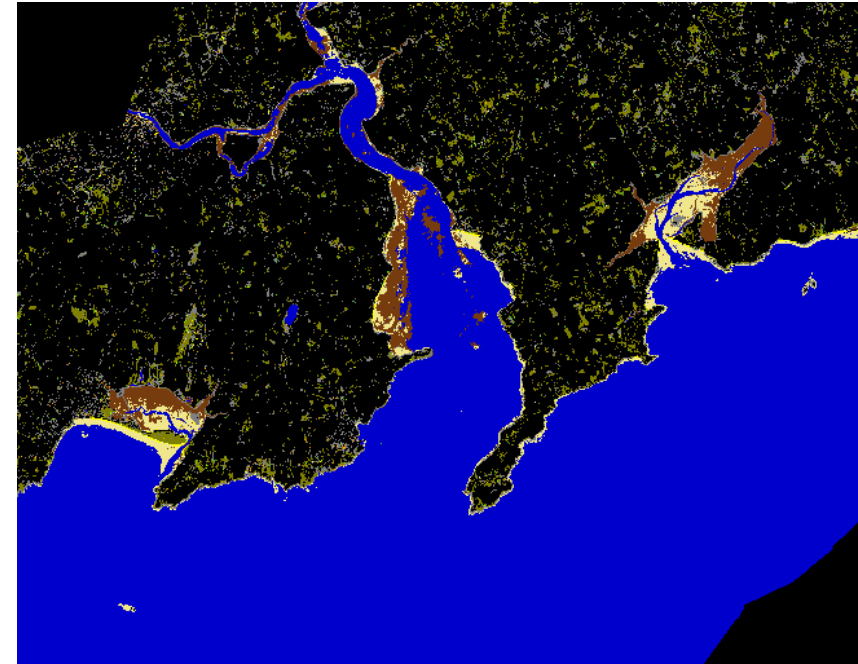
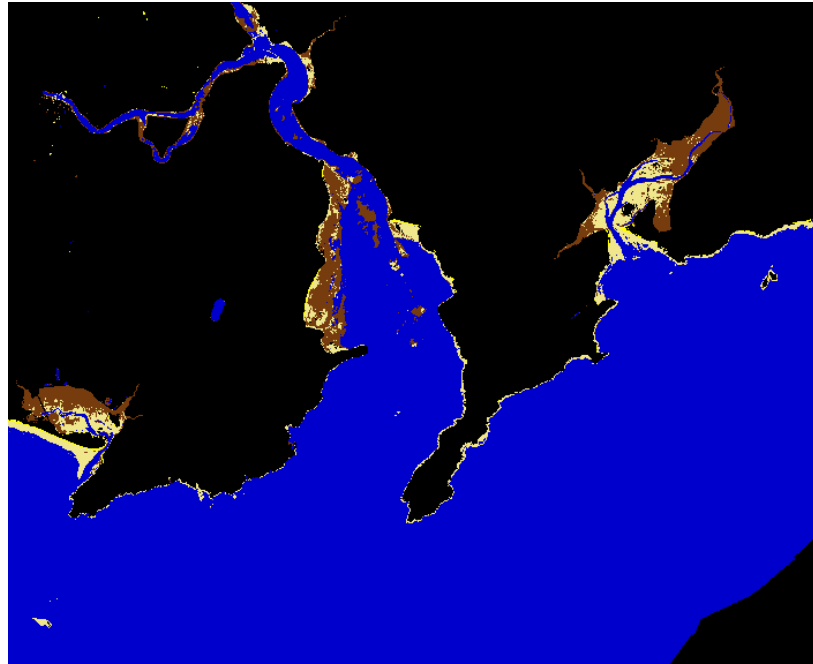
Additional products

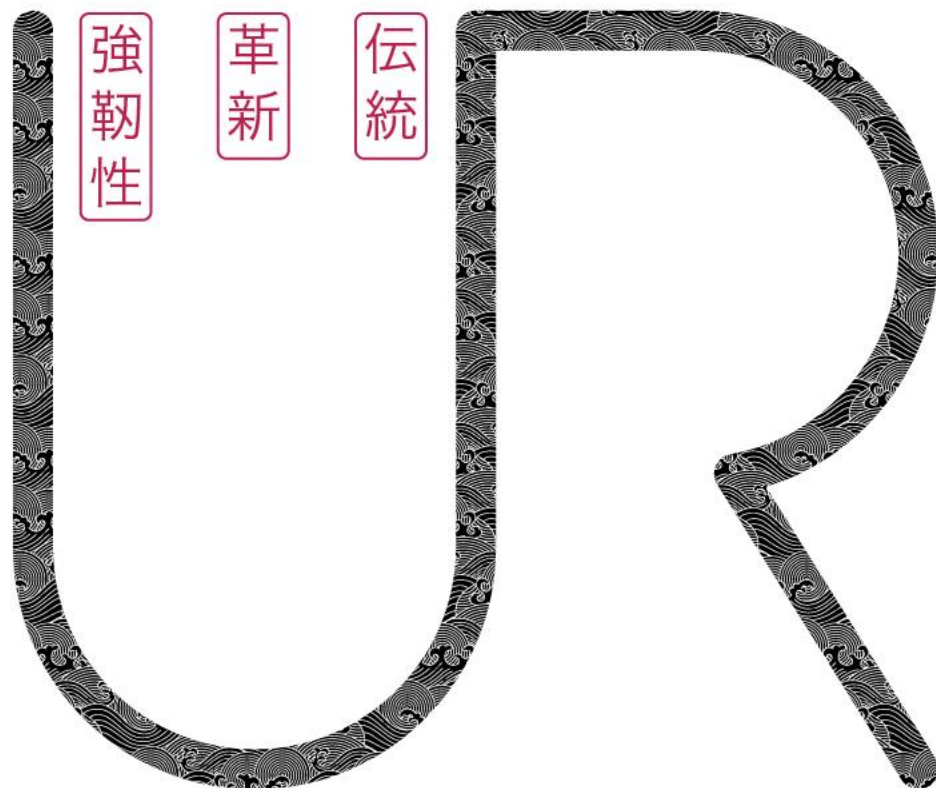
- Classification maps – coastal areas



Additional products

- Classification maps – coastal areas





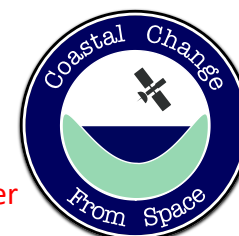
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Thank you !

Question ?

Anne-Laure BECK

EO Engineer &
Coastal Program Technical Manager



<https://coastalerosion.argans.co.uk/>

Logos:

