

4TH GEO

BLUE PLANET SYMPOSIUM

4-6 July 2018 – Toulouse, France



Ocean Information for Maritime Transport: Status & perspectives

Gilles Larnicol, Collecte Localisation Satellite



#GEOBluePlanet4

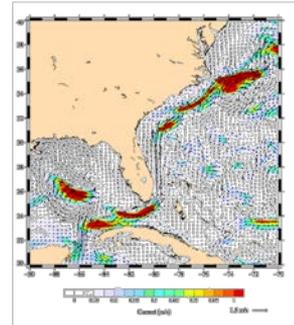
Maritime Transport Challenges

The needs

- Enhance the safety of crew and equipment
- Respect scheduled time at passage gates (Suez, Panama) and at arrival
- Reduce fuel consumption for ecological (CO₂) & economical (\$) reasons

Solutions

- Optimize engines, propellers, hulls,
- **Take benefit of Ocean & Meteorological information**



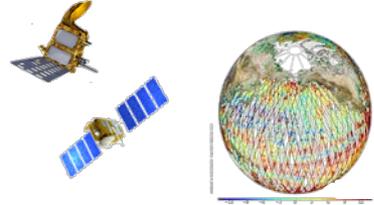
Ocean Information for maritime transport



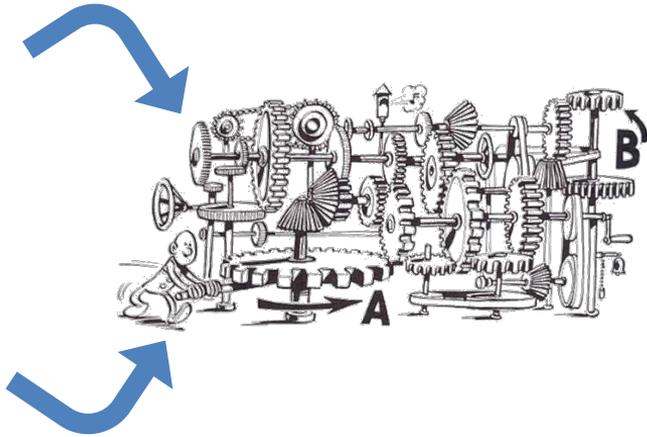
- Surface (0-15m)
- Analysis & Forecast
- Worldwide
- Reliable

Where the data come from ?

Satellites

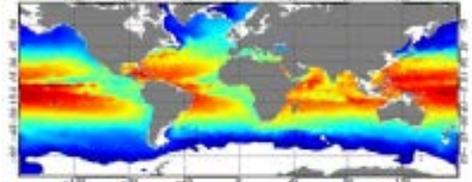


In-Situ



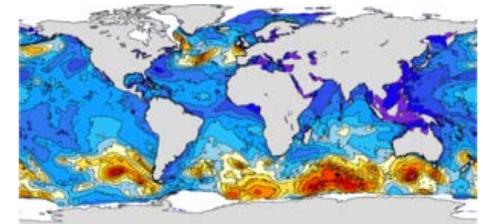
Mapping

Obs-based Products



Assimilation

Model Products



Where the data come from ?

COPERNICUS MARINE ENVIRONMENT MONITORING SERVICE
Providing PRODUCTS and SERVICES for all marine applications

ABOUT US | MARKETS & BENEFITS | NEWS | SCIENCE & MONITORING | TRAINING & EDUCATION | SERVICES PORTFOLIO | SHORT-CUT TO SERVICES

ACCESS YOUR OCEAN INFORMATION

GETTING STARTED →

OCEAN PRODUCTS
Ocean product catalogue, to download or visualize data across more than 10 variables, including historic, current and forecasted data.

OCEAN MONITORING INDICATORS
Essential variables monitoring the health of the ocean

OCEAN STATE REPORT
Extensive annual analysis on the state of the ocean over nearly 20 years and severe/notable annual events

DATA → | **TRENDS** → | **EXPERTISE** →

28 EVENTS AGENDA

PARTNERS AND STAKEHOLDERS

FOCUS ON

TRAINING AGENDA

4TH GEO BLUE PLANET SYMPOSIUM IN TOULOUSE TO FOCUS ON THE OCEAN

Mercator Ocean, in the frame of the Copernicus Marine Service, has organized with GEO Blue Planet and the Université Federale Toulouse Midi-Pyrénées, the 4th GEO Blue Planet Symposium from July 4th-6th, 2018. It will be held in Toulouse, France, home to Mercator Ocean.

READ MORE

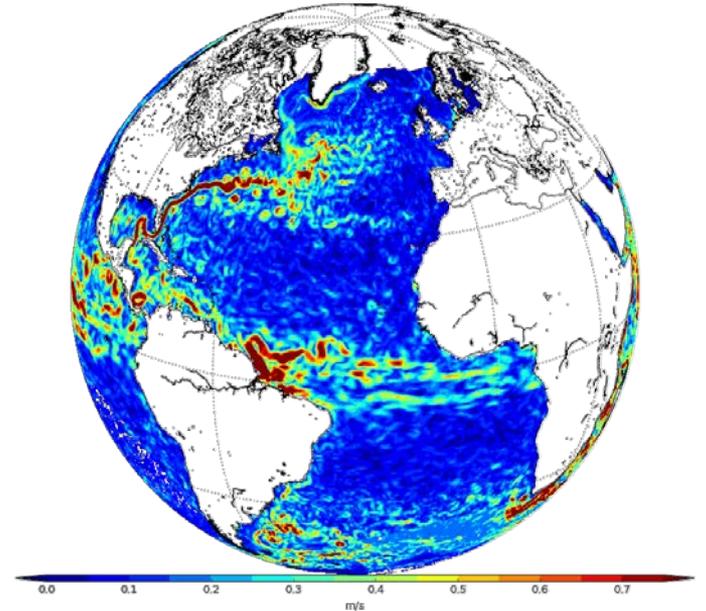
4TH GEO JULY 4-6, 2018 TOULOUSE, FRANCE
BLUE PLANET SYMPOSIUM
Our Future is Blue: Linking Ocean and Coastal Information with Societal Needs

Open and free
Products and Services

<http://marine.copernicus.eu/>

The Currents

- **Forecast:** Global and european region
10 days forecast; 3D 1/12° daily (hourly)
- **Obs-based:** 3D analysis at 1/4° (1/8°) daily

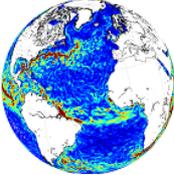


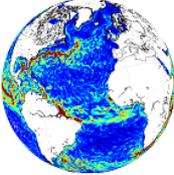
The Currents

News Flash!

New products
Service open yesterday !

- Obs-based global surface current product
Physical content: geostrophy + ekman
Global $\frac{1}{4}^\circ$ daily, NRT and Reprocessing
Layer: 0 and 15 metres
- Good illustration of coordination between Copernicus Service (CMEMS) and R&D (Globcurrent/ESA & CNES)

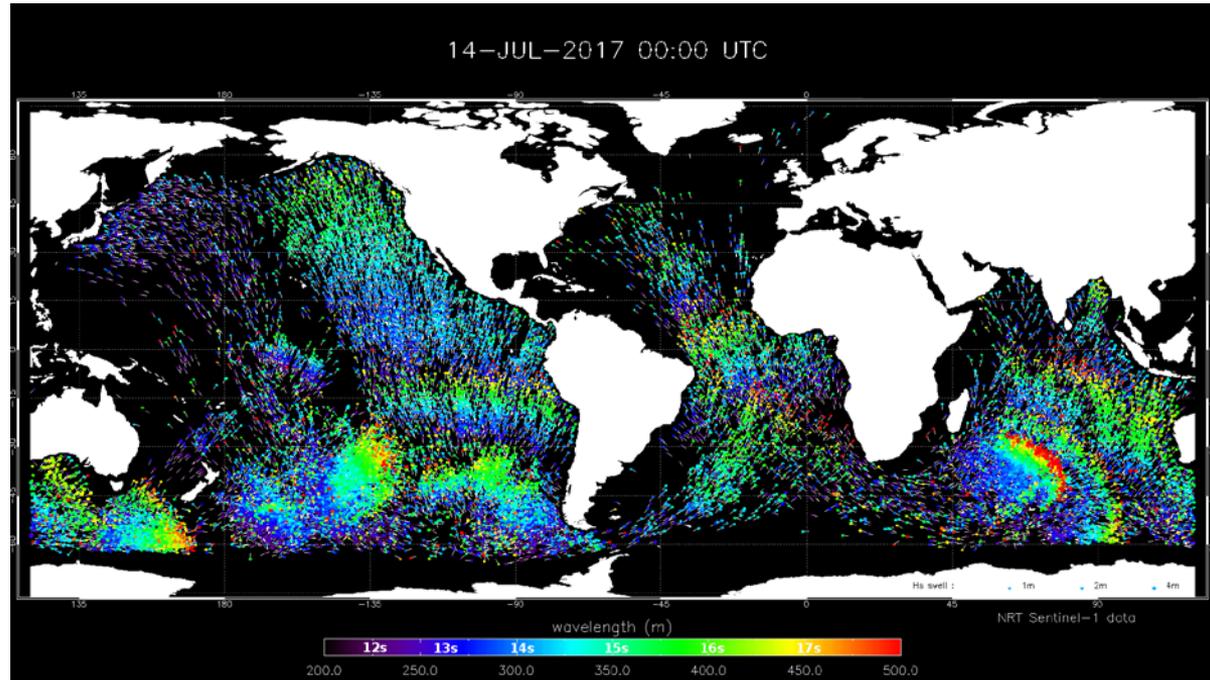
MULTIOBS_GLO_PHY_NRT_015_003		
GLOBAL TOTAL SURFACE AND 15M CURRENT FROM ALTIMETRIC GEOSTROPHIC CURRENT AND MODELED EKMAN CURRENT PROCESSING		
OBSERVATION	L4	GLO
UV	i	
0.25 degree x 0.25 degree (2 depth levels)		
From 2017-01-01 to 2018-06-21		
6-hourly-instantaneous, hourly-instantaneous, daily-mean, monthly-mean		
MORE INFO 	ADD TO CART 	WMS Sub-setting

MULTIOBS_GLO_PHY_REP_015_004		
GLOBAL TOTAL SURFACE AND 15M CURRENT FROM ALTIMETRIC GEOSTROPHIC CURRENT AND MODELED EKMAN CURRENT REPROCESSING		
OBSERVATION	L4	GLO
UV	i	
0.25 degree x 0.25 degree (2 depth levels)		
From 1993-01-01 to 2017-12-31		
6-hourly-instantaneous, hourly-instantaneous, daily-mean, monthly-mean		
MORE INFO 	ADD TO CART 	WMS Sub-setting

The wave products

Wave parameters

- Significant wave height
- Swell (H, period, wavelength)
 - Obs-based products
- 1°x1° grid, daily (altimetry)
- 0.5°x0.5°, 3 hours (SAR)
- Forecasts
- 5 days forecast at 1/12°, daily

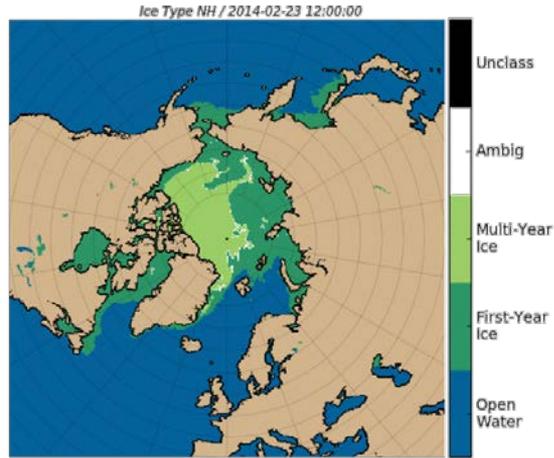
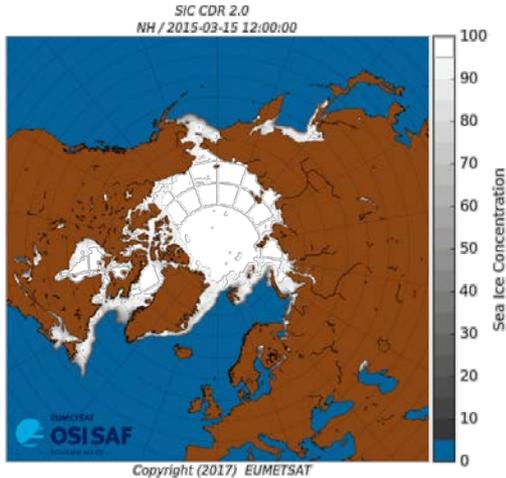


The Sea Ice products

Concentration & Type

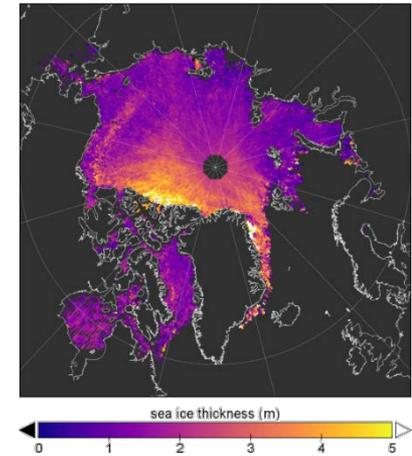
Obs-based: $\frac{1}{4}^\circ$, daily

Forecast: $1/12^\circ$, daily, 10 days



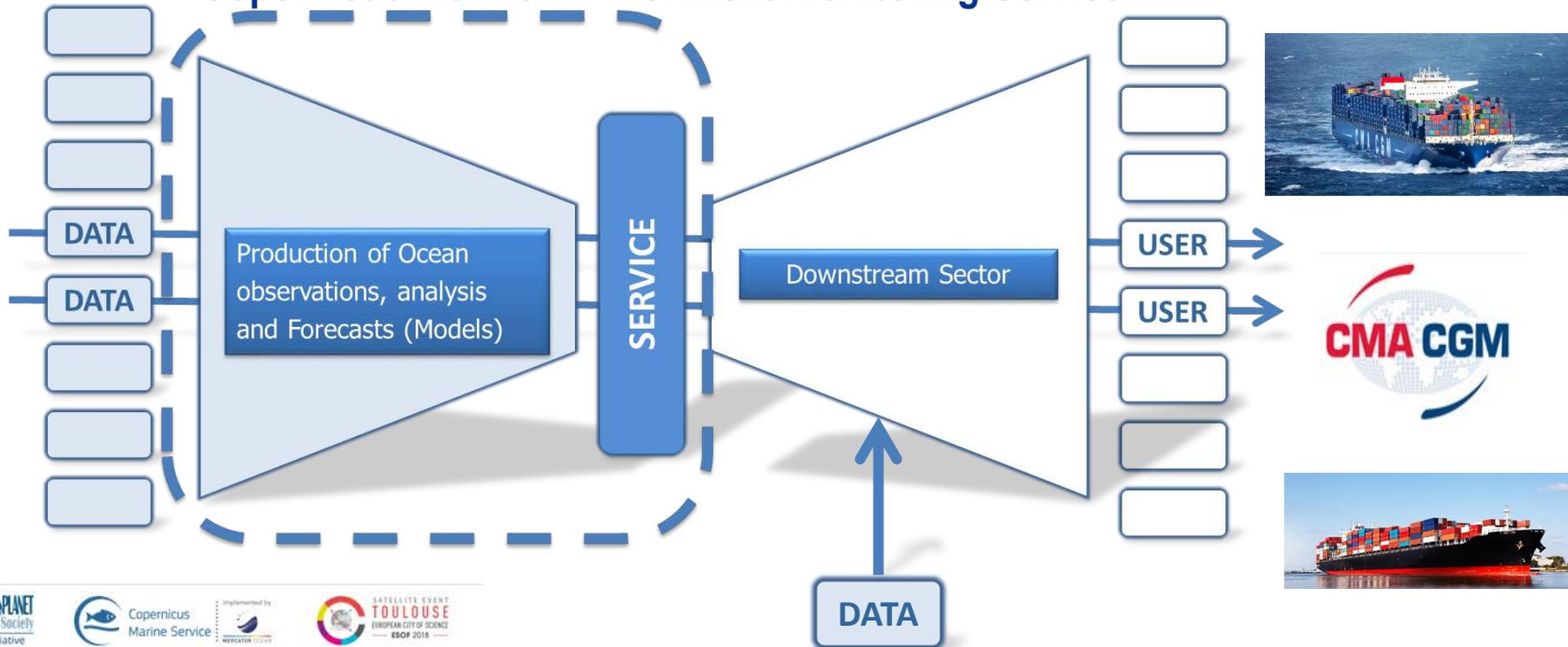
Thickness

Obs-based: $\frac{1}{4}^\circ$, monthly



End-User Needs

Copernicus Marine Environment Monitoring Service



CMA-CGM Use Case

Objective: Reduce consumption of fuel by 1%

→ for the whole CMA-CGM fleet: 60 000 t Fuel

180 000 t CO₂

A reasonable target?

Yes, if using better ocean information and in particular currents !

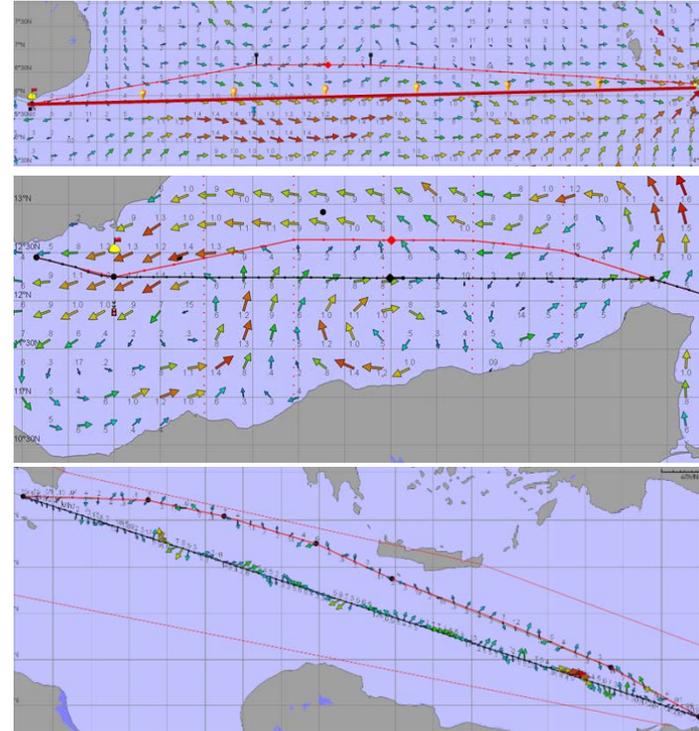
Tests for ship routing:

CMA-CGM Amerigo Vespucci between Europe and China – March / May 2015

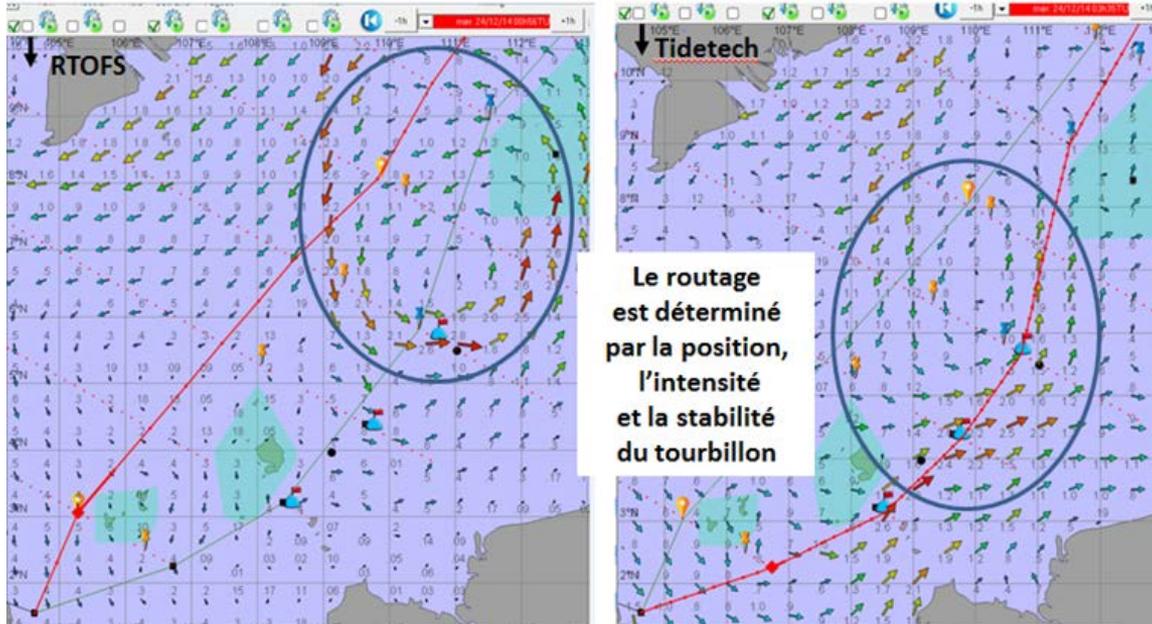
Total consumption during the voyage: 4150 t

Actual savings due to « current routing »: 19 t = 0,4%

Improvement potential: 50 t = 1,2% using better ocean information



CMA-CGM Use Case



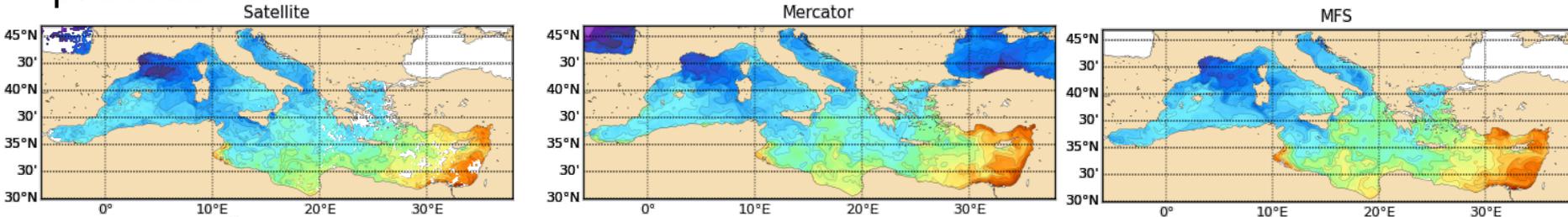
Need to select the best forecasts :

- Select best products in each area during a time window
- Verify the consistency between Observations (sat, in-situ) and model products
- Assign a confidence index

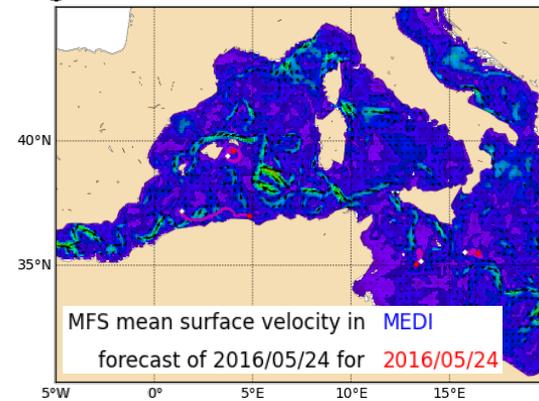
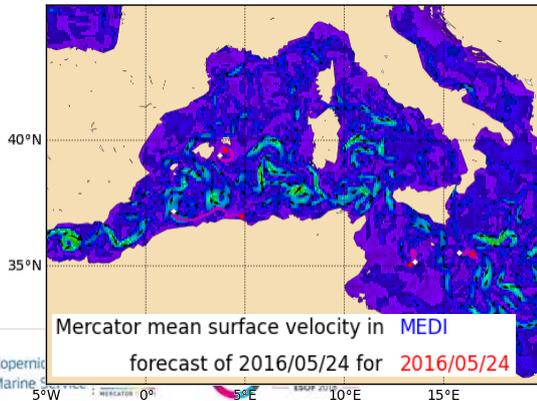
Expert in ocean processes but also on the products to be used

CMA-CGM Use Case

Illustration of Copernicus products used for the qualification and selection process

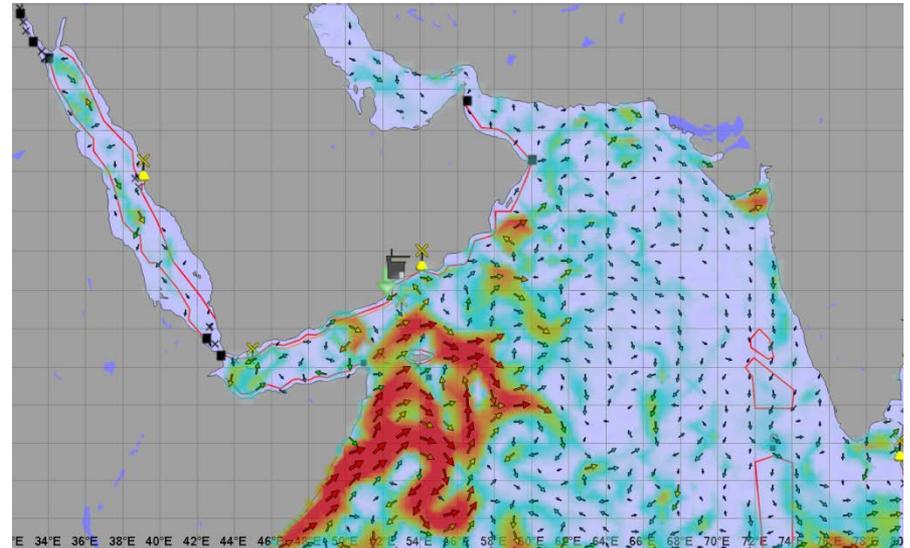
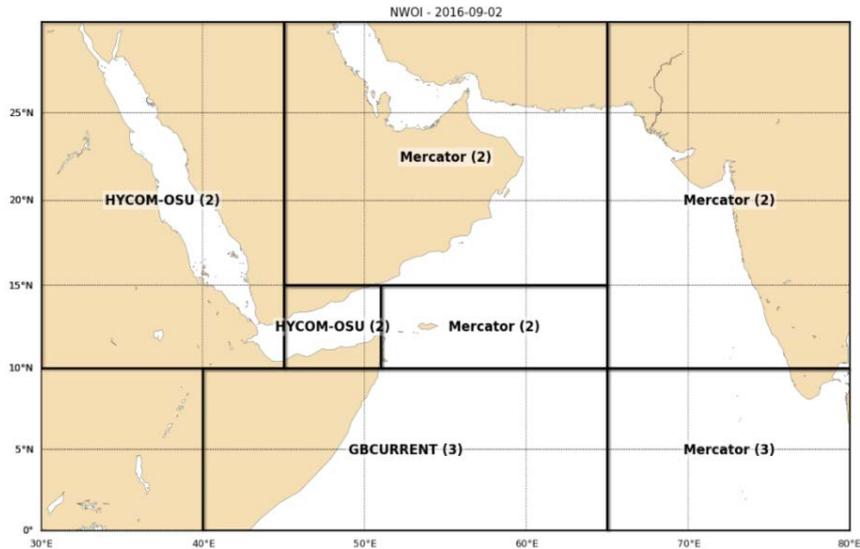


SST: 2016-05-20 → 2016-05-25



CMA-CGM Use Case

Illustration of selection of products after the selection process



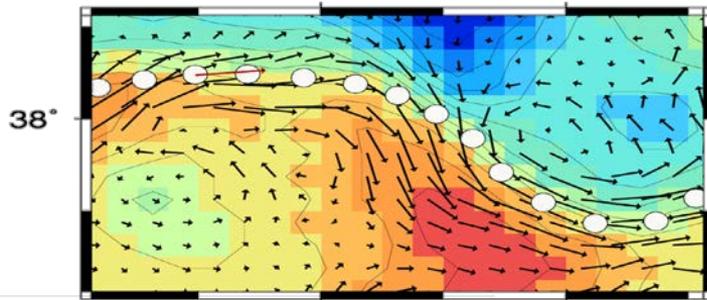
Perspectives – Future Challenges



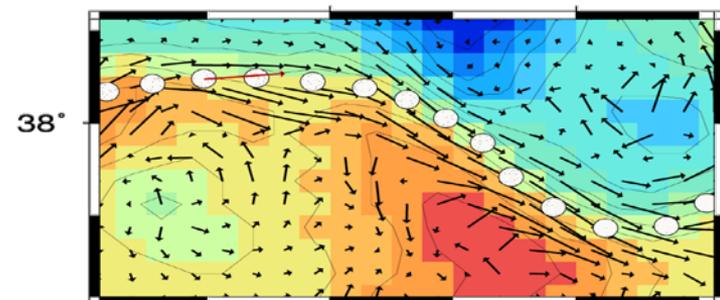
Improvement of resolution and reliability of surface currents and waves

- Increase the number of satellite
 - New satellite missions (SWOT swath)
 - Sensor synergy products
- ➔ To be assimilated by the forecast model

Altimetry



Altimetry + SST



Perspectives – Future Challenges



- Arctic Zone (high latitudes)
will become a strategic zone

Europe (Copernicus) aim to develop
a polar orbiting mission with several
instruments (SAR, Optical, Microwave)



Improved sea ice products



Thank you !