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Role of salinity and temperature on the North Brazil Undercurrent

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North Brazil Undercurrent is a western boundary current in the tropical South Atlantic Ocean. It is generally located between 11S and 5S, and it forms as the South Equatorial Current encounters the coast of northern Brazil. It carries a large volume of water and heat and plays an important role in the Atlantic Meridional Overturning Circulation and the South Atlantic Subtropical cycle. We have used three high-resolution and one low-resolution model outputs to explore the linear trend of NBUC transport and its variability on annual and interannual time scales. We find that the linear trend and interannual variability of the geostrophic NBUC transport show large discrepancies among the datasets. Thus, the linear trend and variability of the geostrophic NBUC are associated with the model configuration. We also find that the relative contributions of salinity and temperature gradients to the geostrophic shear of the NBUC are not model-dependent. Salinity-based and temperature-based geostrophic NBUC transports tend to be opposite-signed on all time scales. Despite the limited salinity and temperature profiles, the model results are consistent with the in-situ observations on the annual cycle and interannual time scales. We have highlighted the equally important roles of temperature and salinity in driving the variability of NBUC transport.