

Il monitoraggio della fascia costiera: **Linea di Costa Italiana 2020**



Coastal Change from Space

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ISPRA

Istituto Superiore per la Protezione
e la Ricerca Ambientale



**Sistema Nazionale
per la Protezione
dell'Ambiente**



The Coastal Erosion project



- ESA funded project
- 25 years of analysis
- 5 countries engaged
- Coastal indicators

Funded by the Science for Society slice of the 5th Earth Observation Envelope Programme overseen by ESA/ESRIN the Coastal erosion project commenced 3 April 2019. The scope of the project is the development and demonstration of innovative EO products to monitor coastal change.



More investment in coastal margins as populations grow and urbanization increase added to increasing severe storm events is a reality.



Looking for Innovative EO solutions



CE Consortium



British
Geological
Survey



ISPRA
Italian National Institute
for Environmental
Protection and Research



Satellite data

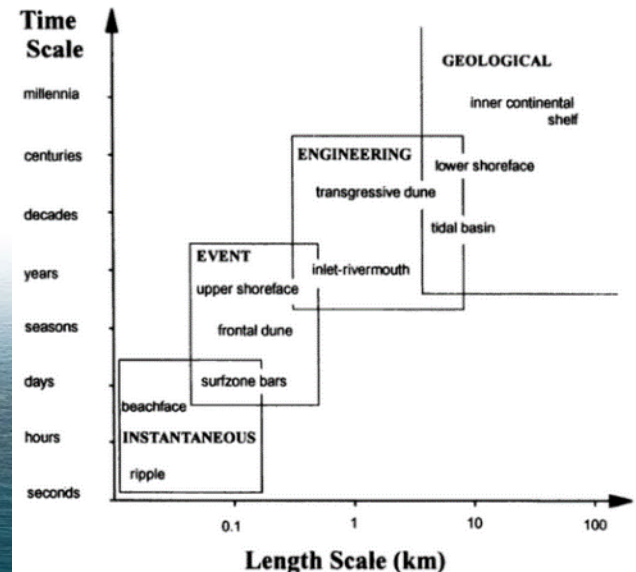
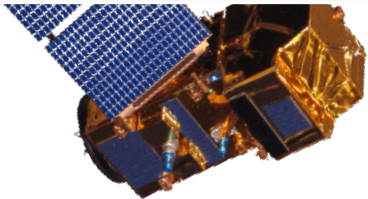
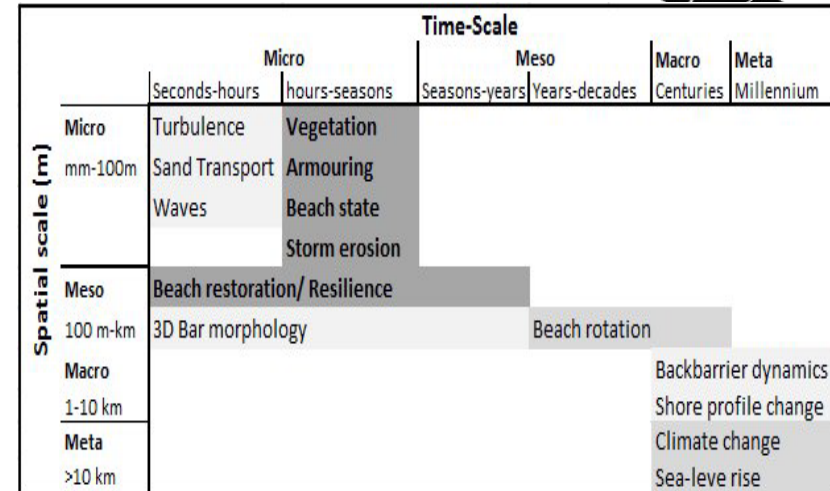
Mission	Number of Satellite	Dates	Revisit time
Sentinel-1	Sentinel-1 A Sentinel-1 B	2014 – 2016 –	6 days
Sentinel-2	Sentinel-2 A Sentinel-2 B	2015 – 2017 –	5 days
Landsat-8		2013 –	16 days
Landsat-5		1984 – 2013	16 days





Satellite data – Temporal resolution

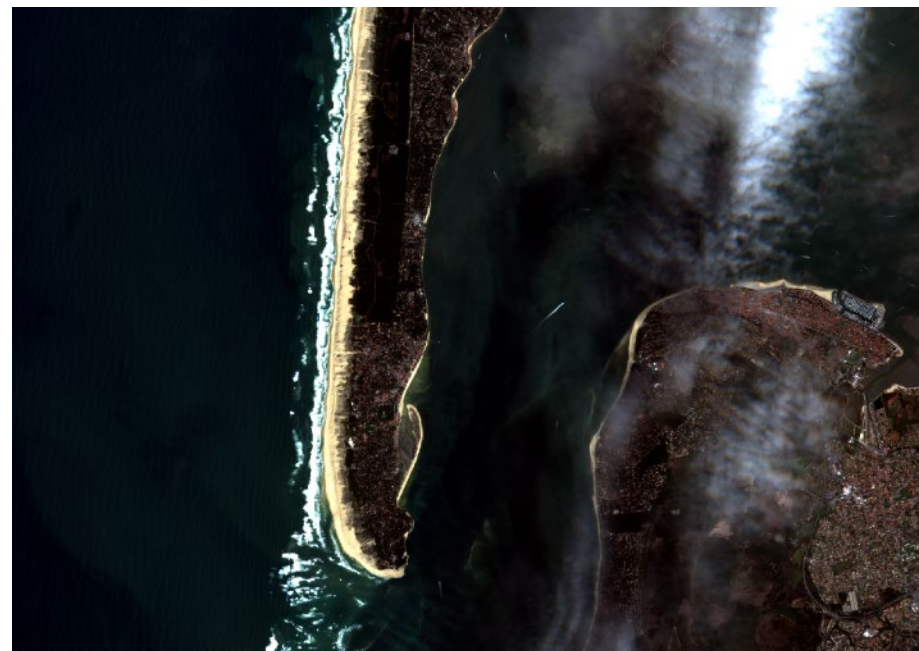
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Satellite data – Spatial accuracy



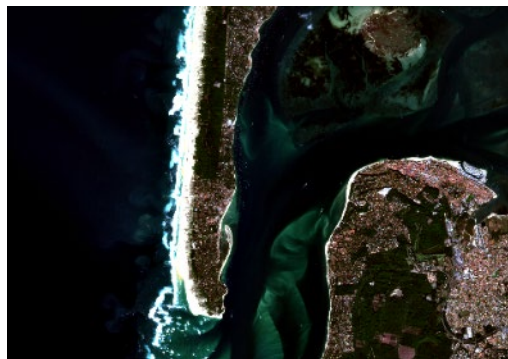
16/10/2018



15/03/2018



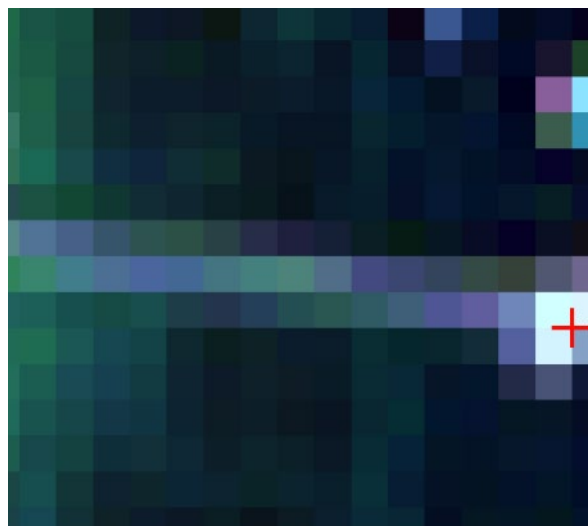
Satellite data – Spatial accuracy



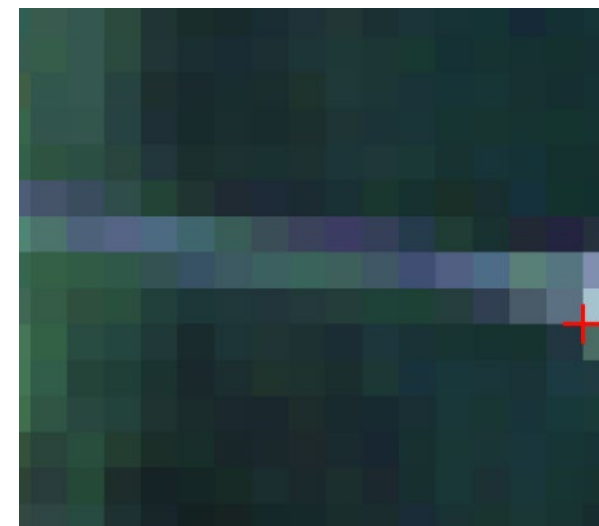
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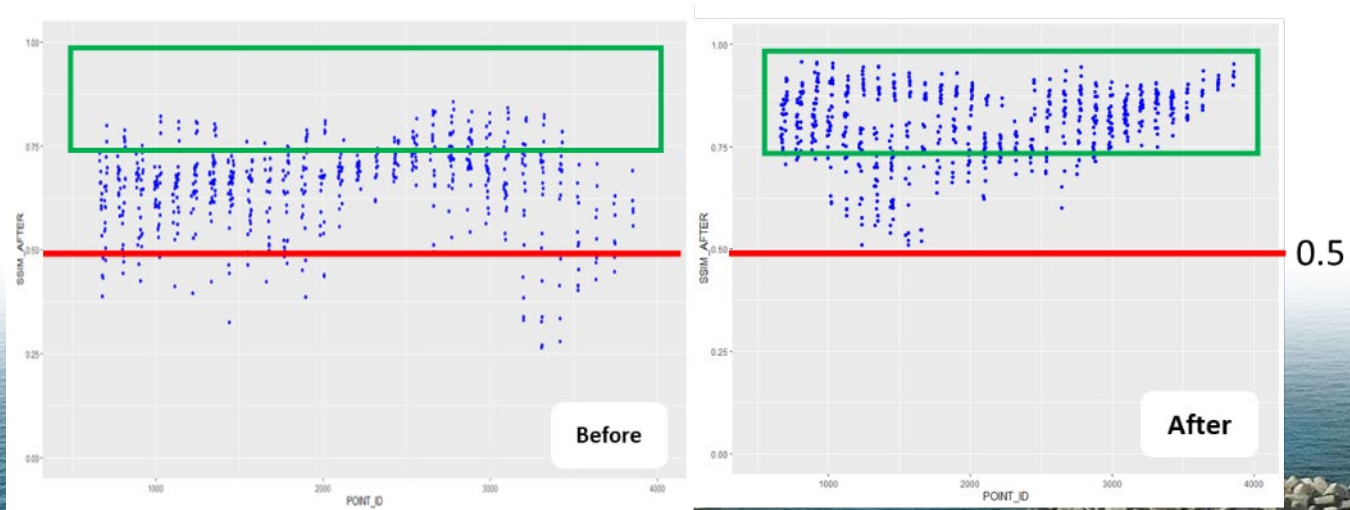
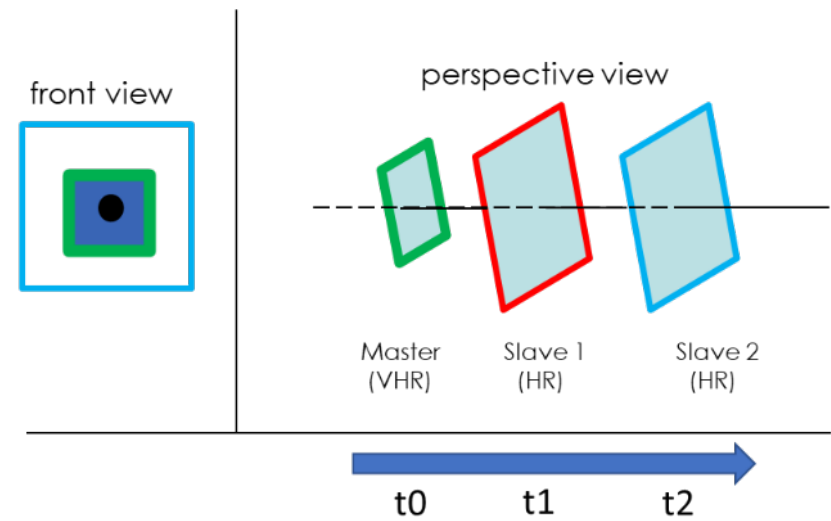
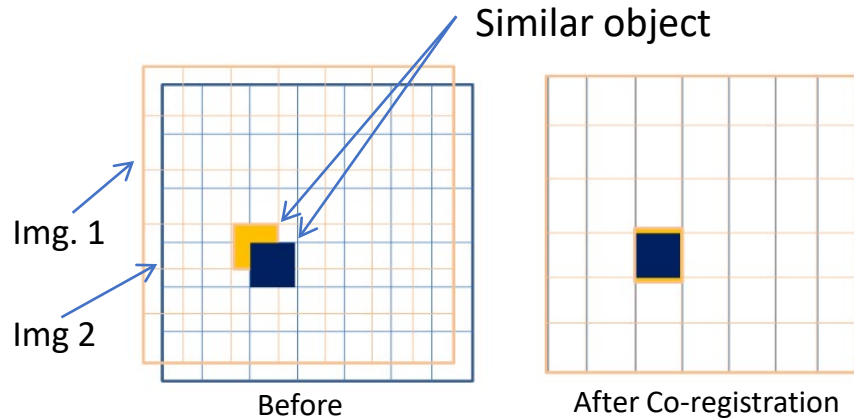
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16/10/2018



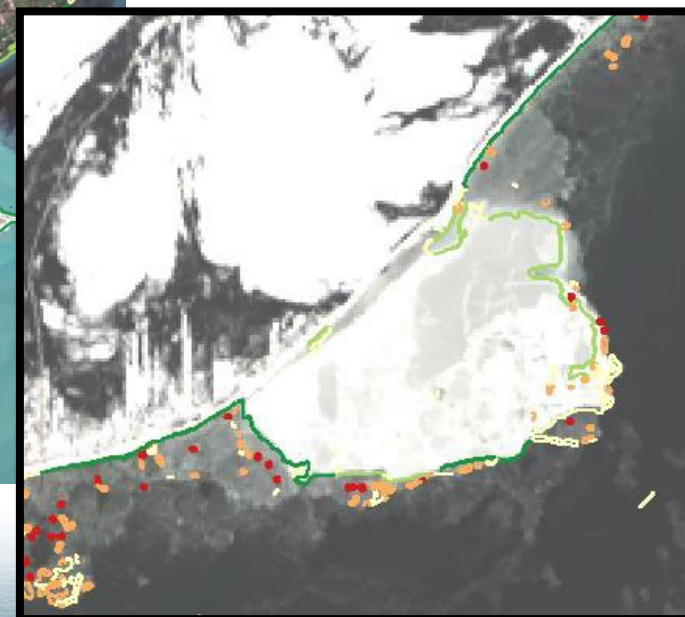
Our approach – Co-registration



Our approach – Waterline



Our approach – Waterline

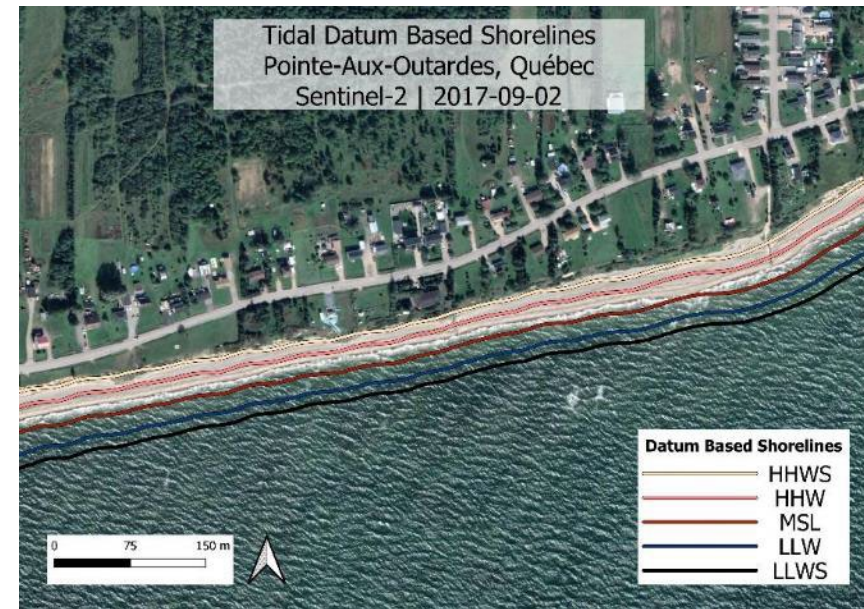
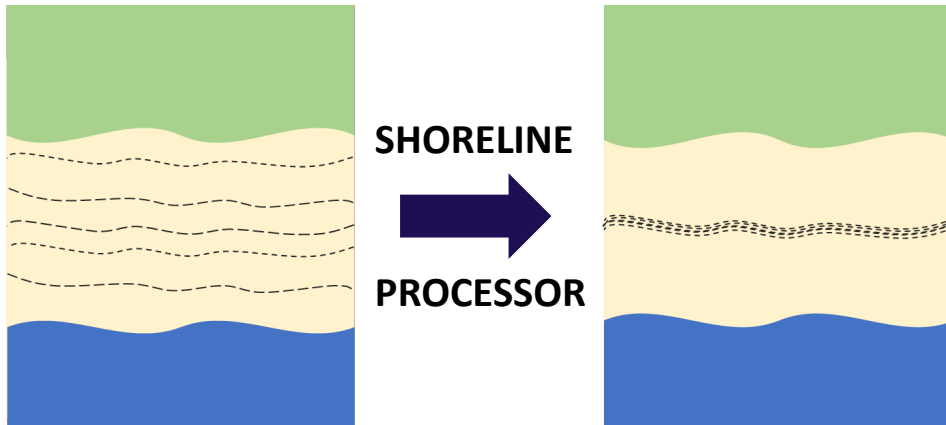


Our approach – Shoreline

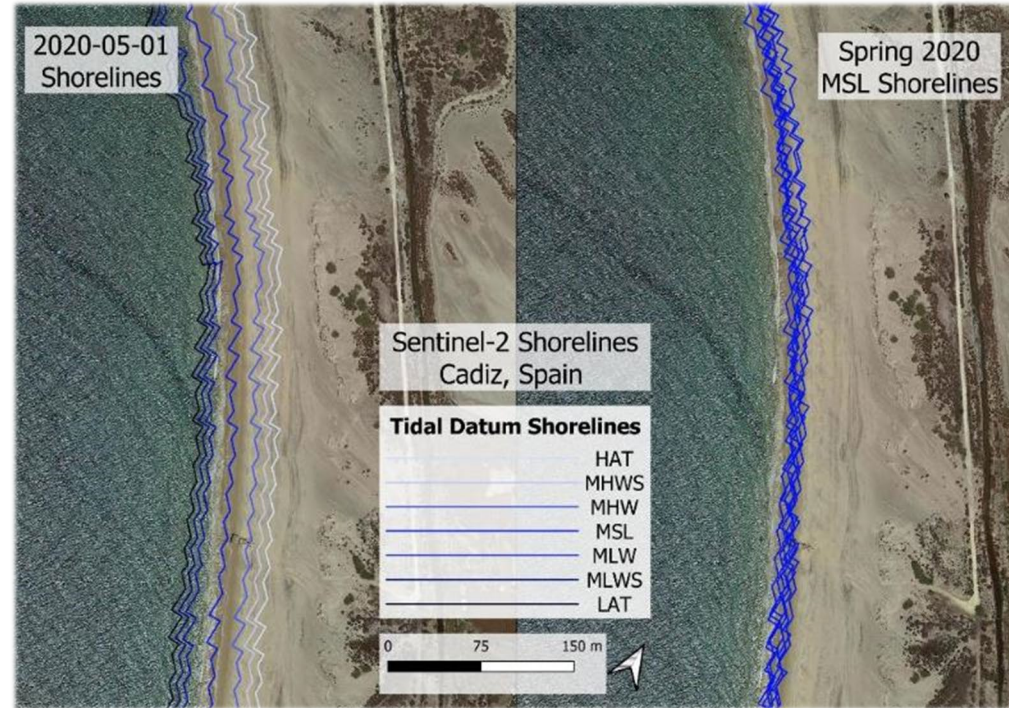
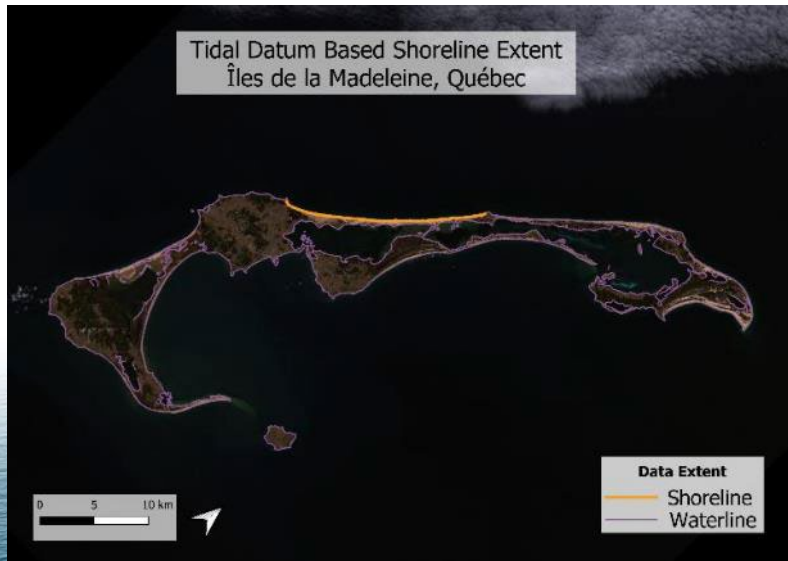
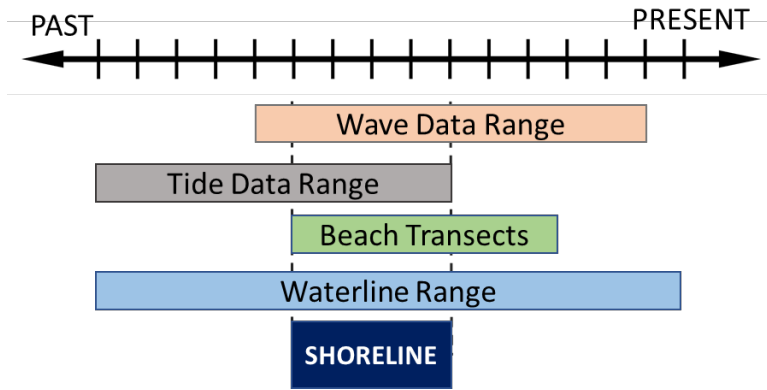
Waterline: a **dynamic** water level

Shoreline: a **fixed** water level

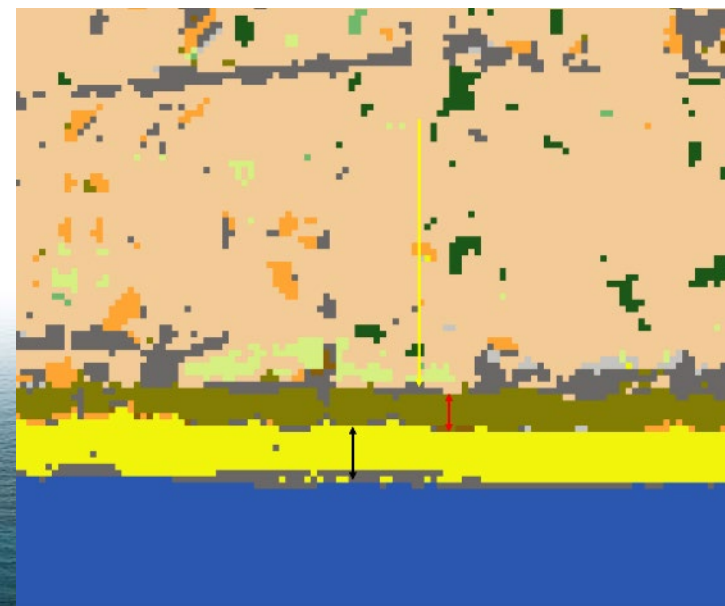
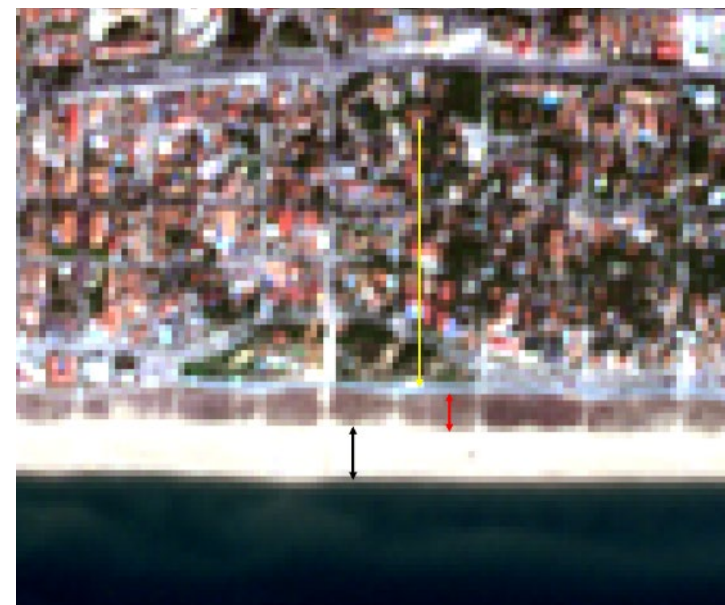
*Where would this waterline be positioned,
if the tide was say, at MSL?*



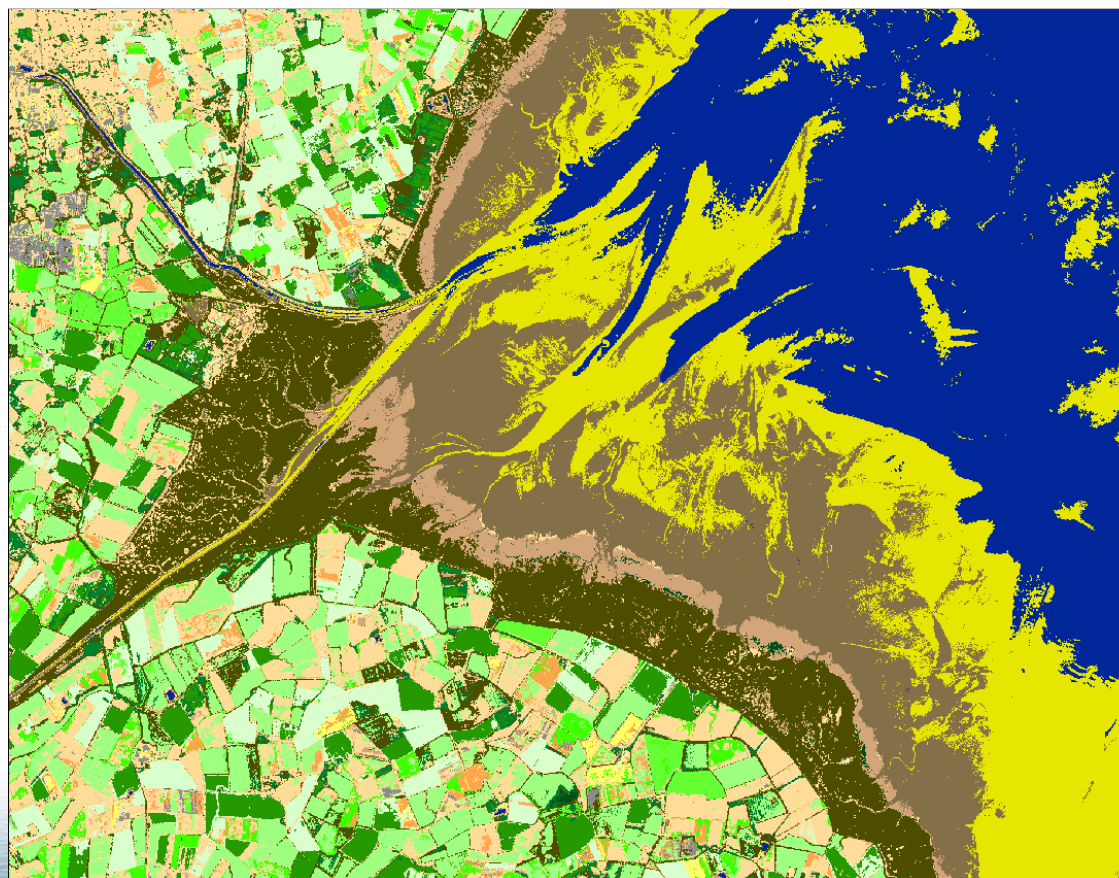
Our approach – Shoreline



















Our approach – Land cover map



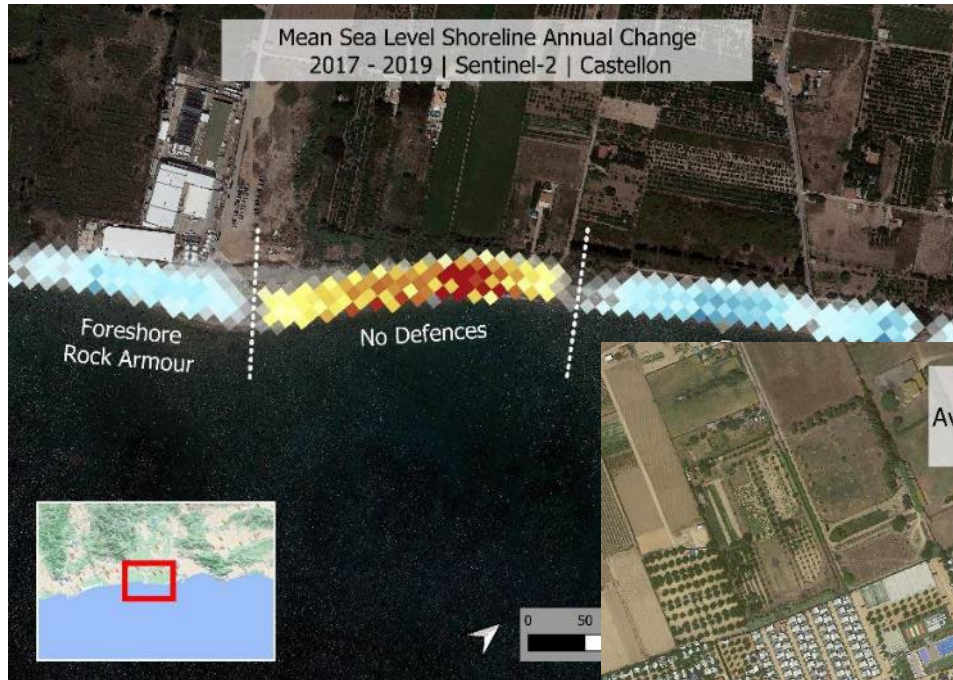
Our approach – Land cover map



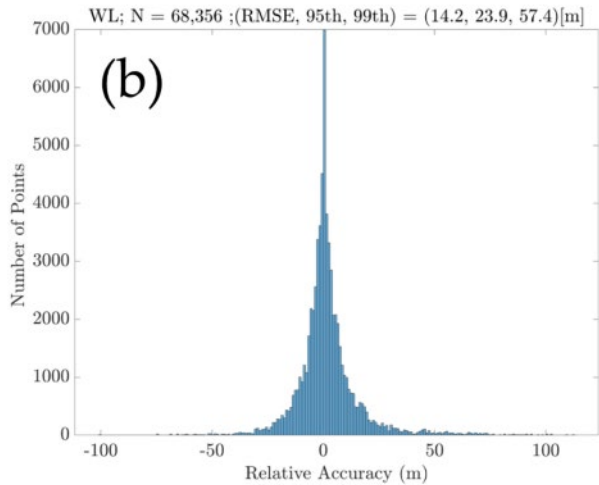
-  Industrial
-  Build-Up area 1
-  Build-Up area 2
-  Crop type 1
-  Crop type 2
-  Crop type 4
-  Crop type 5
-  Crop type 6
-  Forest type 1
-  Forest type 2
-  Soft Cliff
-  Salt Marshes
-  Mudflat
-  Sandy Beach
-  Tidal area
-  Sea



Our approach – Time series



Validation



- HWM
 - Non Foreshore Points
 - Closest point along waterline
- WL Confidence Level
- 12 - 41
 - 41 - 71
 - 71 - 100

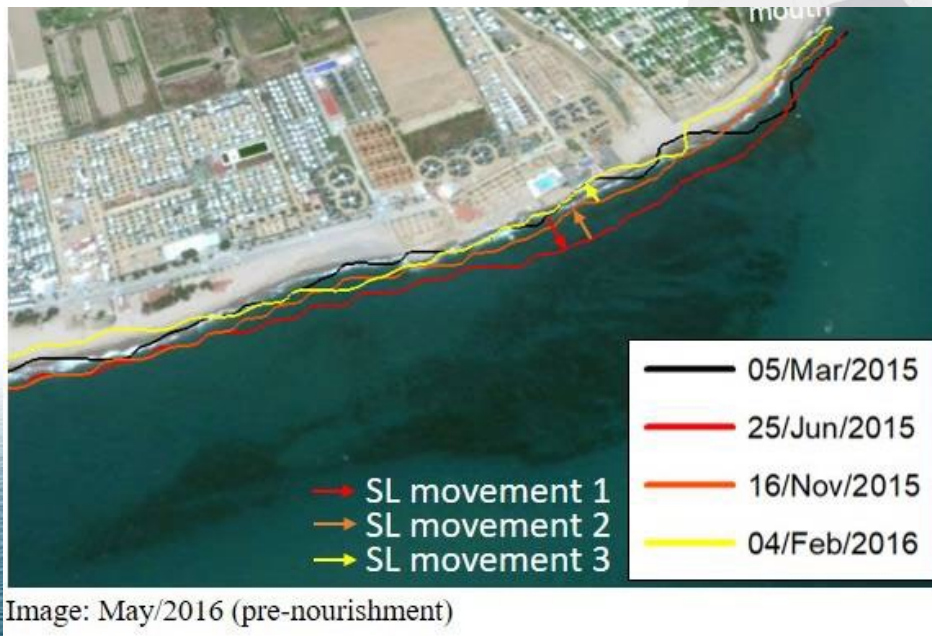
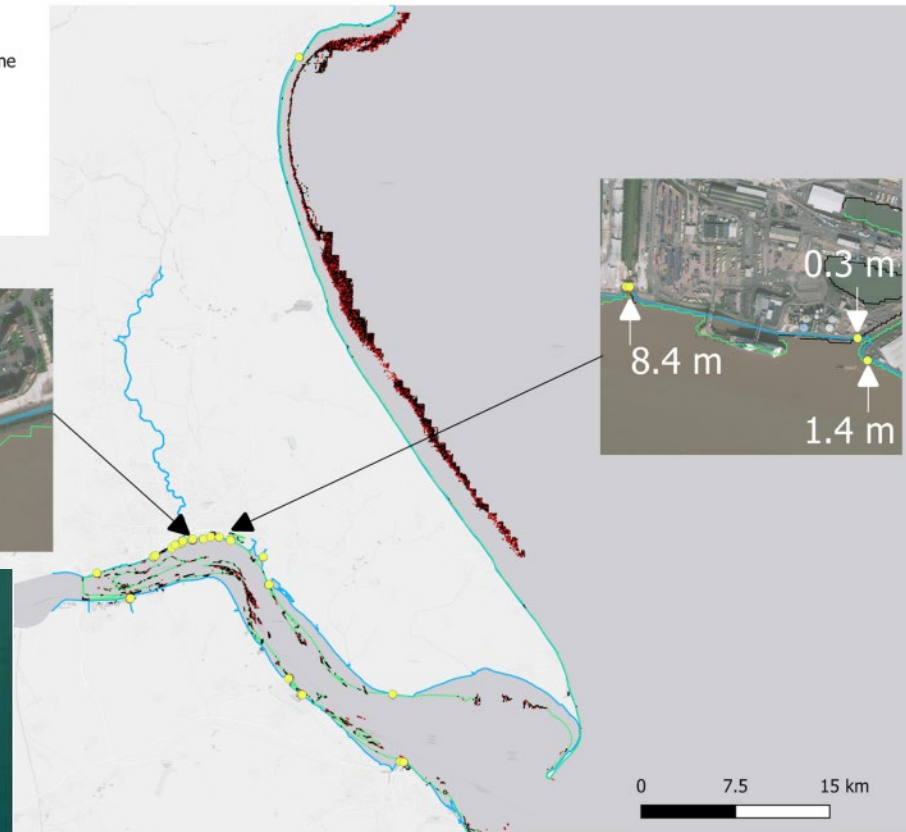
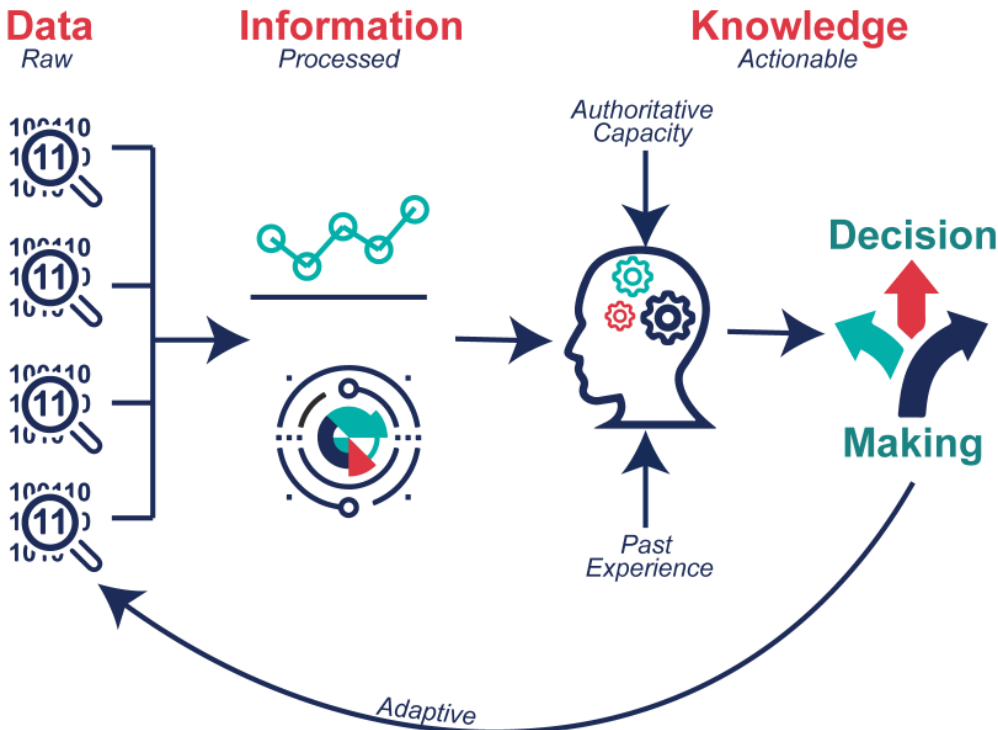


Image: May/2016 (pre-nourishment)



Risks Management

How information derived from the EO products can be used to coastal risk management



	Data	Information
EO products		Conversion of WL and SL into change rate information that are suitable for decision makers.
Geo Data		Combination of EO products and geospatial data to produce progression of risk maps.

Enriched Coastal Vulnerability data bases



Application



1998



2021



Application

1998

2021



Application

1998



2021



What's next ?












OCRE EO Catalogue
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OCRE Earth Observation Catalogue

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Service type

 Sentinel Hub	 Data analytics	 Collaborative Earth Science Services Ellip Studio Solution
 Mundi Web Services	 EO data processing	 Rheticus @ Safeland
 EarthConsole®	 Coastal Erosion services	 detect more. Shoreline Mapping





Thank you for your attention

Contact

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Web site

coastalerosion.argans.co.uk

