



Using SODA Ensemble Reanalyses to Describe ENSO 1871-2008

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An ensemble of ocean reanalyses that span the period from 1871 to 2008 is used to explore the evolution of El Niño events over the past 140 years. The new reanalyses are based on the SODA methodology and use surface momentum fluxes from a recently completed ensemble of atmospheric reanalyses (20CRv2) that also span the period from 1871-2008. Atmospheric variables from the 20CRv2 runs are also used for the bulk formulae for heat and salt fluxes. Individual ensemble members from the atmosphere are used to force ensemble members for the ocean. The reanalyses use all available hydrographic data from WOD09 and sea surface temperature (SST) data from ICOADS 2.5, but do not use satellite data. 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 reanalyses show prominent decadal variability in El Niño strength, there is no apparent long-term trend in El Niño strength. The reanalyses also show that the center of heating during an El Niño can vary considerably from the east Pacific to the central/west Pacific, however as for amplitude there is no clear indication of a trend in the location of El Niño events.