

Variability of the South Atlantic Subtropical Gyre

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The objective of this NASA-funded project, which began in May 2014, is to improve our understanding of the South Atlantic (SAtl) subtropical gyre and its connection to the Atlantic Meridional Overturning Circulation (AMOC). The rate at which heat is transported northward versus stored by the SAtl subtropical gyre is of great importance, as the gyre plays a significant role in the establishment of oceanic teleconnections, and changes occurring in the South Atlantic alter the AMOC. As part of this study, the time-variability of the SAtl subtropical gyre will be investigated through analysis and interpretation of satellite and *in situ* data, synthesis products, OFES (ocean general circulation model for the Earth simulator) ocean-only model simulations, and state-of-the-art eddy-permitting and eddy-resolving NOAA/GFDL coupled climate simulations.

The overall goals of this project are two-fold: a) to describe the evolution of the SAtl subtropical gyre over the past two decades in the surface and intermediate waters; and b) to improve our understanding of the mechanisms that control the variability of the SAtl subtropical gyre - and the currents that delineate the boundaries of the gyre - on interannual to decadal timescales. Specifically, we will characterize the time-mean and time-varying components of the Brazil Current, South Atlantic Current, Benguela Current, Agulhas leakage, and South Equatorial Current, and ascertain whether the primary mechanisms and sources responsible for the variability of each of those currents are the same as the mechanisms that govern the gyre variability.