

Investigating circulation changes on the southwestern Antarctic Peninsula from the Gomez ice core

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We present results from a new medium depth (136 metres) ice core drilled in a high accumulation site (73.59°S, 70.36°W) known as Gomez, on the south-western Antarctic Peninsula during 2007. The Gomez record reveals a doubling of snowfall since the 1850s, with acceleration in recent decades. Comparison with published accumulation records indicates that this rapid increase is the largest observed across the region. Evaluation of the relationships between Gomez accumulation and the primary modes of atmospheric circulation variability reveals a strong, temporally stable and positive relationship with the Southern Annular Mode (SAM). Furthermore, the SAM is demonstrated to be a primary factor governing decadal variability of accumulation at the core site however, the association with ENSO is complex: while sometimes statistically significant, the relationship is not temporally stable. Thus, at decadal scales we can utilise the Gomez accumulation as a suitable proxy for SAM variability but not for ENSO. These initial studies reveal that the Gomez site is sensitive to hemispheric-scale circulation patterns and thus we will present additional chemistry and isotope data from the new ice core to investigate the sub-seasonal relationships with the SAM.