



## **ENSO flavours during the pre-instrumental period**

Mandy Freund, Benjamin Henley, and David Karoly

School of Earth Sciences and ARC Centre of Excellence for Climate System Science, The University of Melbourne, Melbourne, Australia (mfreund@student.unimelb.edu.au)

El Niño-Southern Oscillation (ENSO) is the largest driver of interannual variability in the global climate system. Recent studies have identified major changes in the frequency and intensity of ENSO events. Under greenhouse warming scenarios an increase in frequency of extreme El Niño and La Niña events is projected. Recent work has identified different ‘flavours’ of ENSO, for example, classical cold-tongue ENSO events and non-conventional El Niño definitions like the Central Pacific, Modoki and warm pool El Niño events. A critical question is to understand the dynamical aspects of the variety of ENSO events in a changing climate prior to the instrumental period.

We present the first sub-seasonally resolved reconstruction of El Niño Southern Oscillation (ENSO) events based on a multi-century seasonally-resolved network of tropical coral records.

The comparison with instrumental observations and existing ENSO reconstructions exhibits high agreement on inter-annual timescales and highlights the merit of seasonally-resolved proxies in studying ENSO dynamics.

The reconstructions are used to explore seasonal to multi-decadal time scale variability and trends in frequency, duration and propagation direction of ENSO events.