



300 Years of Decadal Sea Surface Temperature and Salinity Variability in the Coral Sea

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The Interdecadal Pacific Oscillation (IPO) represents a recurrent pattern of surface temperature variability over the Pacific Ocean, with the most recent and best documented change occurring in 1976. This shift supposed a major oceanic and atmospheric reorganization that induced climatic and biological changes and was characterized by an increase in tropical ocean temperatures and the development of more frequent and stronger El Niño versus la Niña events. In the Southwest Pacific, the IPO is known to modulate Australia's climate, in particular the impact of ENSO events on decadal timescales: when the IPO is negative (tropical Pacific cooler than average), teleconnections between ENSO events and Australia's rainfall and temperature are strong, whereas this relationship barely exists during the positive phase of IPO. We will present 280-year coral records from an offshore reef on the Queensland Plateau (western Coral Sea) which shows decadal variability in sea surface temperature (SST) and salinity. Low resolution (5-year intervals) Sr/Ca and $\delta^{18}\text{O}$ analyses, going back to 1710 AD, show a good correlation between negative IPO values and low salinities, associated with increased precipitation at these times (enhanced and more frequent La Niña events). The decadal variability observed in our salinity record is closely followed by changes in SSTs, with cooler temperatures recorded during wet periods. This would correspond to a negative IPO phase when enhanced and more La Niña events would bring more precipitation and cooler temperatures to Australia