Abstract ID : **236**

Southern African precipitation signals preserved in Antarctic ice cores

Content

Southern African precipitation is highly variable on inter-annual to decadal timescales, yet the full extent and drivers of this variability are poorly understood. Determining such variability often requires long and reliable observational records in combination with paleoclimate reconstructions. Observational records in southern Africa tend to be sparser and shorter compared to Southern Hemisphere counterparts in Australia and South America. Moreover, few long-term (multi-centennial to millennial) annually resolved precipitation reconstructions exist for southern Africa. This is due to limited local paleoclimate archives, for example, there are very few long-lived tree species that produce reliable annual growth rings in southern Africa. Long-lived coral species that preserve annual luminance bands off the Madagascan coast exist, however, these do not preserve strong precipitation signals for the southern African mainland. As a result, existing precipitation reconstructions are based on historical documents (e.g., newspapers, journal articles, diaries, and ship logbooks), tend to be semi-quantitative, and span only one-to-three centuries. Given the limited local paleoclimate archives in southern Africa that are multi-centennial and annually resolved, archives remote to the African mainland may be the only source of this information.

Remote archives are not located in the region of interest but are climatologically linked through large-scale oceanic and atmospheric circulation. Although Antarctic ice core records are generally used to reconstruct hemispheric and global climate, they can also be used to reconstruct regional climate. To date, there have been no published signals of southern African precipitation preserved in Antarctic ice cores. Here, we use new (Mount Brown South site) and existing annually resolved ice cores to search for southern Africa precipitation signals. Our results show that multiple ice cores are significantly correlated with station records from southern Africa over the 20th century. We present the preliminary analysis of how these signals are preserved and linked to large scale regional circulation. We suggest that southern African precipitation can be reconstructed over the recent millennium using ice core records. Such reconstructions would aid in determining the full extent and drivers of inter-annual and decadal precipitation variability, and thereby enhance the reliability of future projections. This will allow for better management plans that mitigate the environmental and societal impacts of extreme hydrological events (floods and droughts).

Primary authors: CROCKART, Camilla (University of Tasmania); Dr FRASER, Alexander (University of Tasmania, the Australian Antarctic Program Partnership); Prof. ABRAM, Nerilie (Australian National University); Dr FIDDES, Sonya (University of Tasmania, the Australian Antarctic Program Partnership); Dr KLEKOCIUK, Andrew (Australian Antarctic Division); Dr VANCE, Tessa (University of Tasmania, the Australian Antarctic Program Partnership)

Presenter: CROCKART, Camilla (University of Tasmania)

Track Classification: Holocene and last 2000 year climate forcings and variability