CLIVAR/CliC/SCAR Southern Ocean Region Panel SORP-11: Sept. 17-18, 2016

National activities report

Country: Brazil
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Receipt of material prior to Sept. 5, 2016 will ensure inclusion in meeting discussion. Receipt of material prior to Oct. 10, 2016 will ensure inclusion in meeting report and contribute to future SORP discussions, as well as input to the SOOS and other CLIVAR/CliC/SCAR activities.

Purpose of material gathered for the SORP: To build an overview of
- observational, modeling, state estimation initiatives relevant to the SORP

(This can include a list of activities, maps showing where work has been done, major international project involvement, etc.)

A. Recent and ongoing activities

Does your country have a national committee tasked with oversight of Southern Ocean climate science?

Yes, the Brazilian Antarctic Program (PROANTAR). The Brazilian Antarctic Plan 2013-2022 can be accessed at http://www.ufrgs.br/inctcriosfera/arquivos/BrazilianActionPlanEnglish.pdf. The plan is split in five main Programmes, with the 3 first programme's activities related with actions in the Southern Ocean: 1 - The role of the cryosphere in the Earth system and its interactions with South America, 2 - Biocomplexity of Antarctic ecosystems, their connections with South America and climate change, 3 - Climate Change and the Southern Ocean, 4 - Geodynamics and geological history of Antarctica and its relations with South America, 5 - Dynamics of the Antarctic upper atmosphere, geospace interactions, and connections with South America.

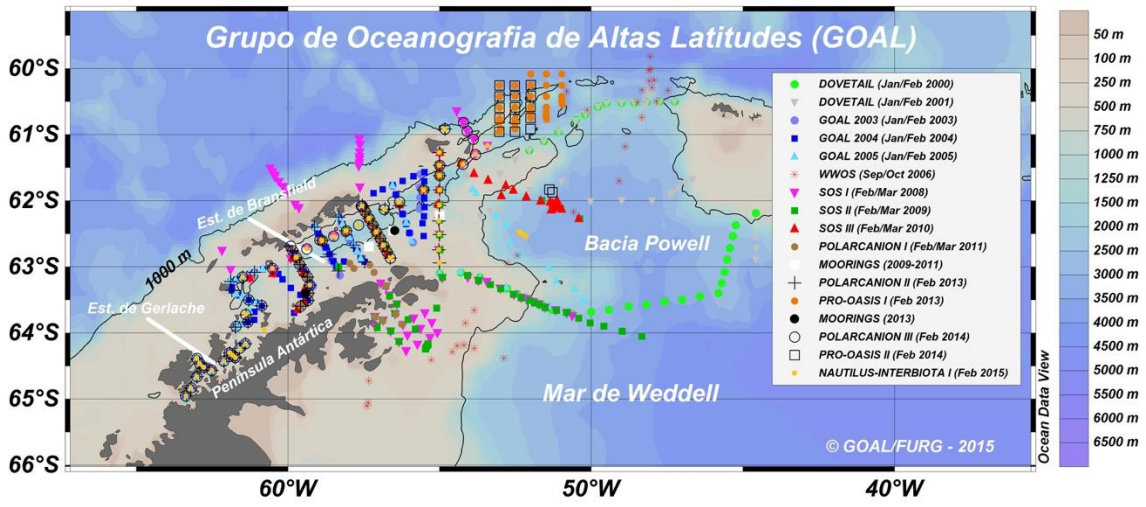
Brazil has also two National Institutes with regular activities in the Southern Ocean. More info regarding these groups can be accessible at:

INCT-CRIOSFERA: http://www.ufrgs.br/inctcriosfera/. PI: Dr. Jefferson Simões (jefferson.simoes@ufrgs.br). The contacts of each subgroup can be seen at: http://www.ufrgs.br/inctcriosfera/contato.html.

INCT-APA: http://www.biologia.ufrj.br/inct-antartico/. PI: Dr. Yocie Valentin (yocie@biologia.ufrj.br). The contacts of each subgroup can be seen at: http://www.biologia.ufrj.br/inct-antartico/contato/.

What major activities have been carried out in the last several years or are in progress now? Contact information for the projects would be useful.

One of the most actively group executing scientific activities in the Southern Ocean is the Brazilian High Latitudes Oceanography Group (GOAL). The GOAL was formed in 2002 within the scope of the Brazilian Antarctic Program (PROANTAR) aiming to contribute to the understanding of the relationship between the marine biota, from microorganisms to top predators of the Southern Ocean food web, and the physical-chemical environment. The understanding of those relationships is crucial to assess the effect of global climate change on the unique and sensitive Southern Ocean ecosystems. Despite the inherent difficulties to work in remote and harsh environments such as the Southern Ocean and the Antarctic margin, we conducted long-term, systematic and integrated studies of the marine ecosystem since the beginning of GOAL. Eleven oceanographic cruises (spanning from 2003-2005; 2008-2011 and 2013-2016) were performed around the Northern Antarctic Peninsula (NAP), which includes the Bransfield and Gerlache Straits, the Powell Basin, and the Northwestern Weddell Sea continental shelf and slope. Even longer-term surveys have been continuously conducted with respect to marine mammals ecology and abundance (since the 1997/98 austral summer). Please see below a map with the cruises performed (mostly during the summer – January or February) by the group in the last years (updated until 2015).



The main projects in progress of the GOAL group were: NAUTILUS (PIs: Dr. Mauricio Mata – mauricio.mata@furg.br, responsible for Physical Oceanography, and Rodrigo Kerr – rodrigokerr@furg.br, responsible for Marine Biogeochemistry and Air-Sea Interactions), INTERBIOTA (PIs: Dr. Eduardo Secchi – edu.secchi@furg.br, responsible for the area of Ecosystem Integration and Top Predators, and Dr. Carlos Rafael Mendes – crbmendes@gmail.com, responsible for Plankton), and BALEIAS (PI: Dr. Luciano Dalla Rosa – l.dalla@furg.br, responsible for Marine Mammals).

A Special Issue in the journal Deep-Sea Research II, entitled: "*Oceanographic processes and biological responses around Northern Antarctic Peninsula (NAP): a 15-year*

contribution of the Brazilian High Latitudes Oceanographic Group", was planned to celebrate the 15 years of GOAL. The manuscript submission process has recently started and will be open until 1st May 2017. The expected publication date of the Special Issue is January 2018.

1. Observational

GOAL normally executed and measure in its cruises: Hydrography – T, S, Oxygen, Fluorescence, Bean Attenuation, Phytoplankton pigments, Nutrients. Recently, has started to measure the carbon parameters: AT/CT, pH, continuous pCO2, and POC/DOC/TOC, Microbiology, continuous CPR lines.

2. Modeling

Contact for specific information about Southern Ocean modeling is Dr. Ilana Wainer – wainer@usp.br.

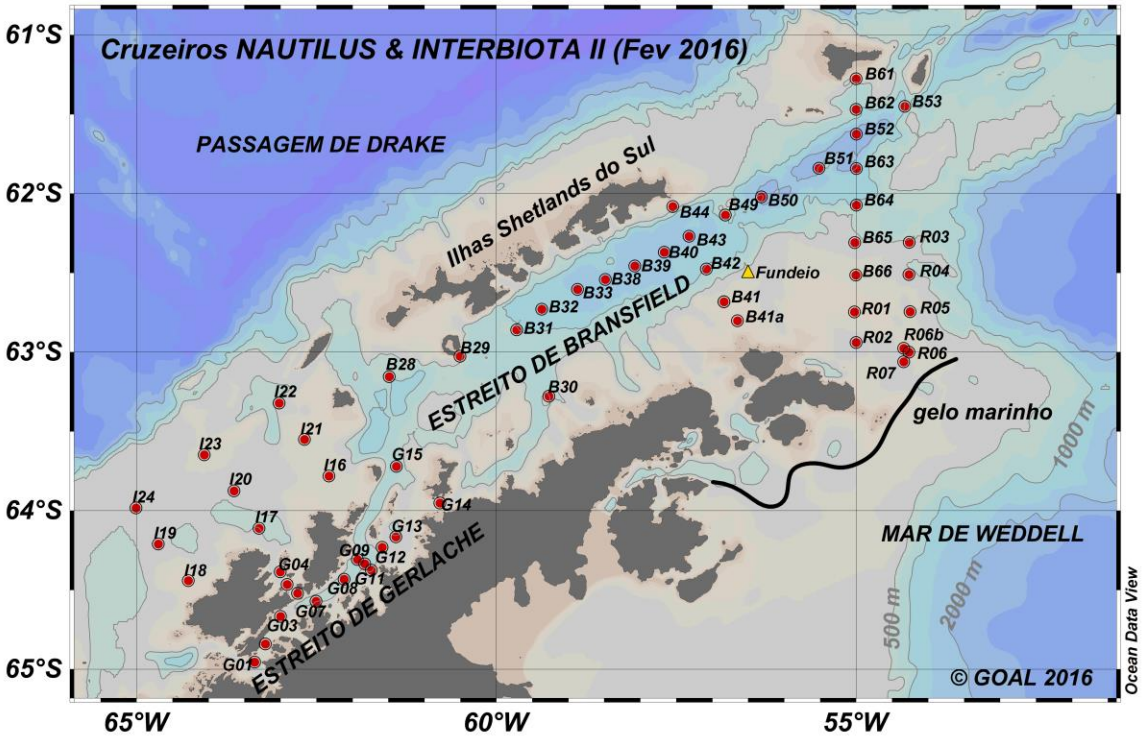
3. State estimation

None being done and none planned

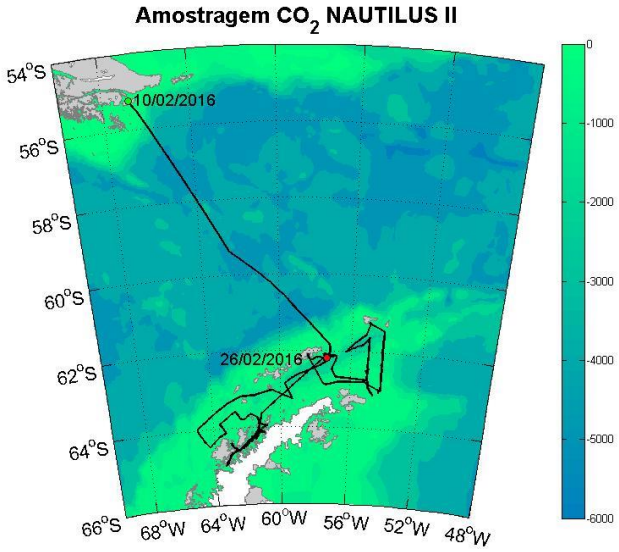
B. Planned activities

What major activities are planned or likely to occur during the next several years? Contact information for the projects would be useful.

In the summer of the next year we have already scheduled the NAUTILUS/INTERBIOTA cruise III (February 2017). The plan is to reoccupy the hydrographic stations of the last cruise (February 2016), see the map below, and to perform again the continuous pCO2 and CPR lines.



CTD hydrographic stations performed during the NAUTILUS/INTERBIOTA cruise II in February 2016.



The continuous pCO2 line executed during February 2016. CPR lines were executed crossing the Drake Passage, the Bransfield Strait and the Gerlache Strait.

SORP terms of reference http://www.clivar.org/clivar-panels/southern

"To serve as a forum for the discussion and communication of scientific advances in the understanding of climate variability and change in the Southern Ocean. To advise CLIVAR, CliC, and SCAR on progress, achievements, new opportunities and impediments in internationally-coordinated Southern Ocean research."

Specific Activities:

1. Facilitate progress in the development of tools and methods required to assess climate variability, climate change and climate predictability of the ocean-atmosphere-ice system in the Southern Ocean.
2. Identify opportunities and coordinated strategies to implement these methods, spanning observations, models, experiments, and process studies.
3. Provide scientific and technical input into international research coordination, collaborating as required with other relevant programs, including the Southern Ocean Observing System (SOOS).
4. Monitor and evaluate progress in Southern Ocean research, and identify gaps.
5. Enhance interaction between the meteorology, oceanography, cryosphere, geology, biogeochemistry and paleoclimate communities with an interest in the climate of the Southern Ocean.
6. Work with relevant agencies on the standardization, distribution and archiving of Southern Ocean observations.