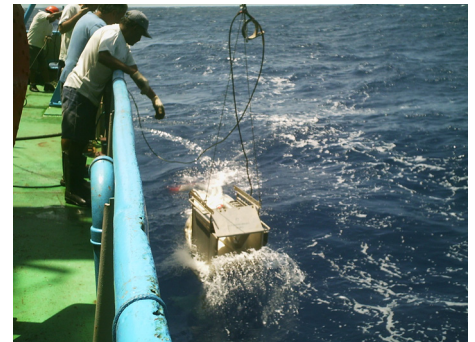




INTER-AMERICAN INSTITUTE FOR GLOBAL CHANGE RESEARCH

SACC: An international consortium for the study of ocean related global and climate changes in South America (SGP-CRA 2076)

Oceans play a significant role in the global climate system; they sequester greenhouse gases, move heat from the equator to polar regions and control the global hydrology. The global Oceans, especially their continental shelves, have soaked up one third of the man-made CO₂ emissions since the mid 1800s. Oceanic phytoplankton produces half of the Earth's chlorophyll, and half of this is found on continental shelves which occupy only 9% of the global ocean area. Researchers in this project are studying exchange processes between the deep ocean and the continental shelf of eastern South America, and how such exchange impacts on the success of shelf species. Our hypothesis is that most of the shelf water transfer to the deep ocean occurs along the Subtropical Shelf Front (STSF, see image at right). Direct observation, historical data and numerical simulations all contribute to understanding ocean circulation and the responses of the ocean biota.



Multilevel plankton net

Goal

- To determine the mechanisms responsible for the export of shelf waters to the deep ocean and its biological and biogeochemical implications.

Specific objectives

- Determine whether the STSF is a preferential site for shelf/deep ocean exchanges.
- Determine the changes of the physical, biological and biogeochemical characteristics of shelf waters along the STSF and their short-term variability.

First results

- The Patagonia shelf, which covers 4% of the global continental margins, absorbs about 17 Tg C yr⁻¹ (million metric tons of carbon per year). The project contributes to a better understanding of the carbon sequestration processes.
- The significant fishery on the shelf break, with about one million tons of fish and squid landed every year (~1.5% of global production) shows strong interannual fluctuations; the project contributes to understand the variability of the commercial resources.
- Development of state of the art ocean models that display realistic features of the circulation and reveal upwelling mechanisms which sustain the productive shelf break region.
- Freshwater input from the Rio de la Plata and Patos Lagoon plays an important role on the ecosystem production and regional diversity in the SW Atlantic.



Data acquisition laboratory on board

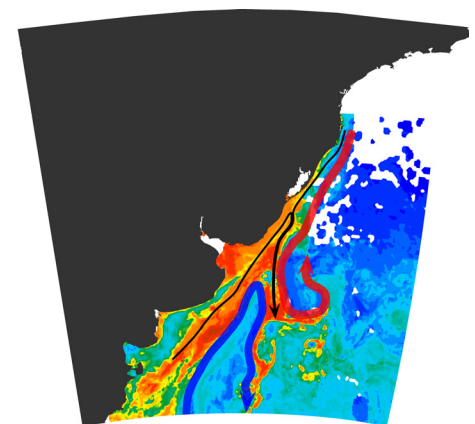
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Project web page: <http://sacc.coas.oregonstate.edu/~sacc/index.php>



Modis Aqua derived chlorophyll-a surface distribution and schematic circulation. The black lines indicate the mean shelf flow and the blue and red lines the Malvinas and Brazil Currents, respectively.

