



INTER-AMERICAN INSTITUTE FOR GLOBAL CHANGE RESEARCH

SACC: An international consortium for the study of ocean related global and climate changes in South America (CRN2076)

Oceans play a huge role in the global climate system; they sequester greenhouse gases, move heat from the equator to polar regions and control the global hydrology. Oceans, especially their continental margins, have soaked up half 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 ocean area. Researchers in this project are studying exchange processes between the deep ocean and the Patagonian shelf, and how these vary in time. Direct observation, historical data and modifications to earth system models all contribute to understanding ocean circulations and ocean biota.

Goals

- Identify the physics, and the currents and tides that control physical and biogeochemical exchanges (species, nutrients, CO₂, sediments) between the deep ocean and the continental shelf, and their variability
- Determine the influence of currents and inflows on the production and biodiversity of the marine environment
- Improve understanding of the dynamic processes controlling upwelling and cross-shelf exchanges for the development of better global carbon models

First results

- The Patagonia shelf, which covers 4% of the global continental margins, absorbs about 1.7 Tg C yr⁻¹ (million metric tons of carbon per year).
- The important fishery on the shelf break, with about two million tons of fish and squid landed every year (3% of global production) shows signs of overfishing, indicated by growing jellyfish populations. This is important to monitor and manage since overfishing could affect plankton and alter the capture CO₂ through photosynthesis.
- The project contributes to developing state-of-the-art ocean models that more realistically represent the circulation and upwelling mechanisms which sustain the productivity of the shelf break.
- Freshwater input from the Rio de la Plata and Patos Lagoon is important for ecosystem production and diversity in the Southwest Atlantic.
- CRN2076 and various Argentinean institutions maintain BioMare, an integrated fishery and oceanographic information system to support fishery policies. BioMare developers expect to expand the system beyond Argentina.

Principal investigator and lead agency

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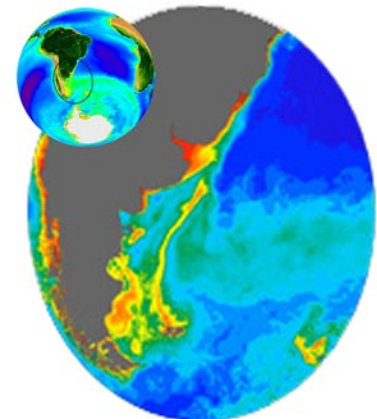
Links to other IAI projects

Research in this project is complemented by the *Human Dimensions* component **2076-HD on artisanal fisheries in the Patos Lagoon**

Project web page: <http://www.sacc.org.uy/>

Publications: Atlas of the Patagonian Sea, Species and Spaces: http://www.iai.int/files/communications/publications/scientific/Atlas_del_mar_Patagonico.pdf

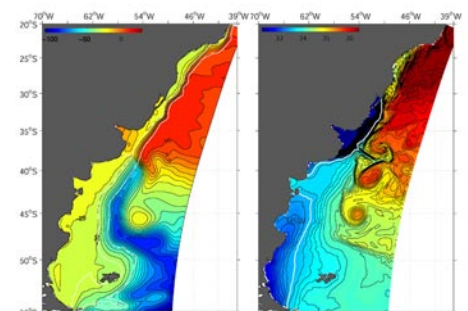
List of publications: http://www.sacc.org.uy/iai_papers.php
<http://iaibr.l.iai.int/bs?publications/CRN2076.pdf>



Satellite derived sea surface chlorophyll distribution in the Southwest South Atlantic in January (values range from 0 mg / m³ (blue) to 20 mg / m³ (red))



Deployment of a Conductivity-Temperature-Depth profiler in the western South Atlantic



Sea surface height anomaly (left) and sea surface salinity (right) from a regional high-resolution ocean model

