Inspire
coastal challenges

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IRD

European Pavilion

# Digital Ocean

Nice | France
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# Sargassum monitoring

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coastal challenges

Cristele Chevalier, A. Minghelli, J. Descloitres, A. Minghelli, S. Barbier, L. Berline, L. Schamberger, M. Chami, C. Chevalier, A. Costa da Silva, L. Courtrai, P. Daniel, W. Daniel, M. Debue , J. Descloitres, J.-R. Gros-Désormeaux, T. Guinaldo, M. Laval, J. Lepesqueur, C. Lett, C. Nicolas, A. Molcard, P. Palany, W. Podlejski, A. Salazar, S. Saux-Picart, R. Villier …

# Sargassum origin
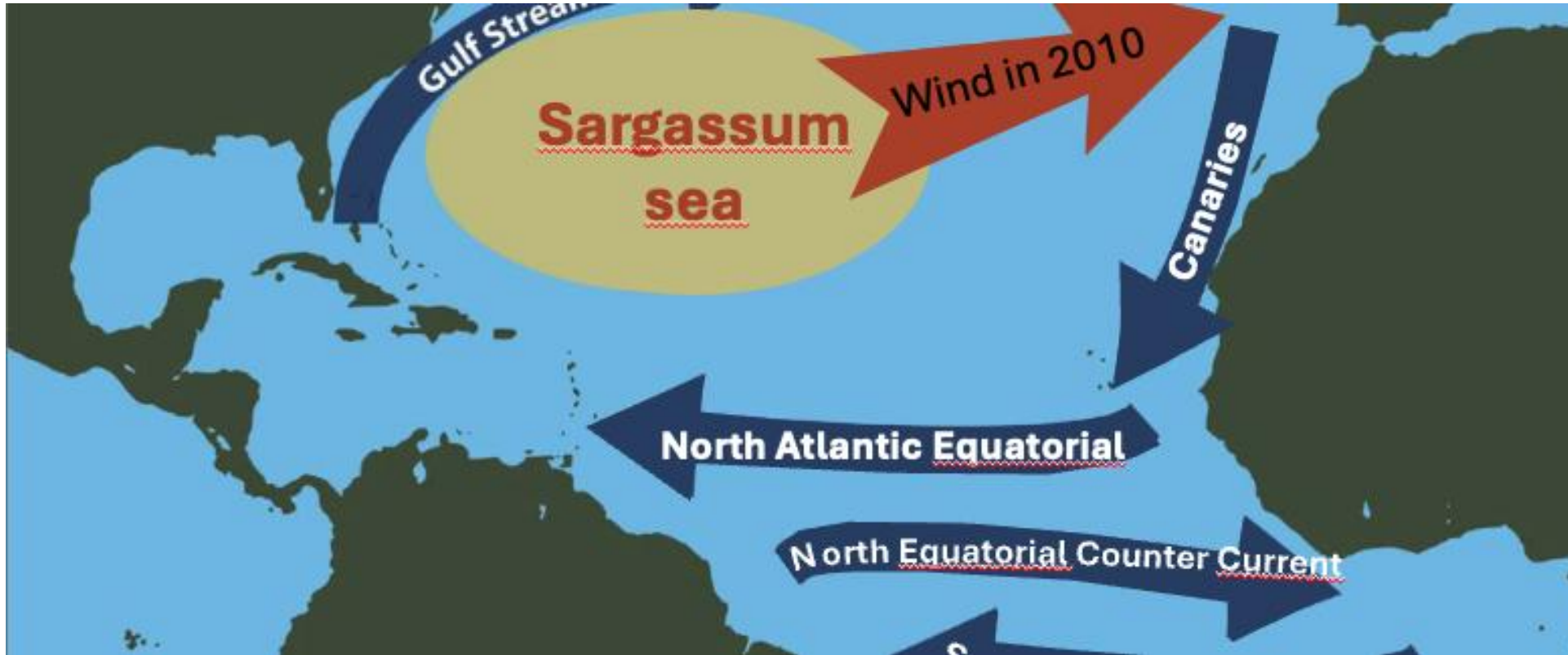


Originating from the Sargasso Sea, these algae emerged further south in 2009-2010, likely due to unusual westerly winds observed during that winter.
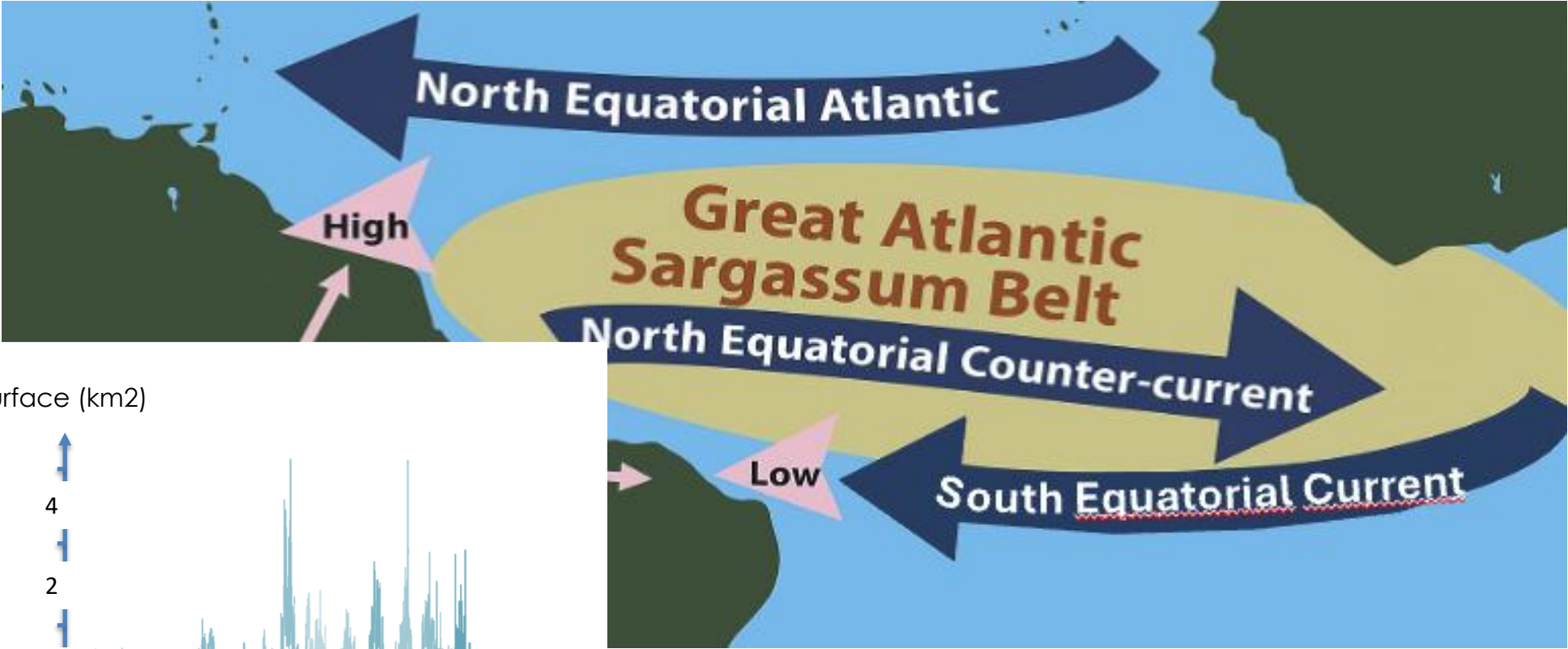
# Sargassum origin



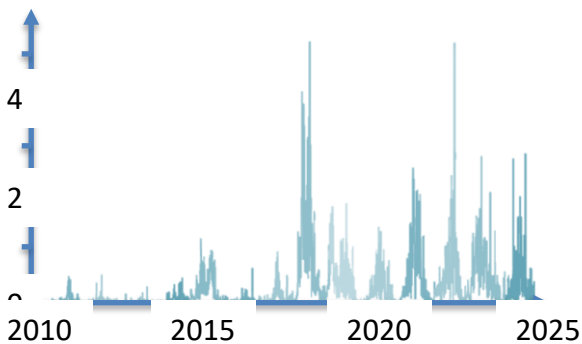Now, these algae remain in the Great Atlantic Sargassum Belt
Driven by wind and current they goes from east to west of the Atlantic

# Sargassum origin



Surface (km2)



Area covered by Sargassum in the western Atlantic (Météo France)

**and their abundance increased**

# Sargassum impact



**Massive sargassum stranding on the coast**

# Sargassum impact



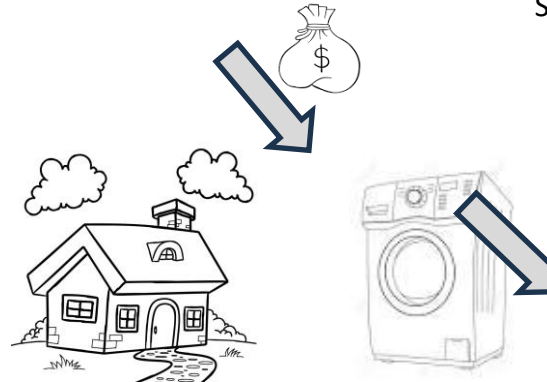**Massive sargassum stranding on the coast ...**

mangroves
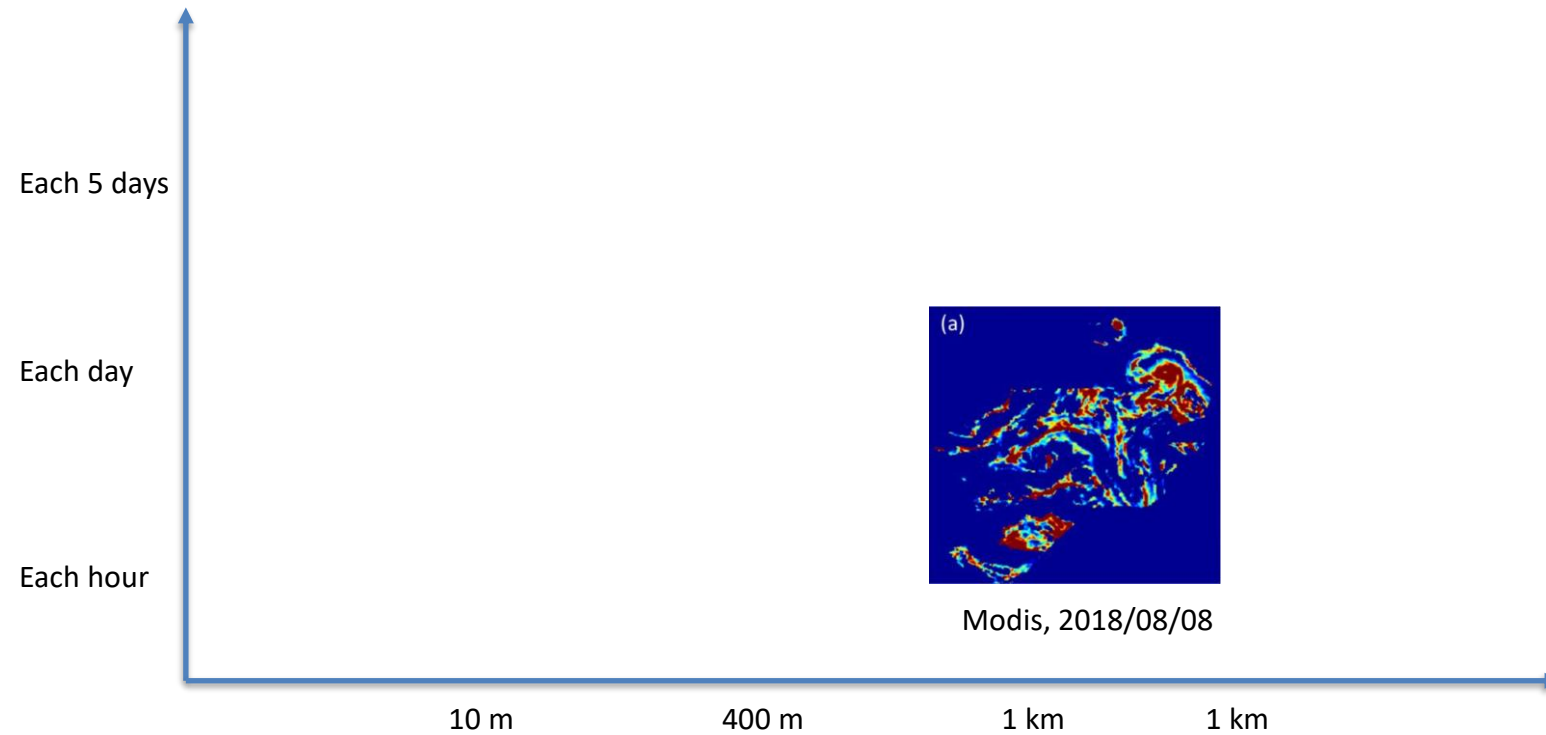
Environnemental damage

Sanitary damage

Economical damage

**... They induce different damages**

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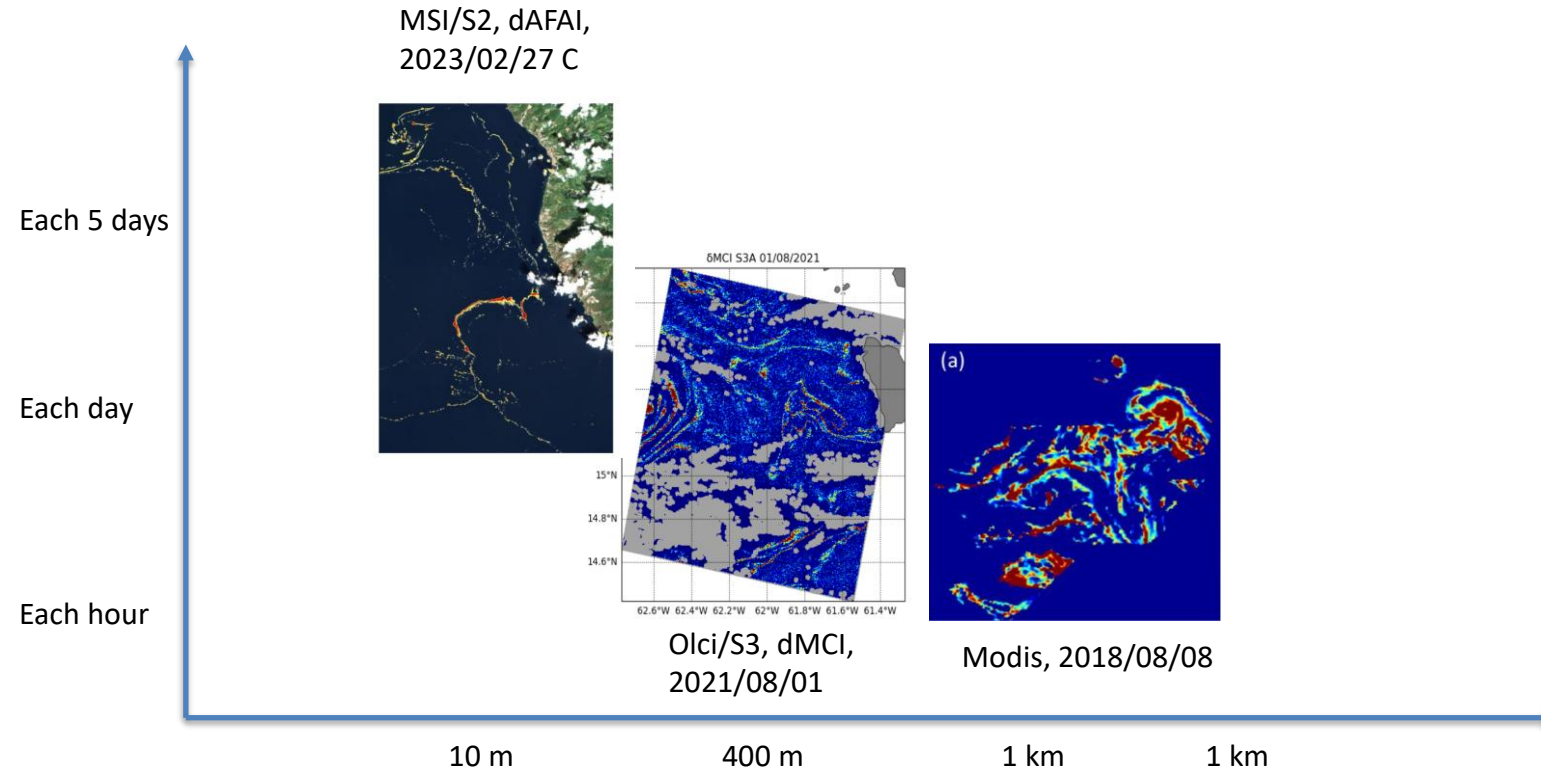
# Monitoring their distribution



Modis, 2018/08/08

Each 5 days

Each day

Each hour

10 m    400 m    1 km    1 km

**Observation from Satelitte**

# Monitoring their distribution

MSI/S2, dAFAI,
2023/02/27 C

Each 5 days

Each day

Each hour

δMCI S3A 01/08/2021

15°N
14.8°N
14.6°N

62.6°W 62.4°W 62.2°W 62°W 61.8°W 61.6°W 61.4°W

(a)

Olci/S3, dMCI,
2021/08/01

Modis, 2018/08/08

10 m          400 m          1 km          1 km

**Observation from Satelitte**

# Monitoring their distribution



MSI/S2, dAFAI, 2023/02/27 C

Each 5 days

Each day

Each hour

GOES, 2018/08/08

Olci/S3, dMCI, 2021/08/01

Modis, 2018/08/08

10 m          400 m          1 km          1 km

**Observation from Satelitte**

# Monitoring their drift



13:30

**Observation from Satellite**

# Monitoring their drift



13:30
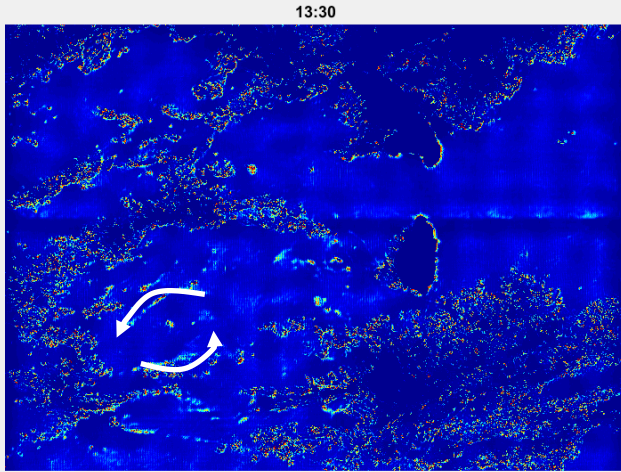
Goes with Eddy
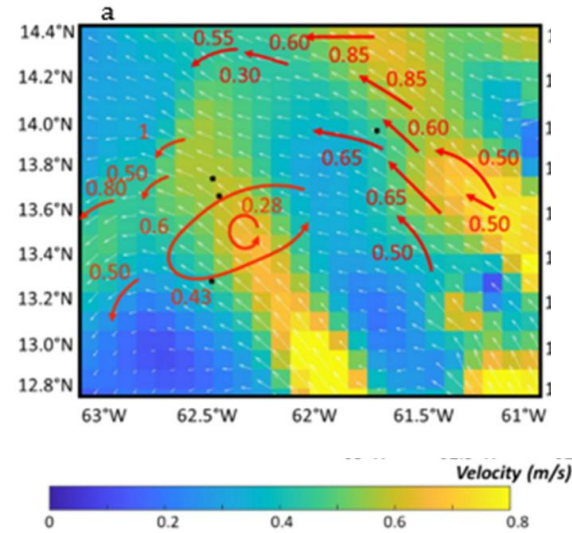


Modeled surface velocity and drift of aggregations derived from GOES
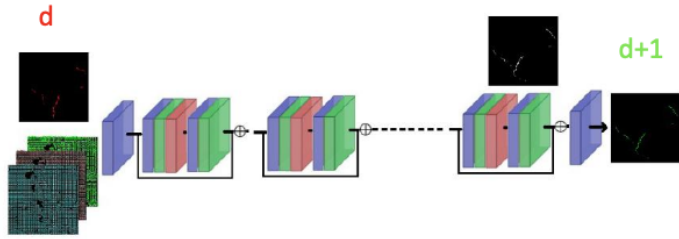
**Observation from Satellite**

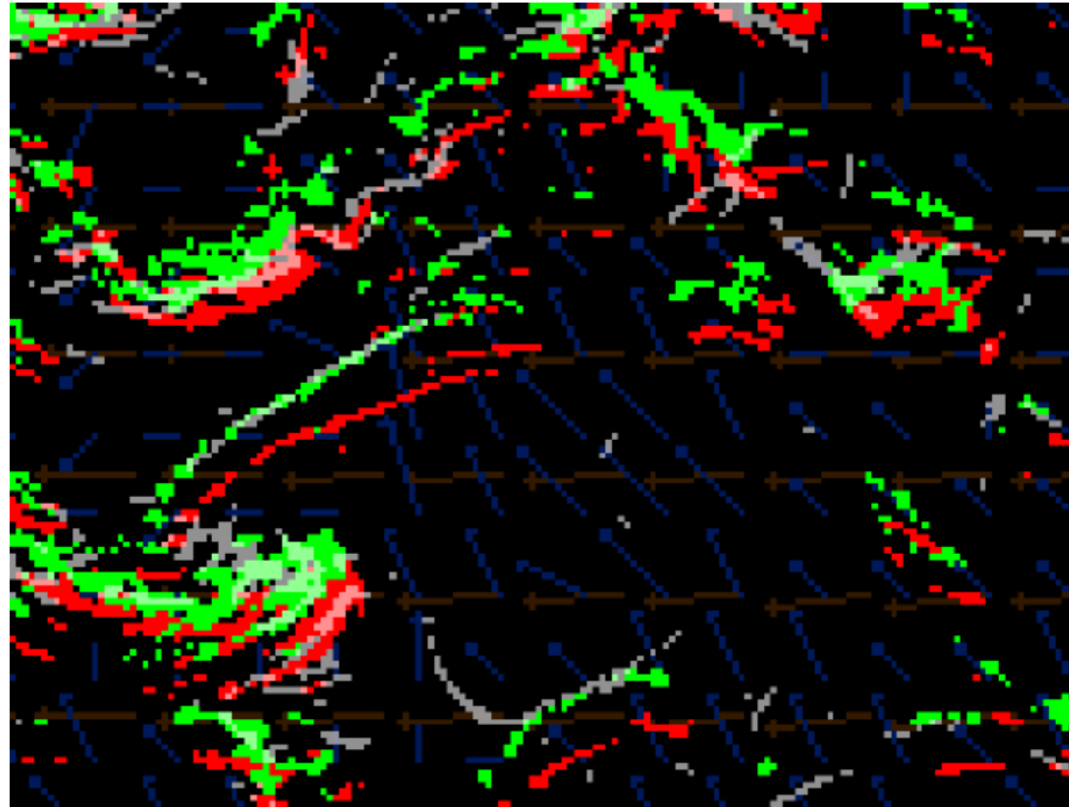# Contribution to model
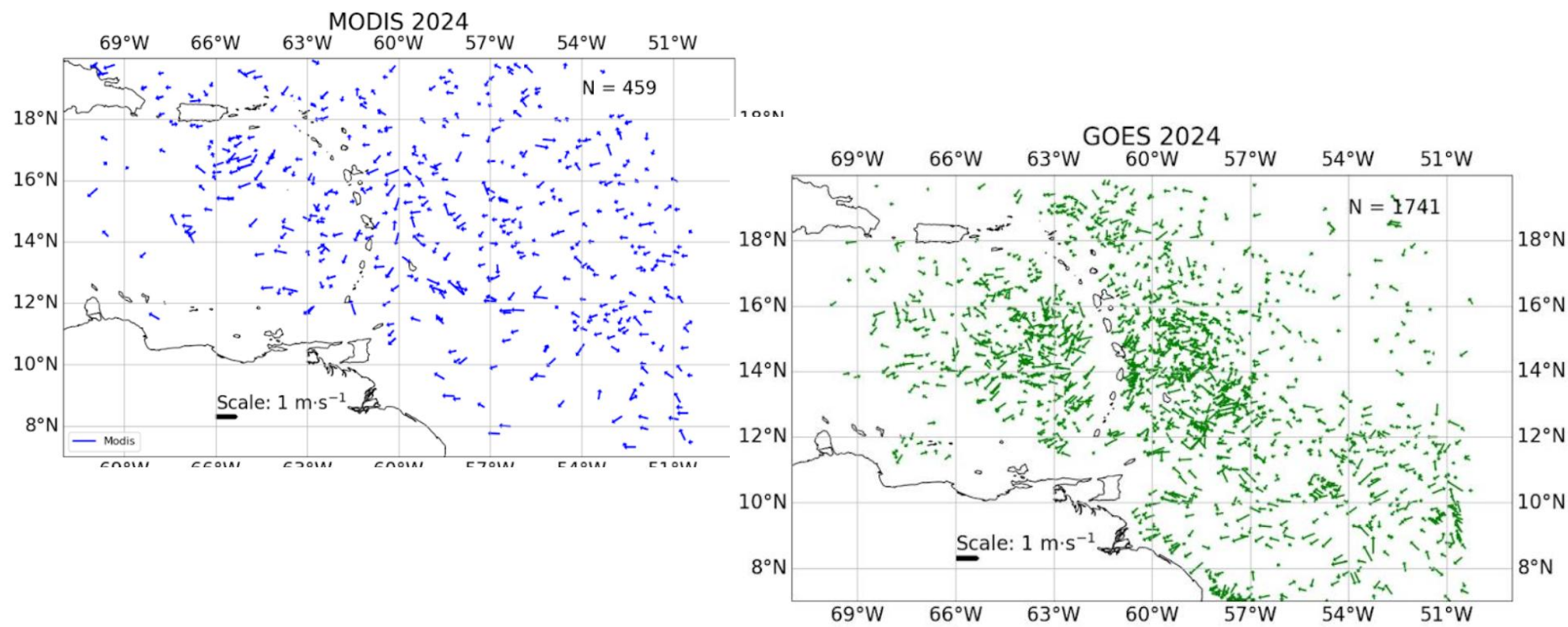


**Velocity Estimation from satellite**

# Drift Forecasting



d
d+1
Validation

**Use IA to estimate forecasting**

# Inspire
## coastal challenges

- 4 databases (from 2010 – 2025) of sargassum observed from satellite images is soon available
- These database are useful to improve the drift forcasting

**Furthermore :**

• A useful in situ campaign to validate the products (detection, abundance, velocity and biomass)

• Citizen Science is also developed to help in this detetion and forecasting