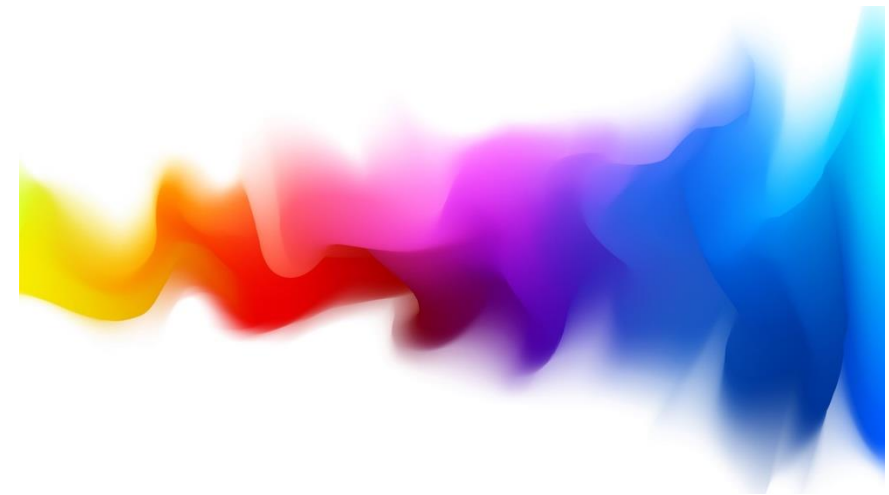


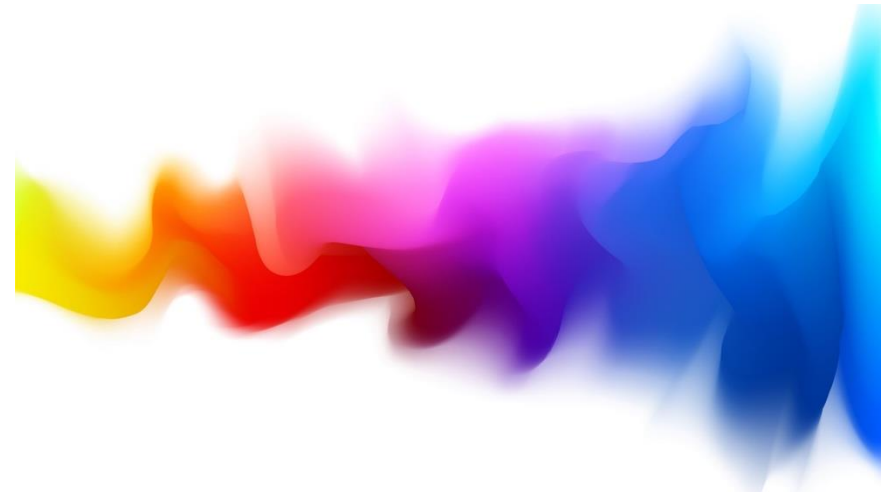
PATASWOT: Comprehending the physical processes impacting the PATagonian southwestern continental shelf and adjacent open ocean using SWOT data

Laura A. Ruiz-Etcheverry, Martín Saraceno,
Florence Birol, Alberto Piola, Maristella
Berta, Silvia Romero, Valeria Guinder, Claudia
Simionato, Matias Dinapoli, Giuliana Berden,
Nicolas Bodnariuk



Collaborators and students

Carola Ferronato, Sebastian Cornejo-Guzman, Melina Martinez, Milagro Urricariet, Fernando Becker, Ornella Silvestri, Martin Rivarossa, Fernando Ramirez, Celeste Antieco, Estefania Fernandez, Candela Lopez Fidel



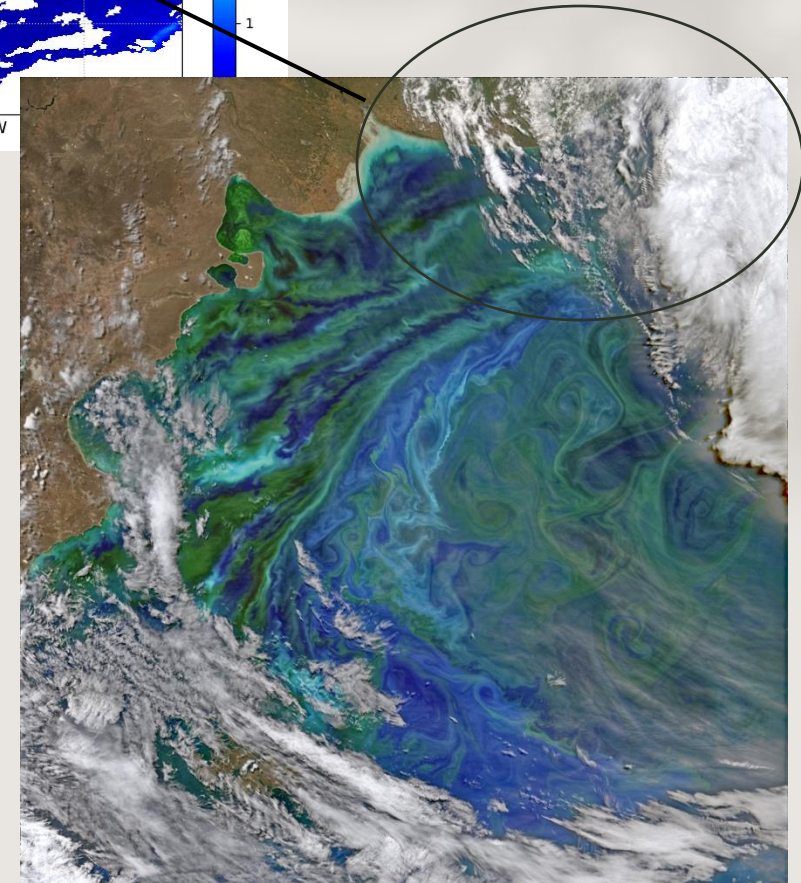
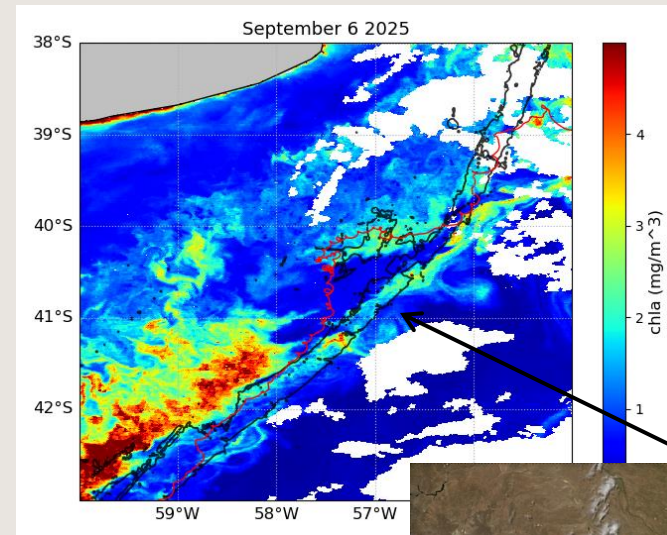
Motivation

(Q1) What are the main physical drivers of the large biological activity observed over the Patagonian shelf and slope?

(Q2) Does the Malvinas Current (MC) act more as a blender or as a barrier between open ocean and shelf waters?

(Q3) How the first levels of the nutrient chain (phytoplankton and dissolved inorganic nutrients) are structured within the water column according to the physical conditions characteristic of the Patagonian shelf, Patagonian upper slope, and oceanic water beyond the MC?

The **main objective** of PATASWOT is to improve our understanding of the physical processes impacting the Patagonian continental shelf and adjacent open ocean through the use of SWOT data, traditional satellite altimetry, in-situ and model output data.



Objectives

1. To validate SWOT data and geophysical correction against in situ data in the Patagonian continental shelf and shelf-break
2. To discern the physical processes measured by SWOT during the initial 1-day repeat orbit.
3. To characterize the water exchange between the Patagonian shelf and open ocean.
4. To discern the dynamics of the submesoscale that modify the distribution of chlorophyll, heat and carbon fluxes.
5. To characterize the short-term evolution of the phytoplankton and its composition in the water masses.

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WP1: Shelf and coastal altimetry

PhD student S. Cornejo Guzmán



Poster!! ST2025OS2_009 - SWOT data validation on the Patagonian Continental Shelf: Optimized tidal and atmospheric corrections for submesoscale resolution

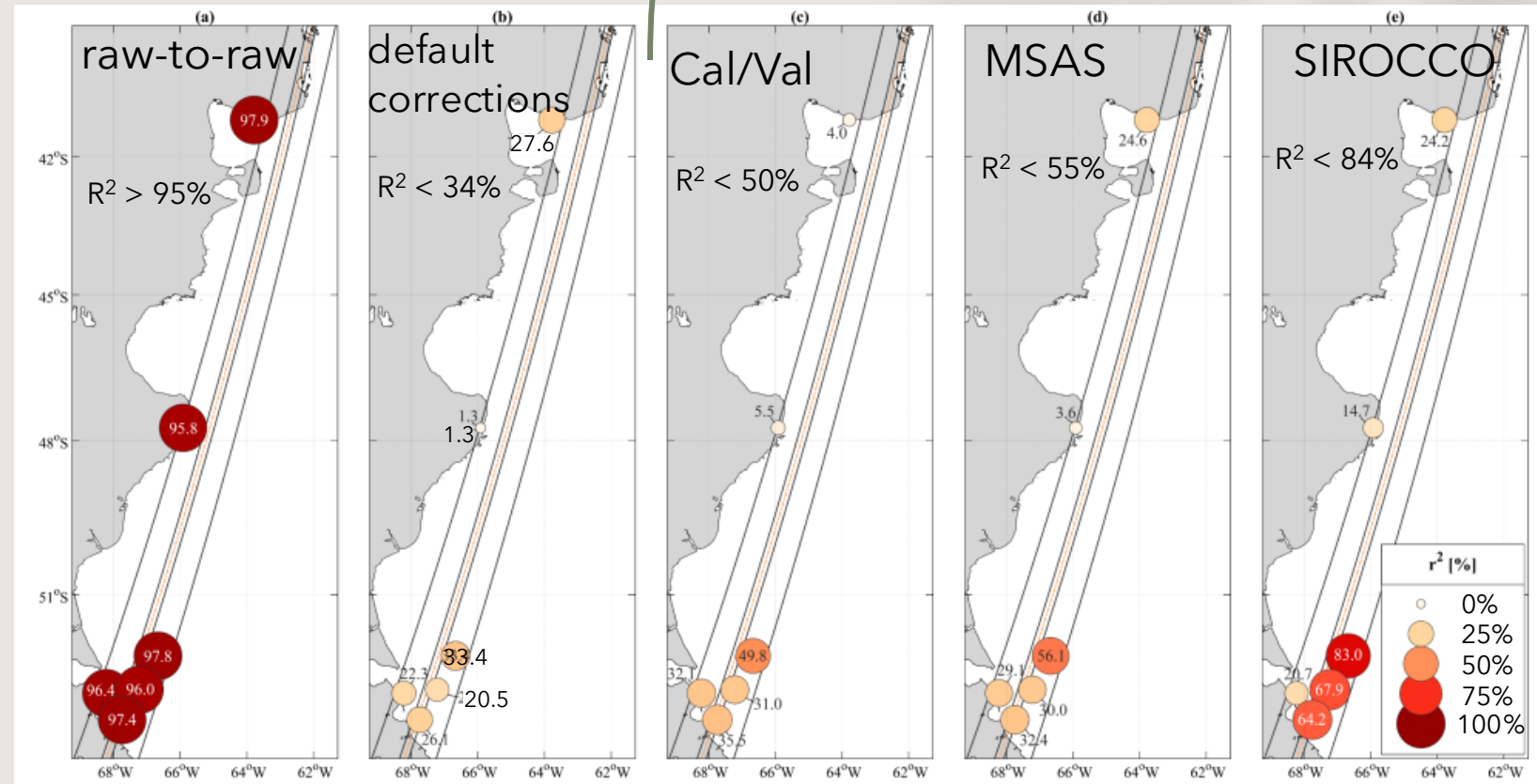
► **Regional DAC is critical for accuracy**

► **Tidal models fail at local scales**

► **Aliasing masks high-frequency wave dynamics:** Temporal aliasing from daily sampling masks true high-frequency dynamics

► **Sampling reverses perceived wave direction:** The daily sampling interval is insufficient to resolve northward-propagating waves

DAC



WP5: Toward an improved regional tide model

- MSAS: Modeling System for the Argentine Sea. Based on CROCO model. M. Dinapoli and C. Simionato work on the improvement and development of a barotropic and baroclinic regional model



<https://www.cima.fcen.uba.ar/pronosticando-el-mar-argentino/>

Dinápoli, M. G. and Simionato, C.G., 2025b: On the impact of Southeastern Pacific-generated storm surges on the Southwestern Atlantic Continental Shelf: Interoceanic connections through coastally trapped waves. *Journal of Geophysical Research: Oceans*, 130, e2024JC021685. <https://doi.org/10.1029/2024JC021685>

Dinápoli M. G. and C. G. Simionato, 2025: Oceanic barotropic response to the seasonal to long-term atmospheric variability in the Southwestern Atlantic Continental Shelf. *Climate Dynamics*. In revision.

Dinápoli, M. G., Simionato, C.G., Alonso, G. et al., 2024: Negative storm surges in the Río de la Plata Estuary: mechanisms, variability, trends and linkage with the Continental Shelf dynamics. *Estuarine, Coastal and Shelf Science* 305, 0272-7714. <https://doi.org/10.1016/j.ecss.2024.108844>.

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WP2: Submesoscale structures

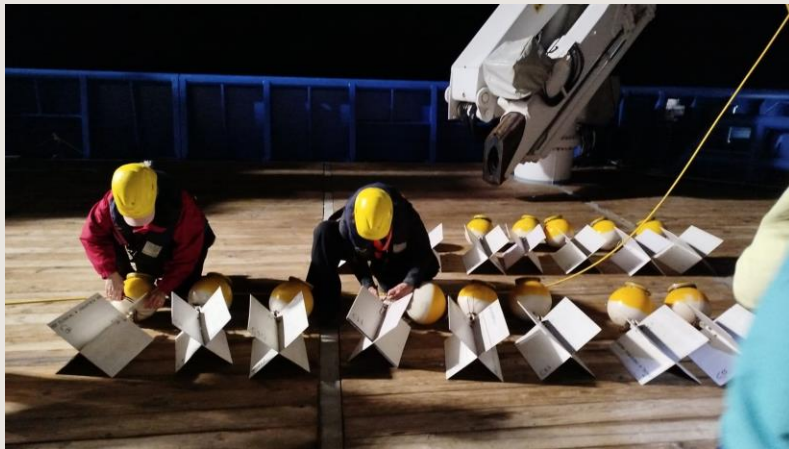
Master student: C. Lopez Fidel



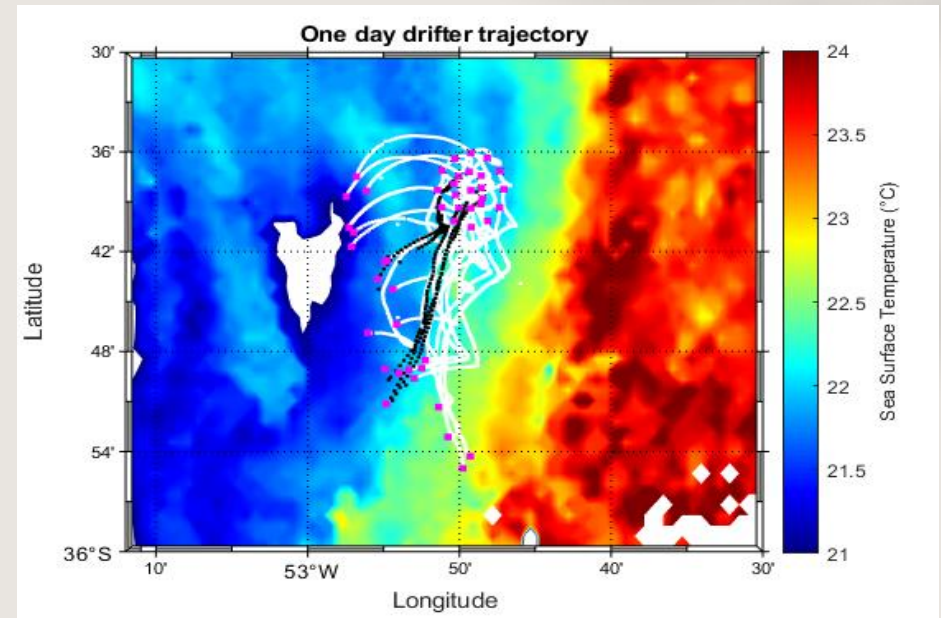
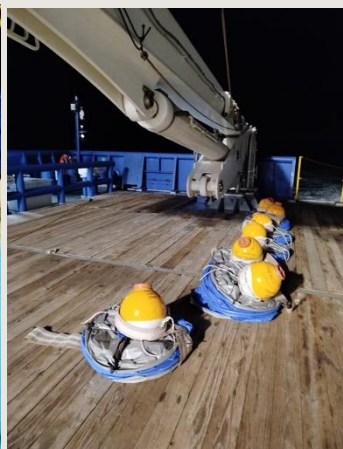
Launch of 23 drifters (5 SVP, 18 carthe) in January 2025 on the Confluence Brazil-Malvinas

Poster!! ST2025OS3_013 - Lagrangian characterization of fine-scale processes (1 to 10 km) using an array of surface drifters in the Brazil Current

Carthe



SVP



Different water masses?

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WP2: Submesoscale structures; WP3: Shelf/Open ocean exchange

WP6: Phytoplankton and nutrients in Lagrangian drifter experiments

A multidisciplinary cruise is on going on board R/V Falkor (too)

Poster!! ST2025OS2_019 - Patagonian Shelf Break Front (PSBF): Seabed morphology, water masses and ocean currents.



PI: S. Romero



G. Bozzano



O. Silvestri
Co-PIs



L. Ruiz-Etcheverry

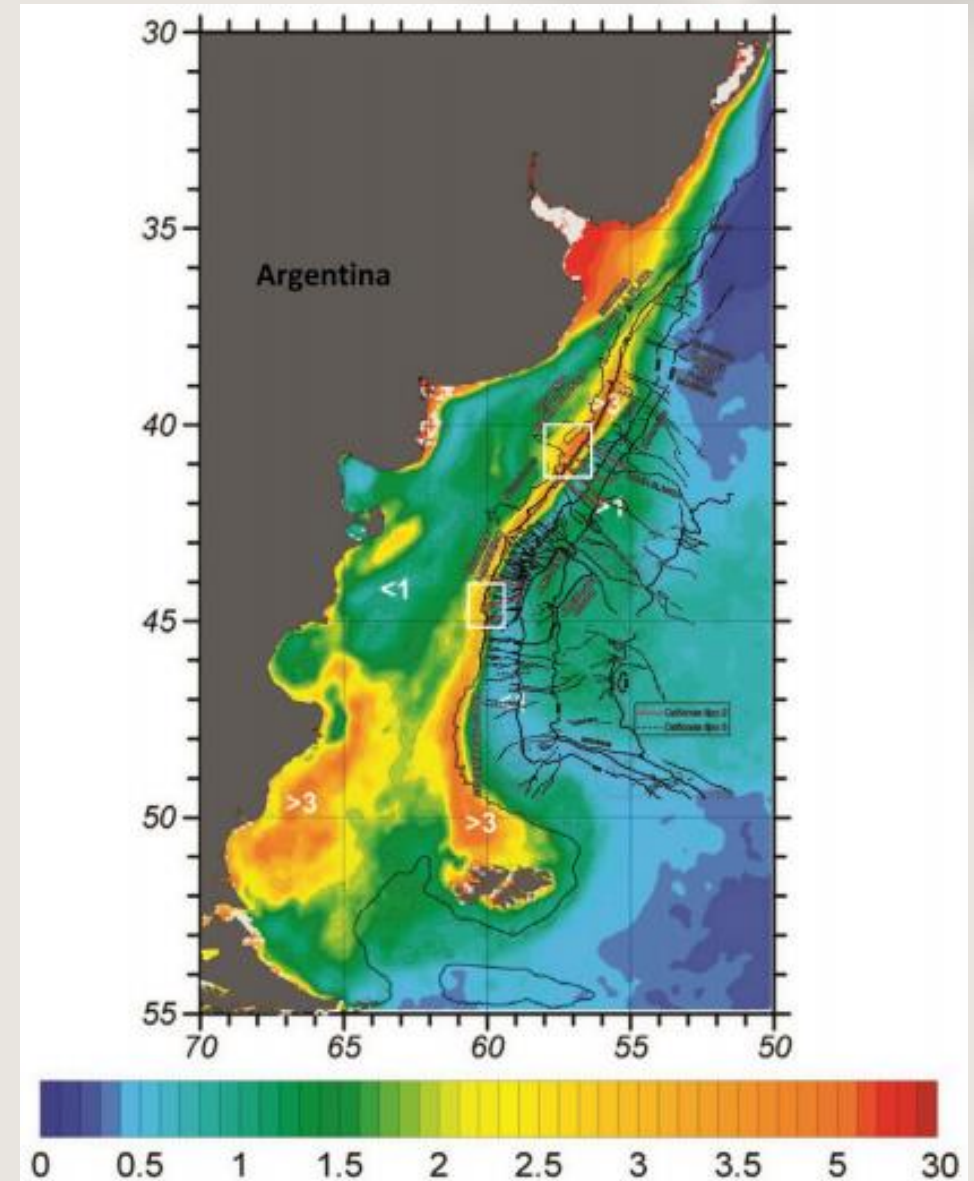


**Ecos de 2
Cañones**

@ecode2caniones

@schmidtocean

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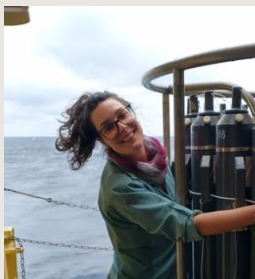
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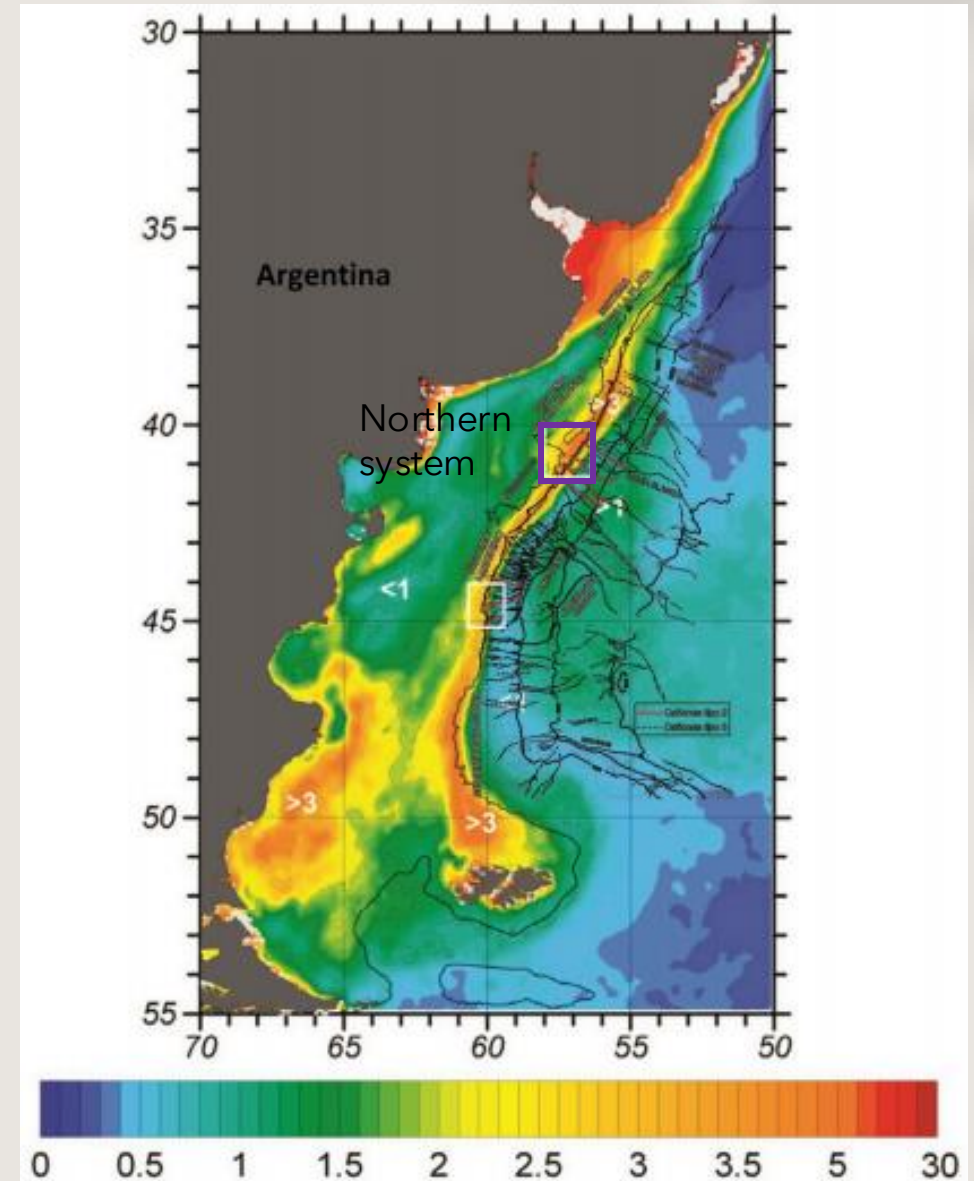
G. Bozzano



O. Silvestri
Co-PIs



L. Ruiz-Etcheverry



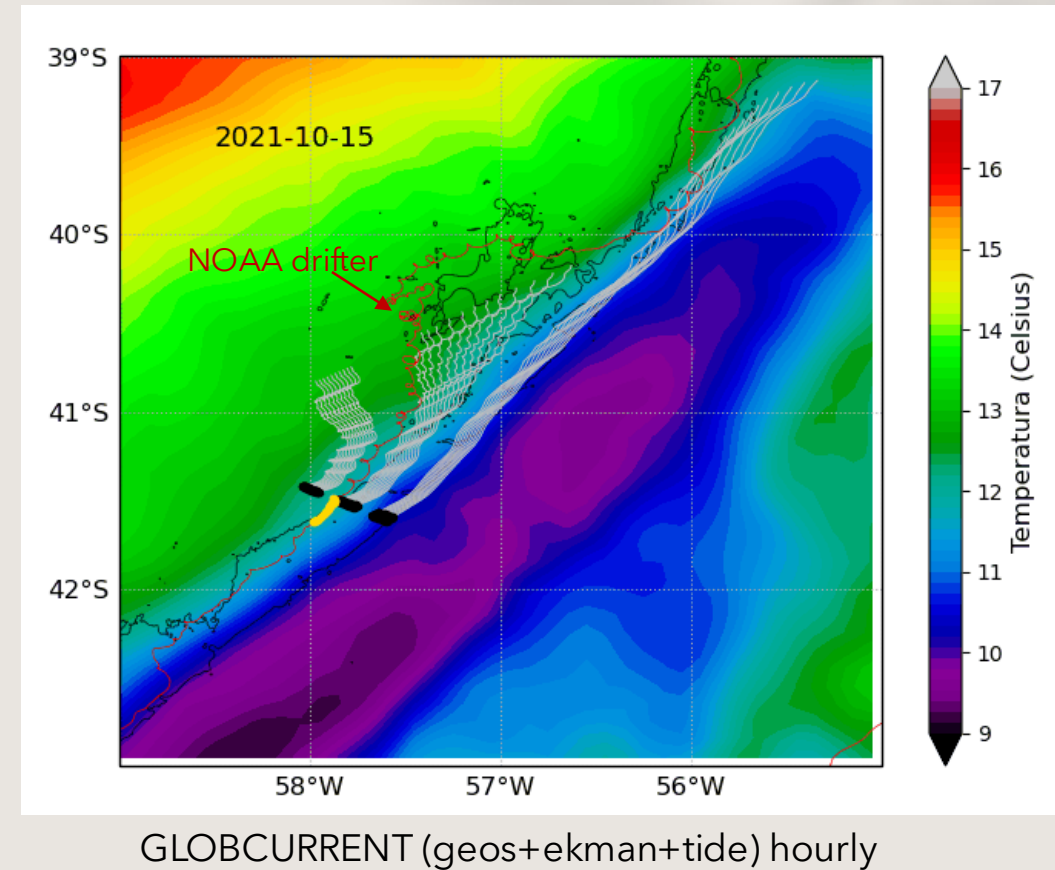
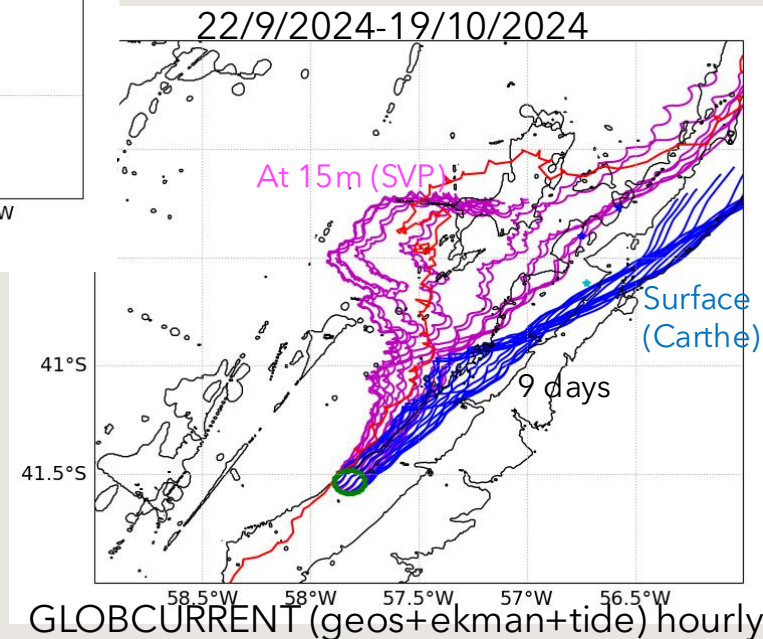
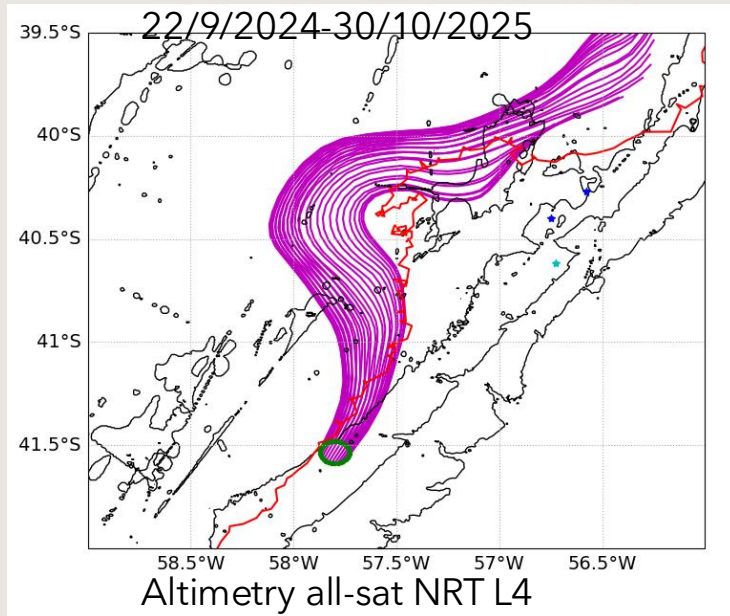
**WP2: Submesoscale structures; WP3: Shelf/Open ocean exchange
WP6: Phytoplankton and nutrients in Lagrangian drifter experiments**

More than a year of preparation



**WP2: Submesoscale structures; WP3: Shelf/Open ocean exchange
WP6: Phytoplankton and nutrients in Lagrangian drifter experiments**

Design of the Lagrangean experiment



**WP2: Submesoscale structures; WP3: Shelf/Open ocean exchange
WP6: Phytoplankton and nutrients in Lagrangian drifter experiments**

The cruise on board Falkor (too) started the 2 of October and will finish the 29 of October

Physics team



M. Martinez



M. Saraceno



S. Cornejo-Guzmán

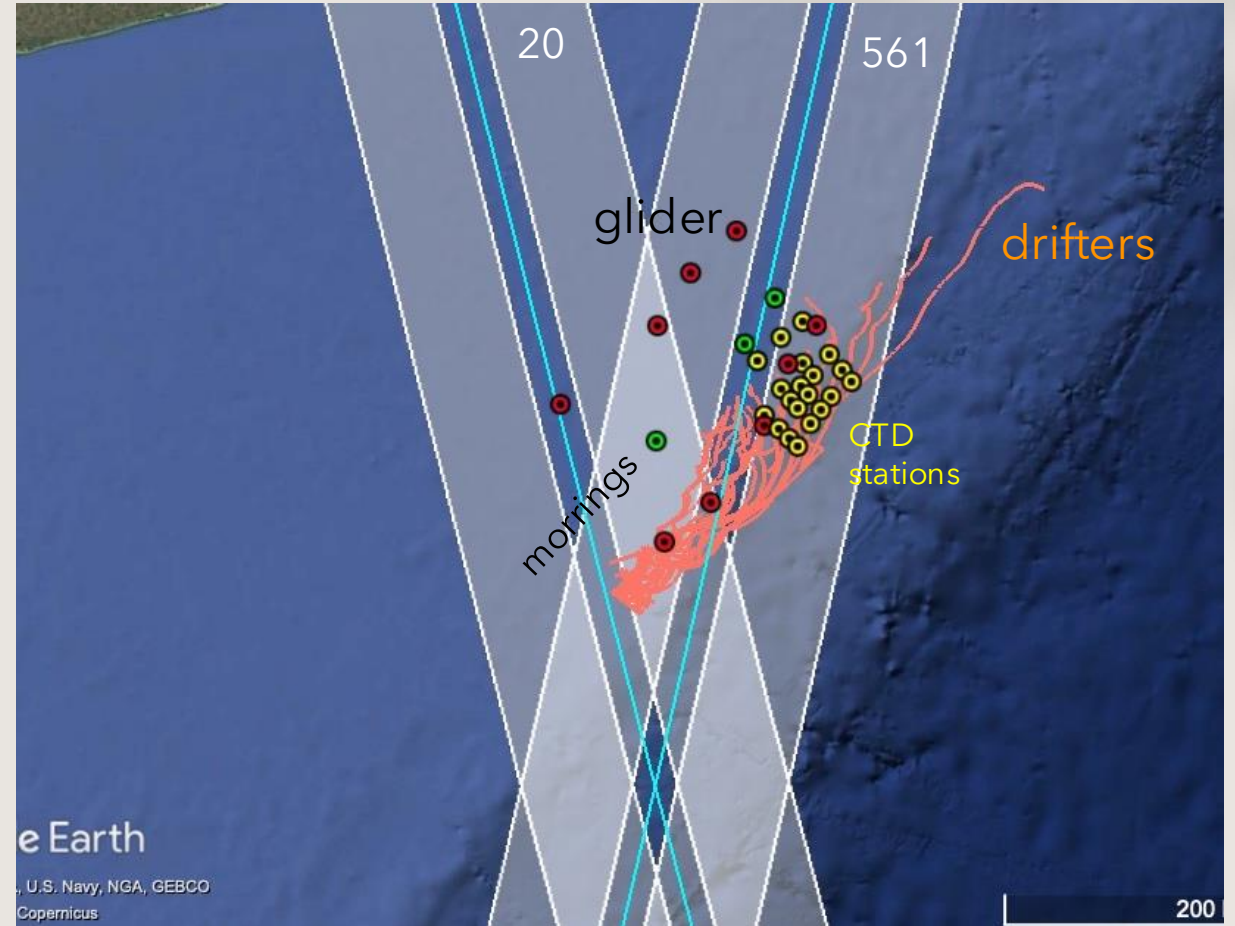
Biology team



V. Guinder



M. Rivarossa



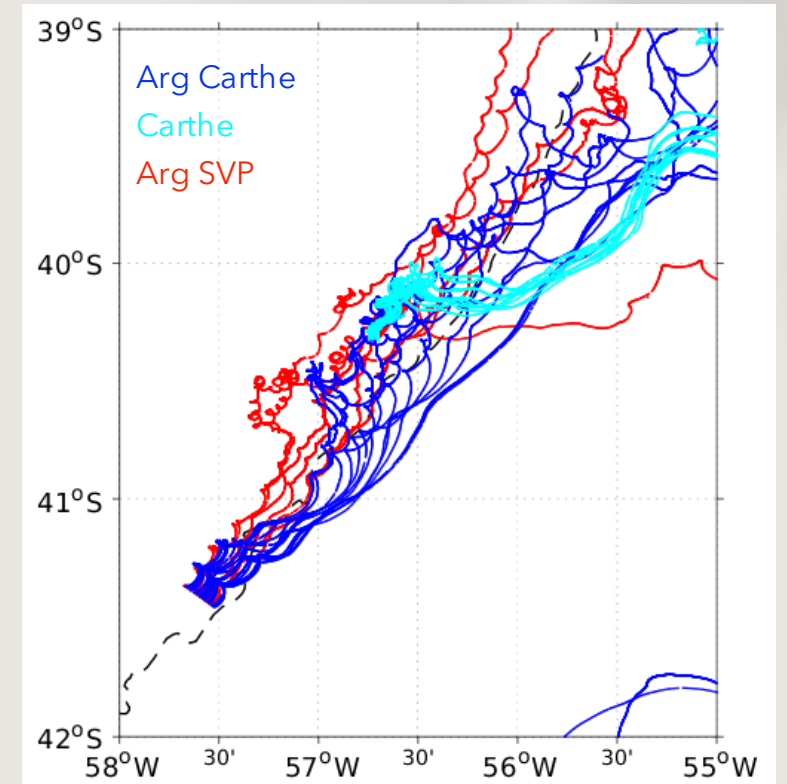
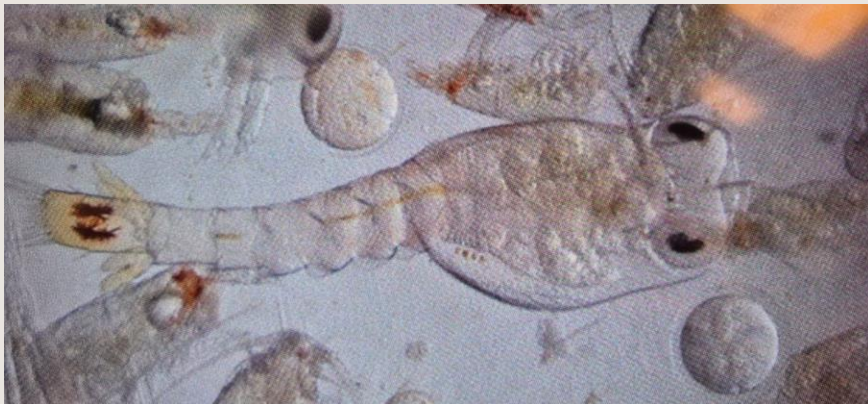
Final remarks and perspectives



The Patagonian shelf has a complex dynamics: regional modeling for geophysical corrections.

The physical and biological data that is collected at this moment is promising.

Analysis of the glider and drifters data will be compared with traditional altimetry and SWOT.



Thank you for your attention
Questions?

lruiz@cima.fcen.uba.ar