MARETEC
MARINE, ENVIRONMENT AND TECHNOLOGY CENTER
TÉCNICO LISBOA

Interreg Atlantic Area

Co-funded by the European Union

PLAST4H2

Lagrangian simulation of plastic transport and accumulation zones around the Bay of Biscay

using Mohid Lagrangian

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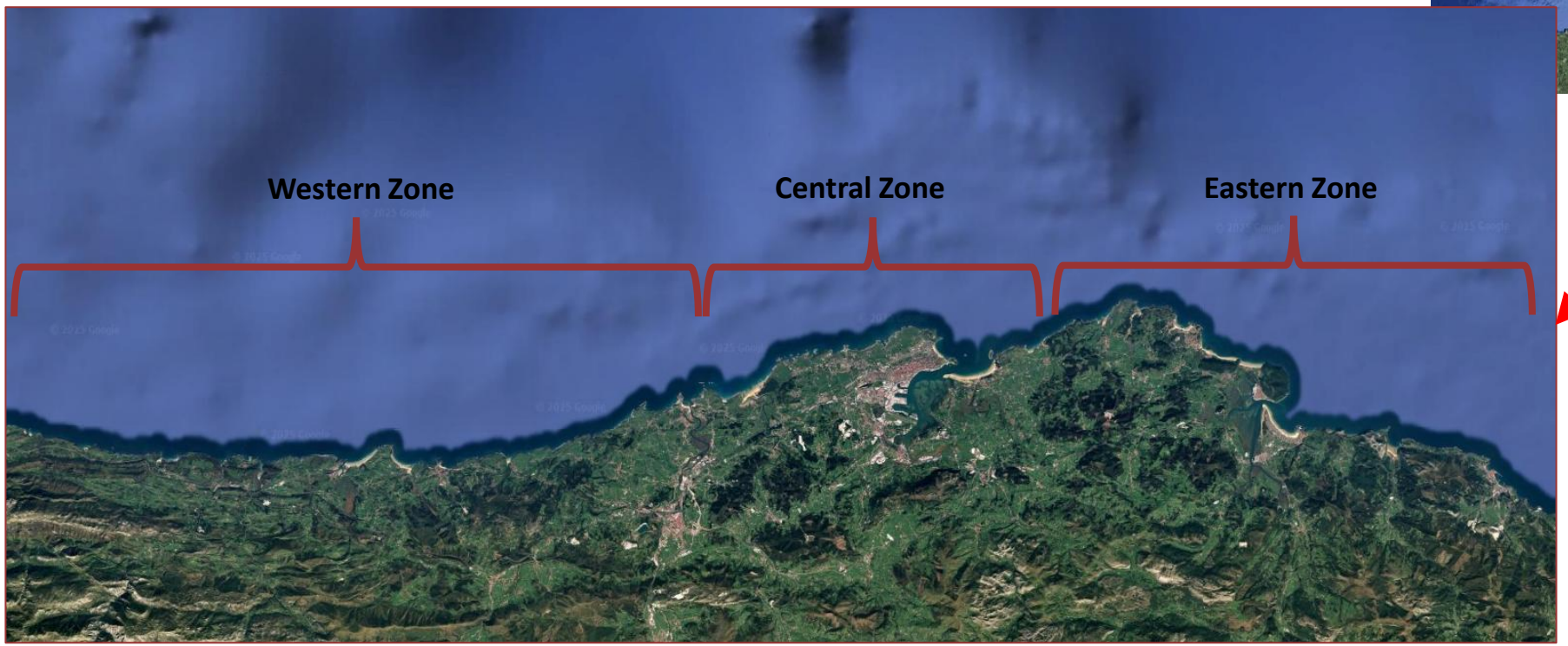
PLAST4H2

Project “PLAST4H2”

- Detect floating plastics via a mobile app
- Model plastic dispersion in the Atlantic → Using MOHID Lagrangian
- Conduct underwater and beach clean-ups
- Manage and valorize recovered plastics
- Convert plastics into hydrogen (pyrolysis & photocatalysis)
- Test hydrogen purification and fuel cell integration
- Explore conversion into ecoplastics

Bay of Biscay Study Case

Field Data



Bay of Biscay Study Case

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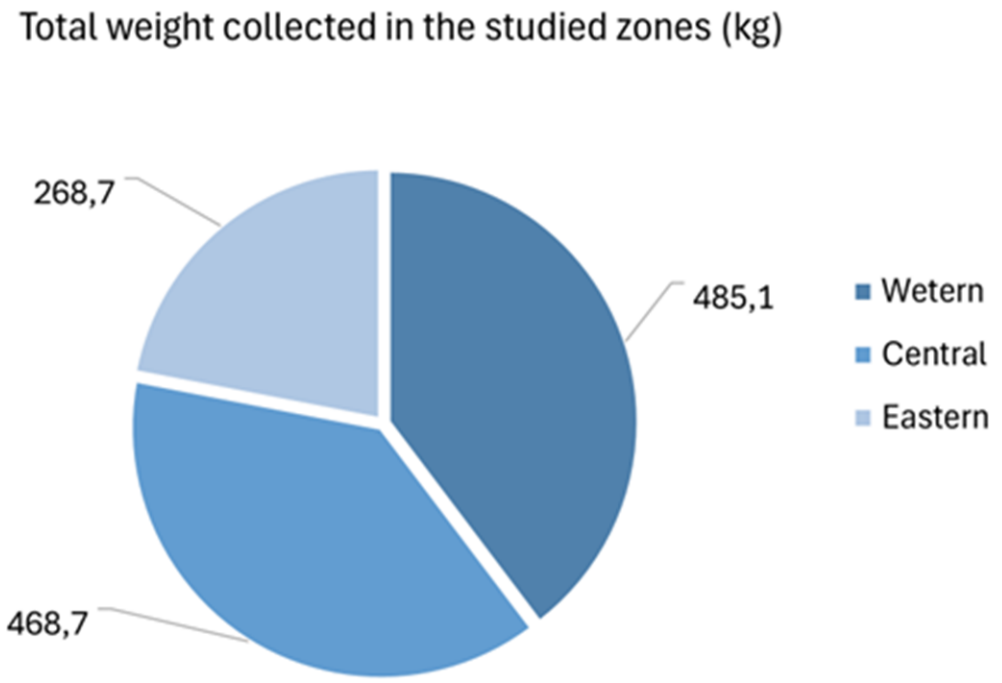


Figure 1: Total weight collected in the studied zones, in kilograms. Source: MARE

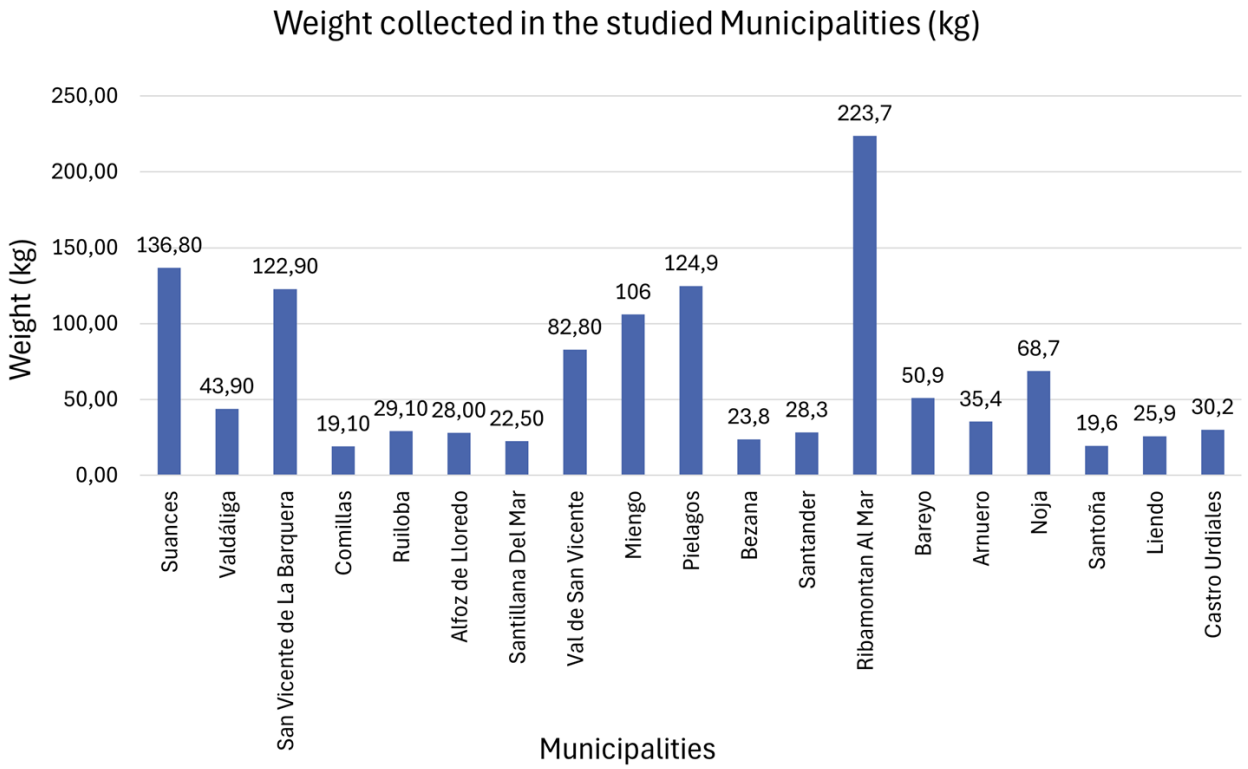


Figure 2: Weight collected in the studied municipalities, in kilograms. Source: MARE

Bay of Biscay Study Case

Field Data

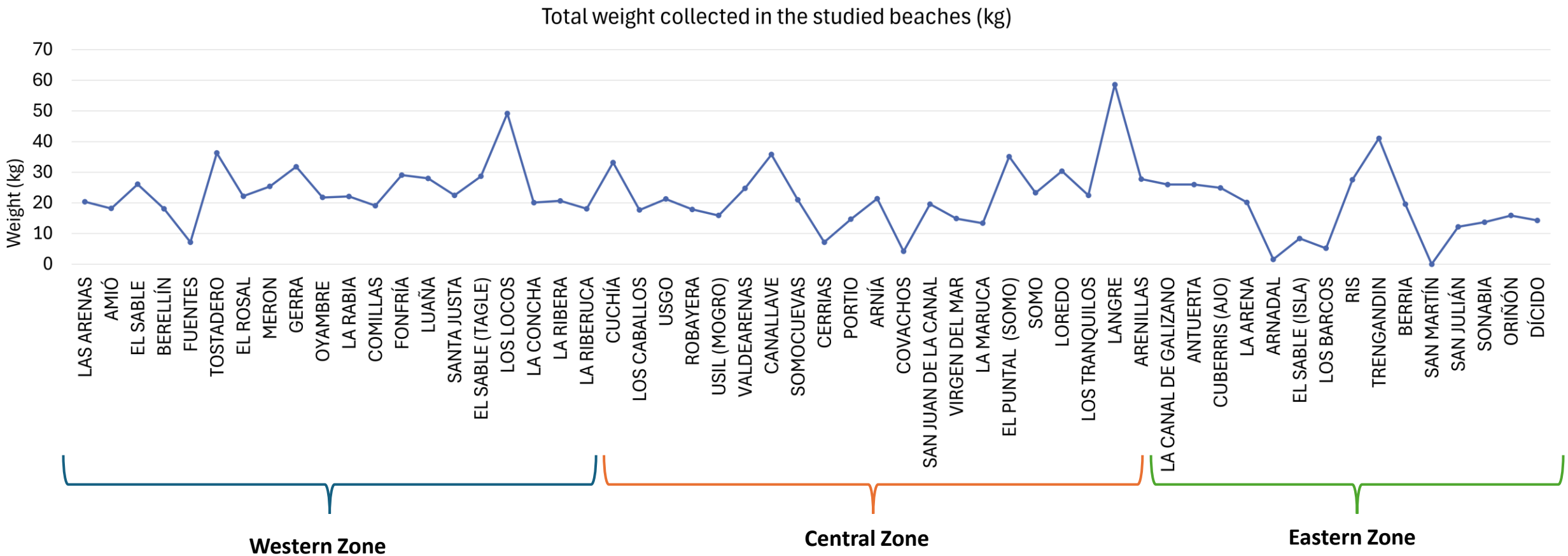


Figure 3: Total weight collected in the studied beaches, in kilograms. Source: MARE

Bay of Biscay Study Case

Hydrodynamic

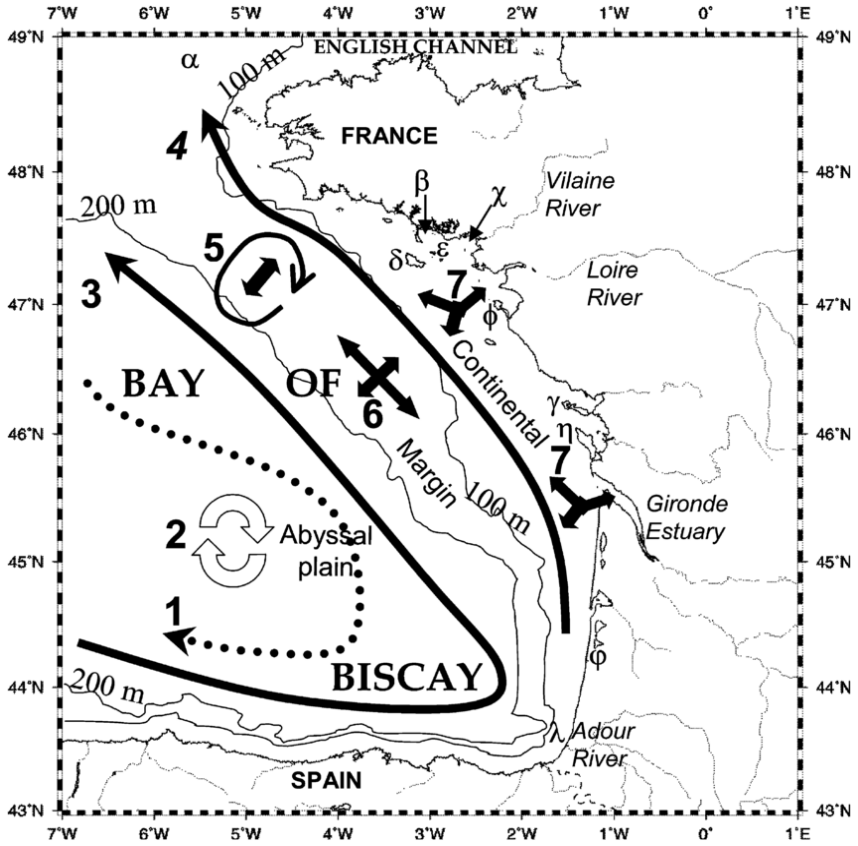


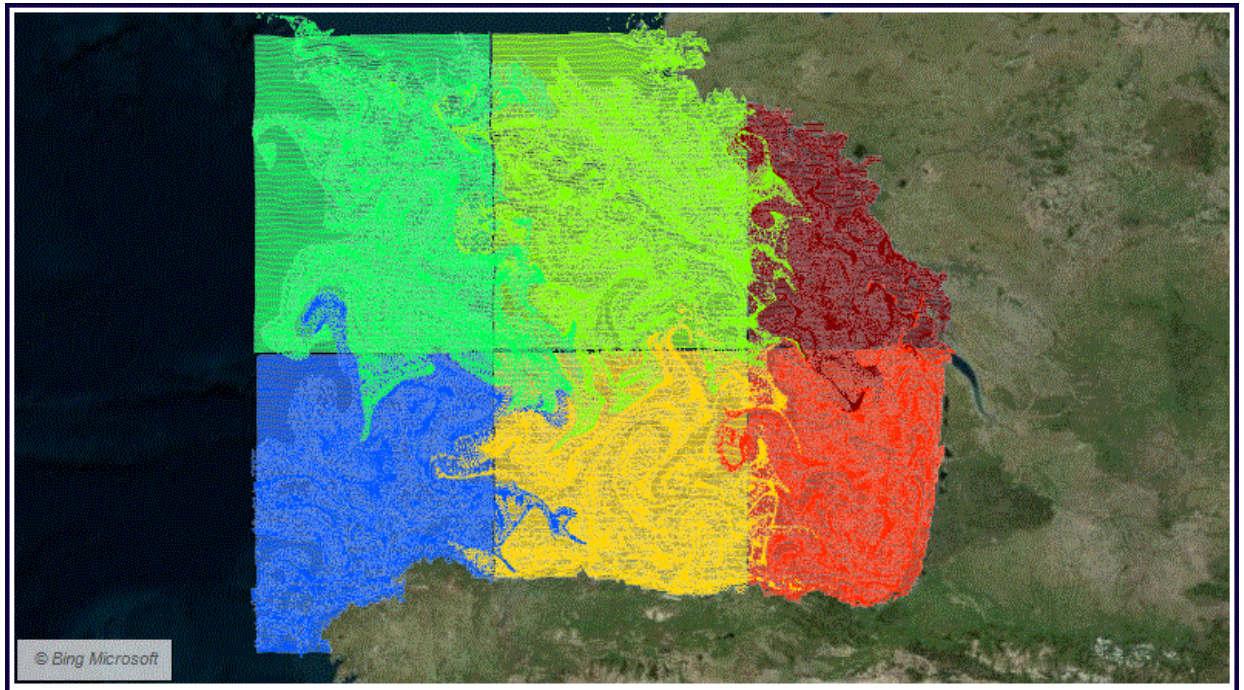
Figure 4: Hydrodynamic in the Bay of Biscay. Source: Druon, J. N., Loyer, S., & Gohin, F. (2005).

Hydrodynamics Seasonality	
Summer	**Winter**
IPC weakens	IPC strengthens
Anticyclonic Circulation develops	Cyclonic Circulation prevails
Weaker Vertical Mixing	Vertical mixing increases
Mesoscale Eddies and wind-driven currents	Slope Currents intensify

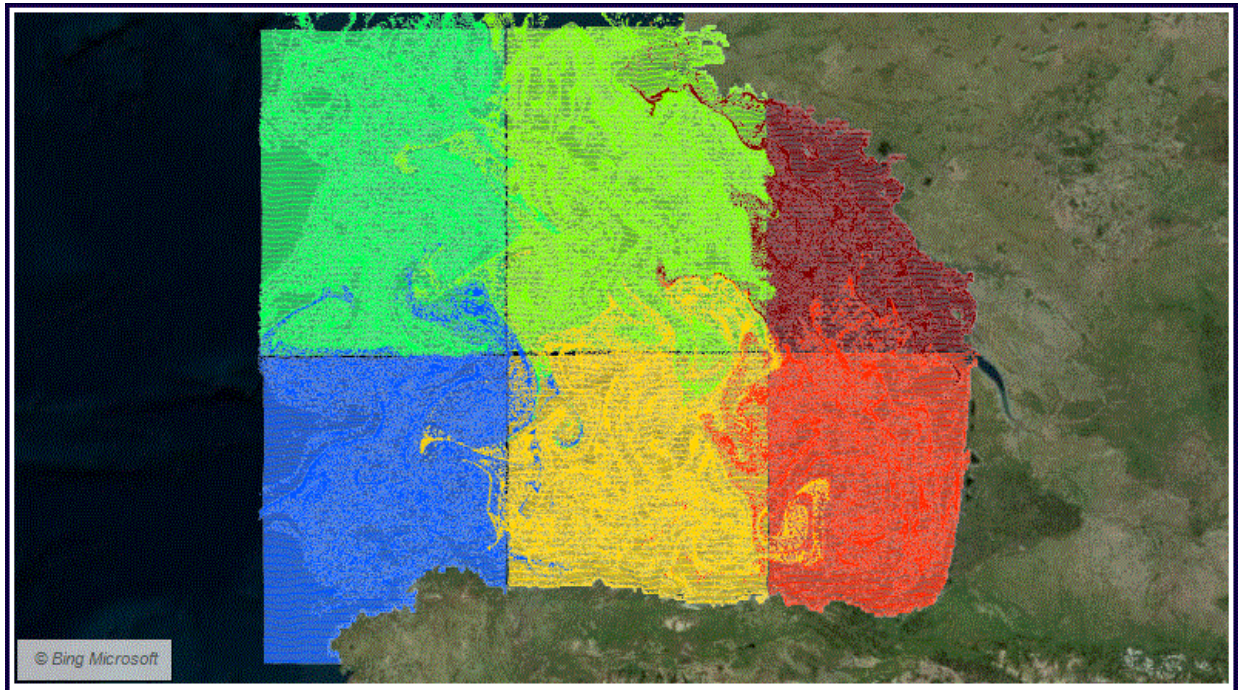
Table 1: Comparison of summer and winter seasons and their respective hydrodynamic characteristics in the Bay of Biscay

Bay of Biscay Study Case

Results



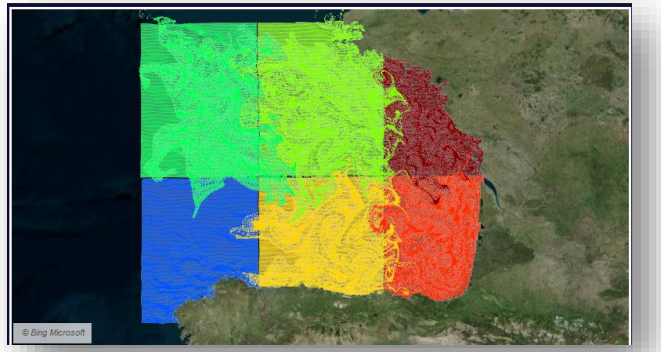
OpenFlows™ FLOOD™	Bay of Biscay - Winter 6 months simulation	00:30:00 01-10-2019

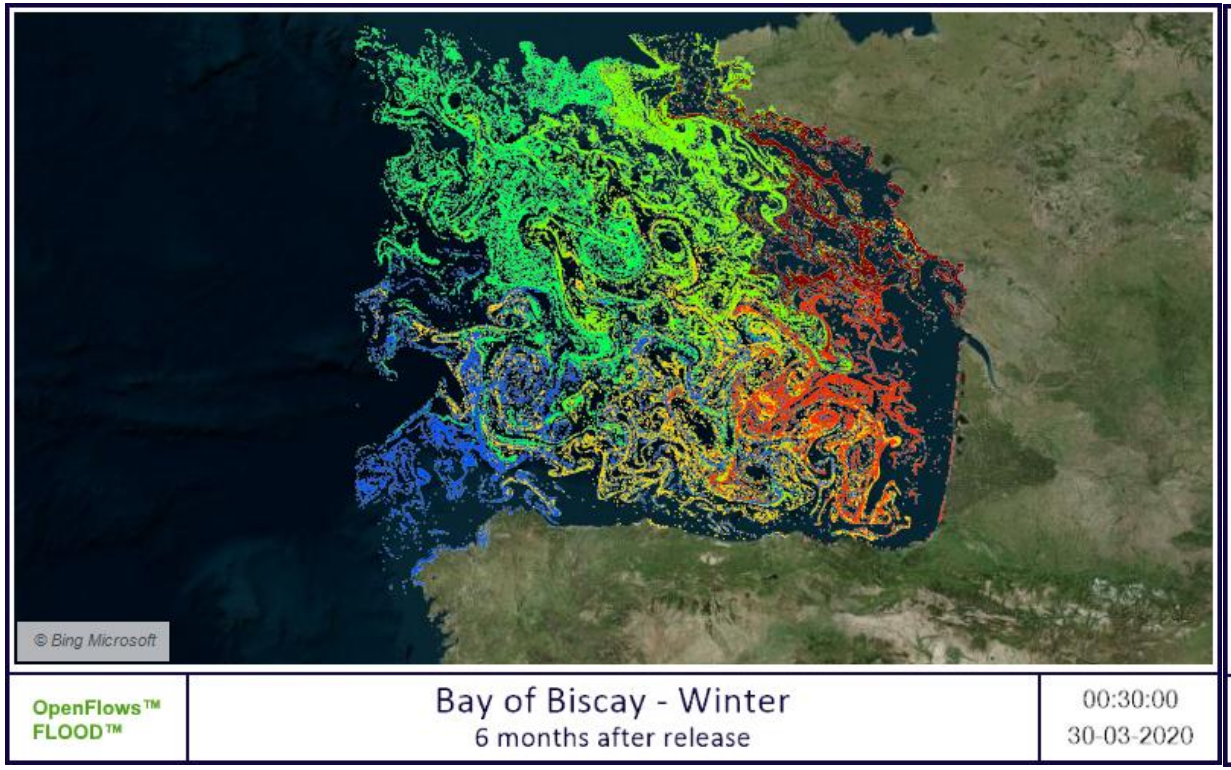


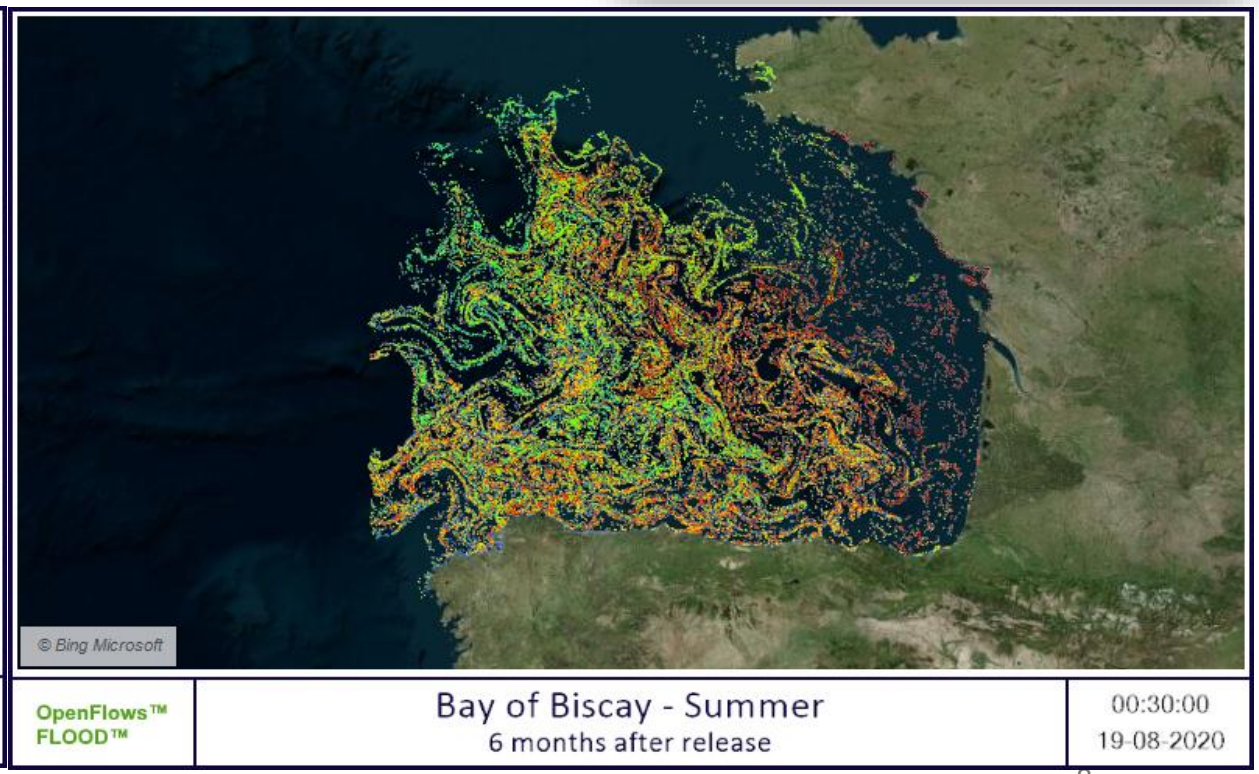
OpenFlows™ FLOOD™	Bay of Bicay - Summer 6 months Simulation	00:30:00 01-04-2020

Bay of Biscay Study Case

Results

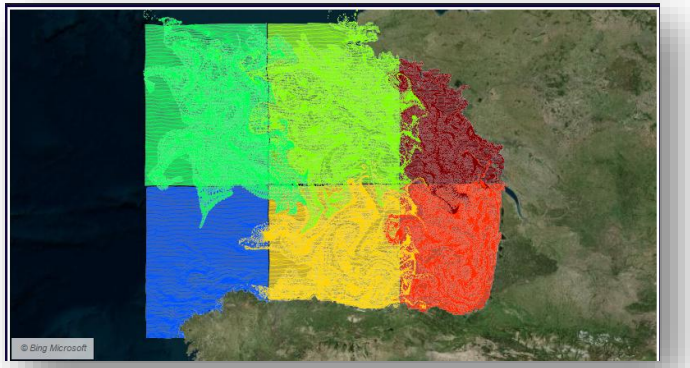


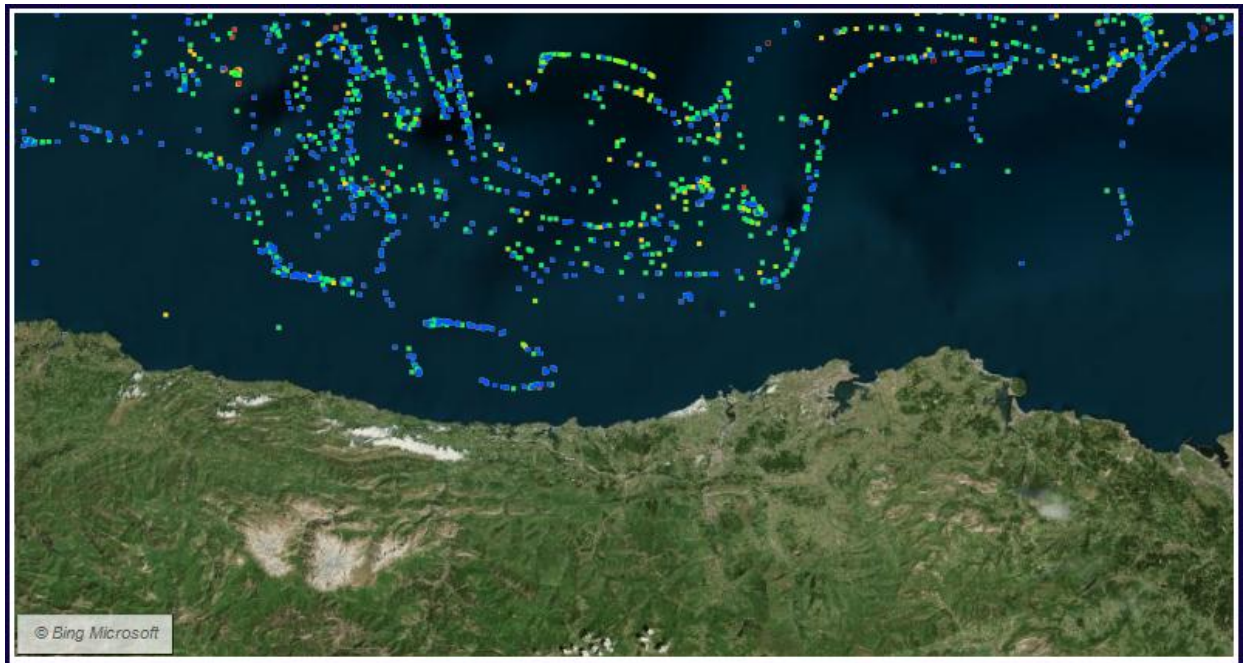


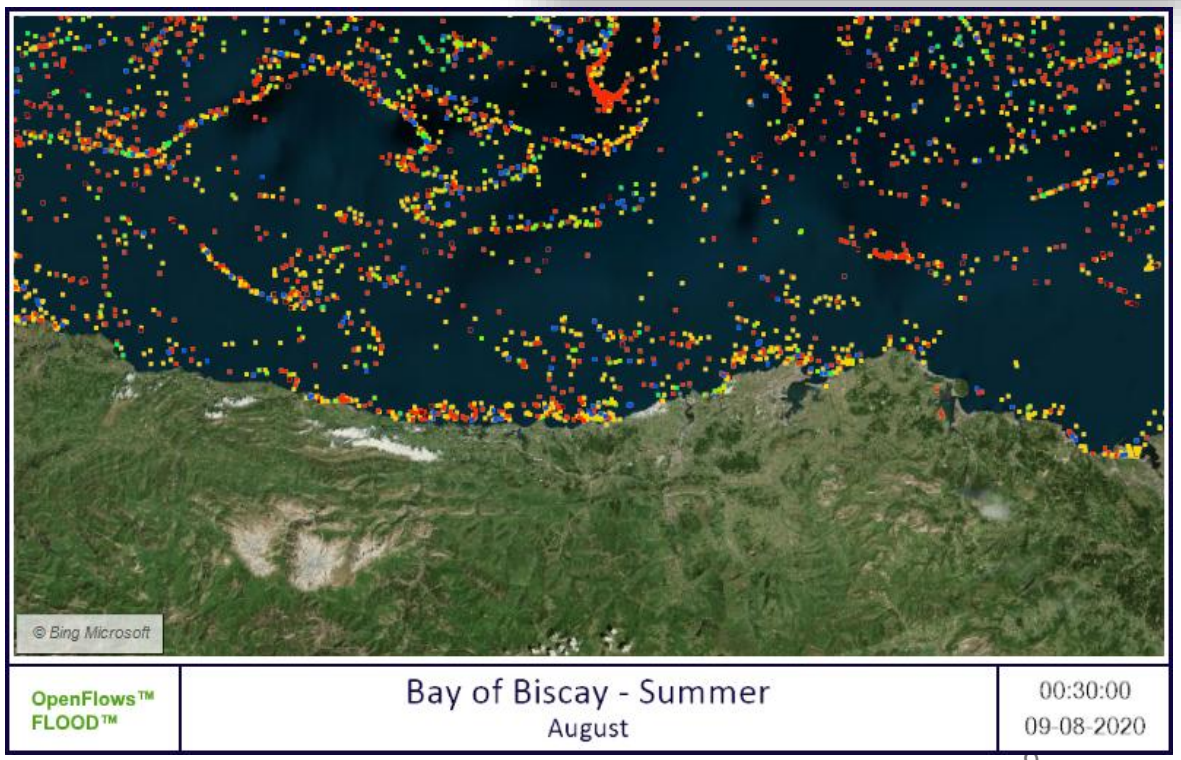


Bay of Biscay Study Case

Results







Next Steps

Quantify Land-Retained Tracers (on going)
Determine the number and origin of tracers that remain on land.

Compare Plastic Types (on going)
Simulate and analyze different plastic items (e.g., bags, bottles, bottle caps).

Model Current Timeframes
Run simulations for present-day periods (2024–2025).

Influence of external factors (on going)
Marine traffic and rivers

Thank you for your attention

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