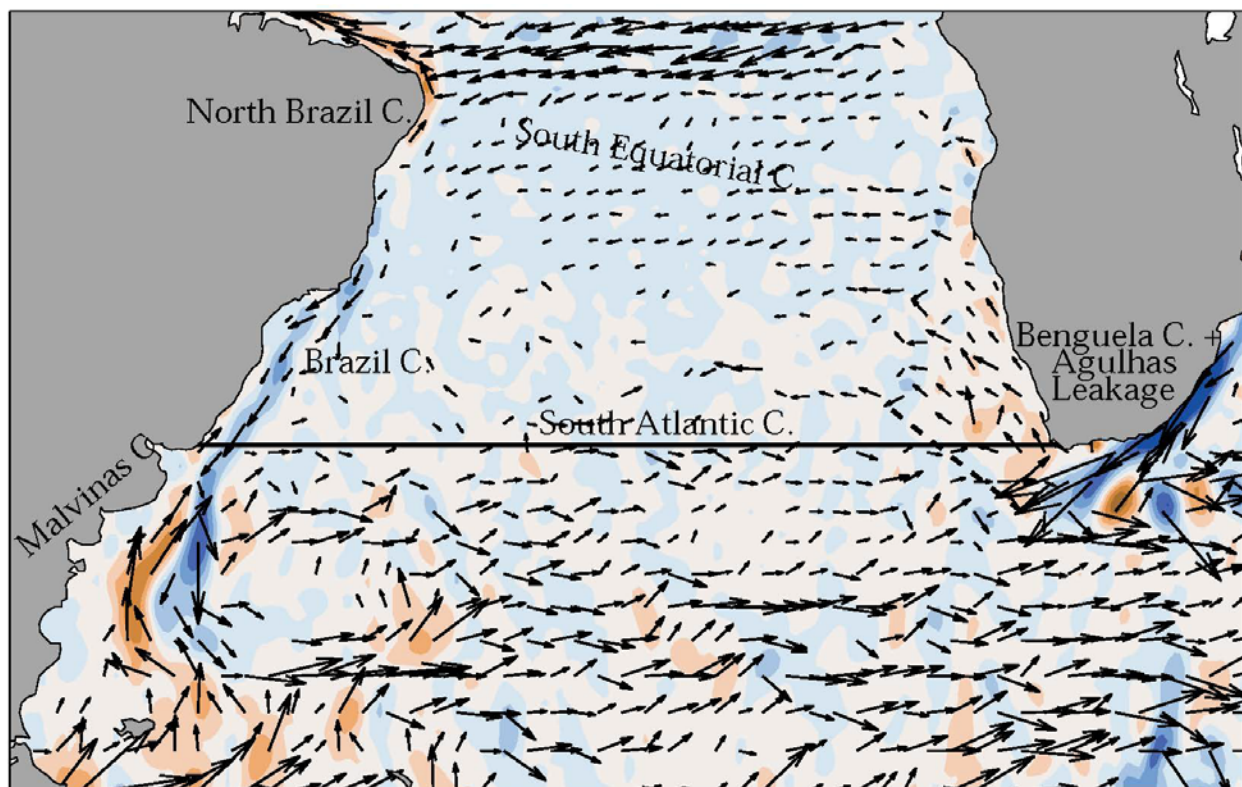


Variability of the South Atlantic Subtropical Gyre

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The rate at which heat is transported northward vs. stored by the South Atlantic (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 Atlantic Meridional Overturning Circulation (AMOC). As part of this study, the time-variability of the SATl subtropical gyre through analysis and interpretation of satellite and in situ data, synthesis products, and ocean-only and coupled climate models will be investigated. 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. This work is done in collaboration with Rym Msadek (CERFACS, France) and Ricardo Matano (OSU/CEOAS).



Map of mean near-surface (15-m) currents delineating the boundaries of the South Atlantic subtropical gyre from the Lumpkin and Garzoli (2011) drifter-altimetry synthesis product. Color shading: meridional currents (blue indicates southward and brown indicates northward). Vectors show horizontal currents with magnitudes in excess of 10 cm/sec. Labels indicate major circulation features.