Upwelling filaments: a view through 3 different eyes

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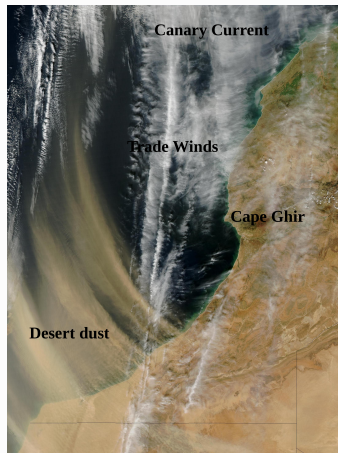
November 27, 2009

Questions:

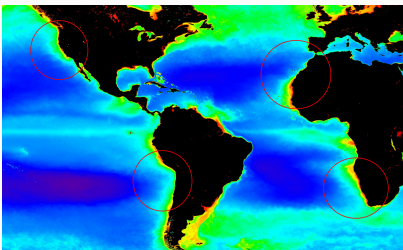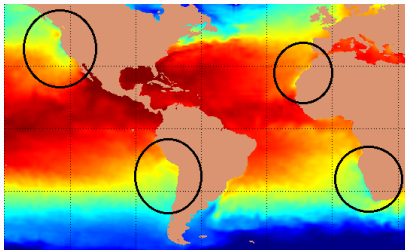- what is your work?
- is it useful?
- do you study tsunami?

Answers:

- currents around NW Africa
- regions with large stocks of fish
- upwelling filaments
- consequences of possible climatic changes

Canary Current

Trade Winds

Cape Ghir

Desert dust

Nice! But what if we look with satellite's eye?

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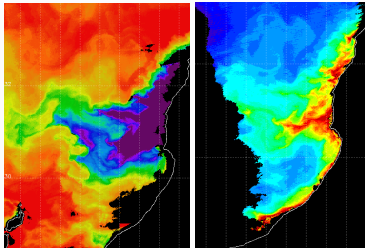**Upwellings:**

  ✓ cool water/ high chlorophyll concentration

  ✓ mechanisms: wind + earth rotation
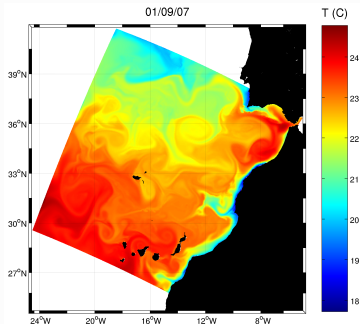
  ✓ relation between physics and biology

Filaments:

  ✓ offshore movement

  ✓ exportation of nutrient-rich waters

  ✓ mechanisms: wind + coastline + bottom + ...

We have to go inside!
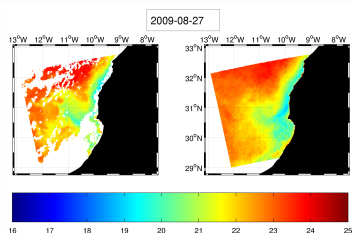
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1. Model = idealization of the reality

$\rightarrow$ Localization + dimensions

$\rightarrow$ Ingredients: wind + geometry + friction

$\rightarrow$ Mechanism: *vorticity balance* **poster 103**

(from my course of Mechanics)

2. Satellite image reconstruction

$\rightarrow$ Fill in the gaps

$\rightarrow$ Space and time variability

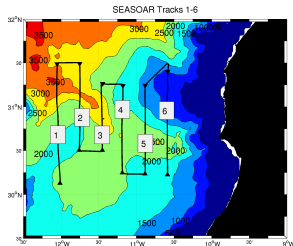Now we know where to go!

3rd eye: in situ measurements

CAIBEX campaign,
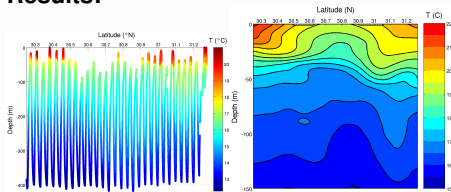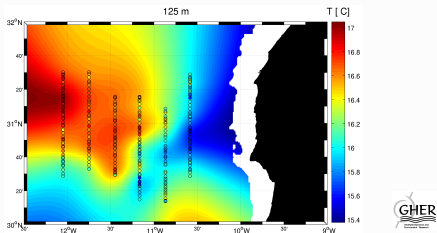16 August – 5 September 2009

Strategy:

- high-resolution sampling using SeaSoar
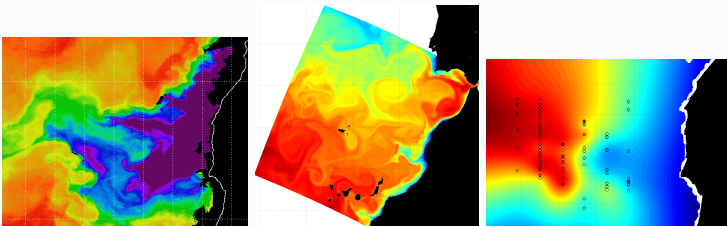- CTD inside/outside the filament
- ARGO buoys

Results:

1. shallow structure ($\sim 50\ m$),
2. less than 100 km wide,
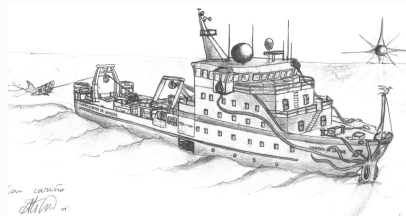3. temperature difference:$\sim 3^{\circ}C$,
4. high productivity.

Tools

In situ data analysis

Satellite image filling

Numerical model

Still to be done

✓ Analyze the data

✓ Combine the different sources

✓ Validate the model

Thanks for your attention!

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