

Towards Operative Sea Surface Height Measurements for Climate and Research Studies in the Southwestern Atlantic (TOSTO)

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Summary

The main objective of **TOSTO** is to improve our understanding of the physical processes that impact the Sea Surface Height (SSH) and derived variables in the Southwestern Atlantic (SWA). Since the advent of the satellite altimetry measurements, the knowledge of the process that impact SSH has increased considerably, particularly in the open ocean. In margin seas and coastal areas, this knowledge has been delayed for several reasons. In situ data are essential to allow a proper interpretation of satellite altimetry data and test different geophysical corrections that are applied to the remote sensed SSH. In the Argentine Continental Shelf (ACS) previous results suggest that there is still need for improvements in the geophysical corrections applied to the SSH to capture the sub-annual variability observed with in situ data. Thus, the main objective of this project is to gain a better understanding of the physical process that drive SSH variability in the SWA. Specific objectives are: (i) cal/val satellite SSH products in the Patagonian shelf, with special emphasis in the new SWOT dataset; (ii) understand the physical process that are responsible of the large biological activity observed over the Patagonian shelf and slope and (iii) describe 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 Malvinas Current (MC)) targeted by southern elephant seals. To provide the data necessary to afford the three

specific objectives of the project, it is proposed to provide supplementary funds to start a new field experiment and to continue an on-going one. The new experiment will be conducted with the logistical support of TOTAL-Energy Argentina (see annex A). Measures of currents and SSH will be collected from a mooring that will be deployed nearby an offshore platform and from a tide-gauge that will be installed in one of the platforms. The second experiment will rely on the collection, at the same time, of GPS located high resolution physical (temperature, pressure, salinity, wind) and biological (light attenuation is used as a proxy of phytoplankton concentration and acceleration allows to estimate prey catch attempt rates) profiles through elephant seals that depart from Peninsula Valdez (Argentina) and visit the Southwestern Atlantic. The elephant seals data analysis and field effort were part of the SABIO OSTST project that is ending in December 2024.