



Decadal climate variability in the sub-Antarctic islands

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The sub-Antarctic islands (SAI) are uniquely located to capture changes in the globally significant circumpolar westerly winds and the Antarctic circumpolar current, key to the mixing and ventilation of the world's deep oceans. Here we present the first results from seven new shallow (10-20 m) ice cores, collected from a number of the glaciated SAI's, as part of the Antarctic Circumnavigation Expedition (ACE). These include the first ever records from Bouvet Island, Peter 1st Island and the Balleny Islands, providing much needed climate information from this data sparse region. We investigate the sub-annual to decadal variability in stable water isotopes, melt histories and major ion chemistry spanning the past 20-30 years. We use back-trajectory analysis to determine the source regions and transport pathways of air masses reaching the SAI's. Reanalysis data and satellite observations confirm that the records contain valuable information about regional climate, atmospheric circulation and sea ice during the observational period, suggesting that longer climate records from a number of the SAI's is achievable.