



Inspire

coastal challenges



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European Pavilion

Digital Ocean

Nice | France
2 - 13 JUNE 2025

Coastal Digital Twins:
powerful simulation tools
to replicate coastal
conditions and forecast
future scenarios

13/06/2025



Around the world the coastlines are breaking

- Communities Displaced
- Lives lost
- Economies disrupted
- Nature damaged

Now imagine a world where we can predict disasters and plan adaptation measures well ahead of time



1. Saving Lives

2. Protecting People from Displacement

3. Preserving & Developing Sustainable Blue Economies

4. Protecting Marine Life

What is the DTCO

Let's Make it Real with CMCC's DTCO

“Digital Twin of the Coastal Ocean”

Virtual Replica of Coastal & Marine Environments

Observes & Simulates Coastal Hazards

Supports Faster and Smarter Decisions

Reduces Risks & Builds Resilience

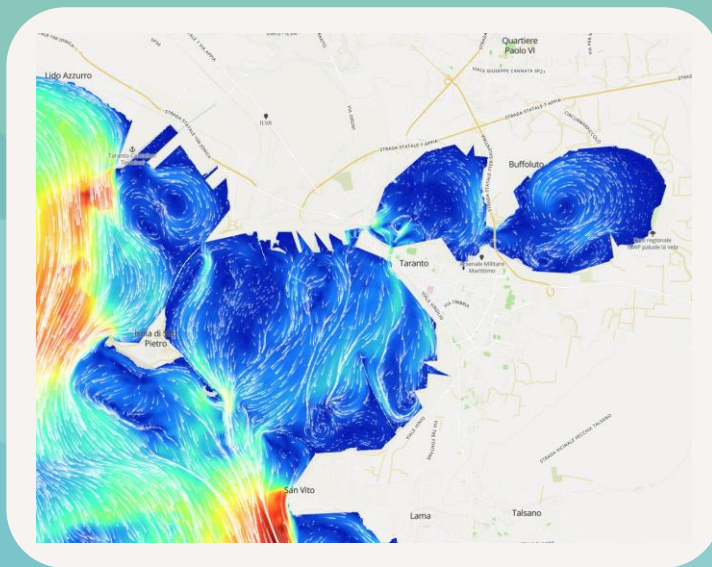


Science – The Engine of DTCO

DTCO uses real-time data, forecasting, and climate modelling to track hydrology, ocean conditions, and ecosystems, predicting local coastal risks and informing communities



Coastal Observing & Modelling Systems



Coastal Climate Downscaling



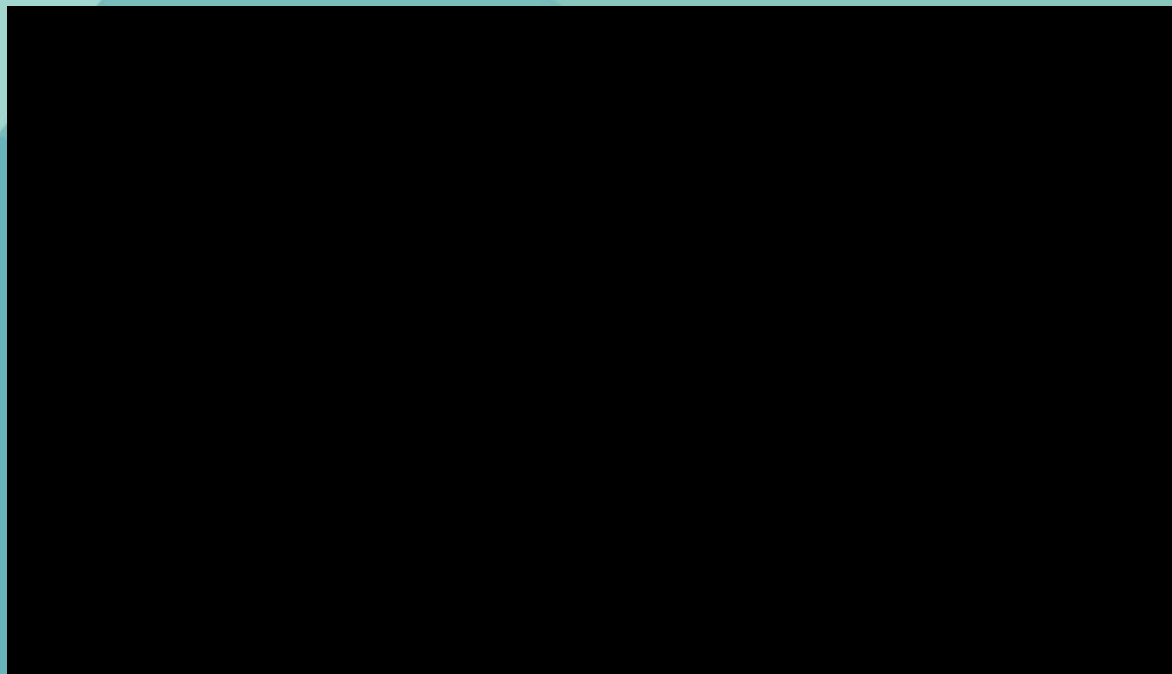
Knowledge Exchange & Engagement

Services – Turning Science into Action

1

“Early Warnings”

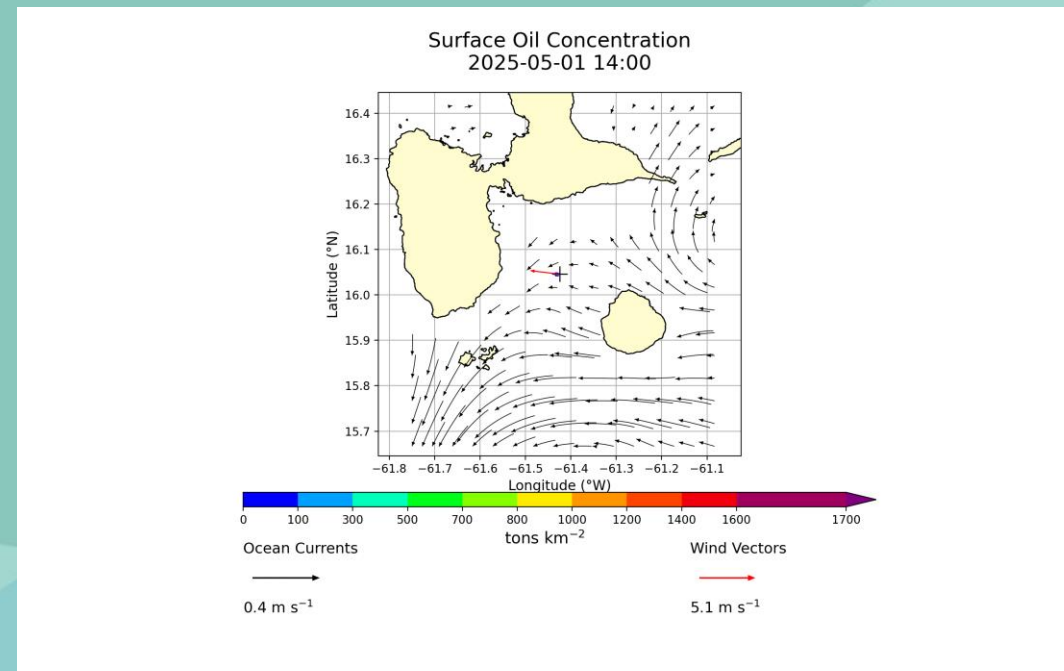
Storm Surge in Manfredonia (Italy)



2a

“Decision Support Tools”

Oil Spill Simulation Guadeloupe (Caribbean)

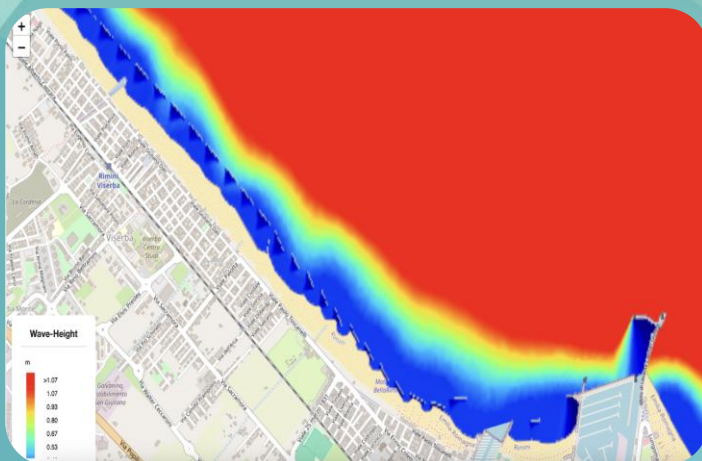


Services – Turning Science into Action

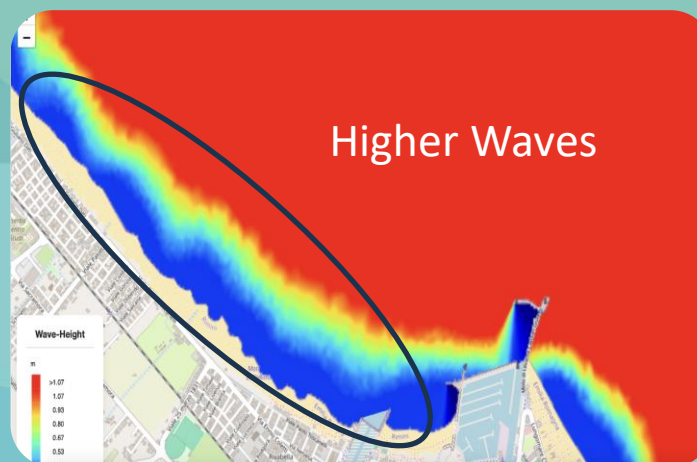
2b

“Decision Support Systems”

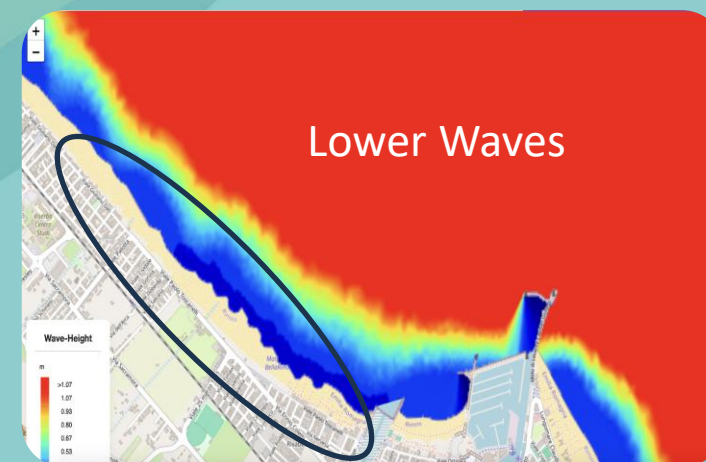
What if we substitute barriers with NBS?
Rimini (Italy) Coastline Planning



Present
situation With
Barriers

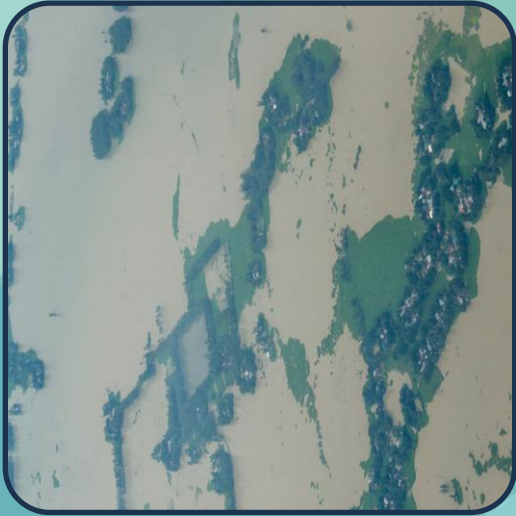


WIS Without
Barriers



With NBS
Nature Based Solutions
(Sea Grass Meadows)

Bangladesh – Navigating the Edge



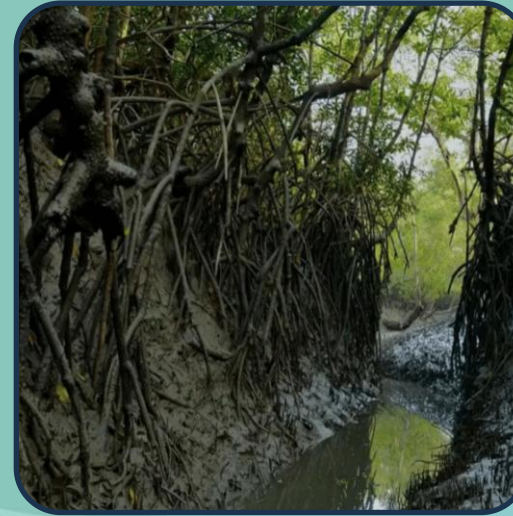
Cyclones affect 2.8M people

DTCO early warning system
sends alert to save lives



Floods caused 41,000 deaths

DTCO informs measures
to mitigate impacts



Mangroves fell 64%

DTCO helps planning
smart restoration



\$5.5M spent for mitigation

DTCO optimises interventions
to lower costs and boost
returns

CoastPredict GlobalCoast Network



UN's CoastPredict GlobalCoast Partnership

130+ Pilot Sites Already Engaged

225 Institutes in 65 Countries





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Let's Build Resilient Coastal Communities Together!

