



ENSO Variability in current changing climate using SODA : 1871-2008

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ENSO, the dominant form of climate variability in the tropical Pacific, has considerable impact on climate throughout the globe. Thus understanding global climate change requires an understanding of the low frequency behavior of ENSO. An ocean reanalysis that spans the period from 1871-2008 is used to explore changes in ENSO strength, frequency and location. The new reanalysis is based on the SODA methodology and uses surface momentum fluxes from a recently completed atmospheric reanalysis (20CRv2) that also spans the period from 1871-2008. SODA uses all available hydrographic data from WOD09 and sea surface temperature (SST) data from ICOADS 2.5, but does not use satellite data. A new index CHI (Center of Heat Index) based on the first moment of the anomalous heat distribution over the equatorial Pacific is used to measure El Niño events. We focus on two important metrics for El Niño, the amplitude (or strength) of an event and the location of the event. The results indicate there is considerable decadal variability in the strength of events, with strong El Niño events at the beginning and end of the 20th Century but relatively weak El Niño events during the middle of the 20th Century. Although the reanalysis shows prominent decadal variability in El Niño strength, there is no apparent long-term trend in El Niño strength. The reanalysis also shows that the center of heating during an El Niño can vary considerably from the east Pacific to the central/west Pacific, however there is no clear indication of a trend in the location of El Niño events.