

Studying physical processes in the Southwestern Atlantic to understand BIOlogical productivity & regional ecosystems (SABIO)

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Summary

The main objective of **SABIO** is to improve our understanding of the physical processes in the Southwestern Atlantic that impact the biological productivity and the regional ecosystems through the use of satellite altimetry, in-situ and model output data. The objective is motivated by the following questions: (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) acts more as a blender or as a barrier between open ocean and shelf waters? (Q3) How the different trophic levels (phytoplankton, intermediate trophic levels, elephant seal prey) are structured within the water column according to the oceanographic conditions associated with the foraging habitat (Patagonian shelf, Patagonian upper slope, and oceanic water beyond the MC) targeted by southern elephant seals? To provide the data necessary to answer these questions it is proposed to provide supplementary funds to extend the observational capacities of two on-going field experiments. The first experiment will collect in-situ physical (temperature, pressure, salinity, currents) and biological (fluorescence) data through six fixed moorings to be deployed in the Patagonian shelf under the 1-day repeat orbit of SWOT. The second experiment is also measuring physical (temperature, pressure, salinity, wind) and biological (light and acceleration that are used as a proxy of phytoplankton and prey catch attempt rates) variables at the same time but through elephant seals that depart from Peninsula Valdez (Argentina) and visit the Southwestern Atlantic. It is proposed to add oxygen and precise GPS location to the elephant-sea borne instruments. Taking advantage of the in-situ dataset to be collected, the project also proposes to answer the following two questions that are complementary to the main objective indicated above: (Q4) What is the contribution of the steric height effect to sea level variability in the Southwestern Atlantic at intra-seasonal scales? (Q5) What are the state-space topologies of the dynamical systems that characterize the Southwestern Atlantic?