Climate variability in under sampled regions: The tropical and southern Atlantic

Abstract

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Improved understanding of the coupled ocean-climate system will depend on better knowledge of ocean dynamics and ocean-atmosphere exchanges. This talk will highlight observational results and needs for two historically under sampled regions: the tropical and southern Atlantic Ocean. The first part of the presentation will cover what we have learned so far from the international South Atlantic Meridional Overturning Circulation (SAMOC) initiative, which seeks to both encourage and coordinate AMOC related science in the South Atlantic region. One major observational component of SAMOC is the South Atlantic MOC Basin-wide Array ("SAMBA") along 34.5°S; early analysis of SAMBA data has already demonstrated that the AMOC is equally as strong and variable at 34.5°S as it is at 26.5°N. This presentation will provide an overview of SAMOC related advancements with a particular focus on the growth of SAMBA on both boundaries, the science already being produced from the arrays, and the plans to further instrument the trans-basin mooring line on the boundaries and the interior along 34.5°S.

The second part of the presentation is a brief description of ongoing multi-national efforts to improve our knowledge and understanding of coupled ocean-atmosphere variability in the tropical Atlantic. Since the late 1990s, several major field programs have been initiated to monitor the circulation, hydrography, and air-sea fluxes in the equatorial Atlantic with moored arrays, cross-equatorial cruises, and satellite-tracked drifting buoys and Argo floats deployed during those cruises. With these measurements much has been learned about the mean cross-equatorial structure and seasonal-to-interannual variability of currents, temperature, salinity, and dissolved oxygen in the upper water column in the central and eastern equatorial Atlantic. Plans to further augment the ocean-atmosphere observational network by the PIRATA (Prediction and Research moored Array in the Tropical Atlantic) research community will be highlighted.