



Assessment of indices of interannual and interdecadal variability in the equatorial Pacific

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The equatorial Pacific is vast and few long monthly records of climate variability exist. One record is the more than 150 year long estimate of the sea surface temperature (SST) index NINO3.4, based on the analysis by Kaplan et al. (1998). Another, since 1882, is the Tahiti minus Darwin Southern Oscillation Index (SOI) and a third is the δO_{18} coral proxy of NINO3.4 SST from Palmyra (Cobb et al. 2003). These records are closely related physically and therefore should be highly correlated. Decadal and longer variability of NINO3.4 and SOI indices agrees well after 1950 ($r=0.92$), but not before 1950 ($r=0.12$). The coral record, which does not care about imprecise measurements before 1950, shows that both the NINO3.4 and the SOI decadal indices may be in error before 1950 because both individually are well correlated with the coral after 1950, and less well correlated before 1950. We have used an improved SST data set (Rayner et al. 2005) together with night time air temperature data and an equatorial SOI to establish an improved NINO3.4 estimate before 1950.