

## **The Antarctic Circumpolar Current during the Last Glacial Maximum**

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The circulation and climate of the modern Southern Ocean is dominated by the Antarctic Circumpolar Current (ACC) and associated frontal structures that separate the cold, nutrient-rich Antarctic water masses from the subantarctic and subtropical waters of northern basins. The structure in seawater density across the ACC puts strong constraints on the intensity of the eastward flow. Here we investigate the density structure across the ACC during the Last Glacial Maximum (LGM). We explore the relationship between the lateral density contrast across the ACC and the vertical density stratification north of the ACC in General Circulation Models (GCMs). We employ a compilation of paleoceanographic constraints from the literature, including the oxygen isotopic composition of benthic foraminifera and the chlorinity and oxygen isotopic composition of pore waters in order to reconstruct these vertical and lateral density contrasts south of Australia during the LGM. We find that the density contrast across the ACC is similar to today's. While some model simulations produce a density stratification and ACC much stronger than today's during the LGM, we find the bulk of the paleoceanographic data do not support such a scenario.