

Historical chronologies of El Nino events in the light of instrumental data

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Compiling historical chronologies of El Nino events (e.g. by W.Quinn and collaborators and their recent revisions by L.Ortlieb) is highly respected and extremely useful for the development of the ENSO-related research. Nevertheless, the way it is done sometimes resembles more of the qualitative science or even art, than of the hard quantitative science. W.Quinn presents a general scheme of converting the evidence for synchronous sets of El Nino-suggesting factors into a chronology of events occurrence and intensity. He provides references for these factors, but in most cases does not really demonstrate how the intensity was exactly obtained from the evidence. His evidence set represents mostly coastal ocean and land impacts, and some teleconnection factors. They are quite different from the typical ENSO indices, like NINO3 and the SOI, that are used today for diagnosing or prediction of ENSO events. Moreover, Quinn's chronologies do not explicitly use indices of large-scale patterns in sea surface temperature, atmospheric pressure, or any other climatic variables. The rough consistency between Quinn's rating and instrumental indices like NINO3 or SOI is certainly significant, and its imperfection is usually excused on the grounds that "they all measure different things".

In this work we attempt to bring Quinn's ratings, their Ortlieb's corrections, and the evidence on which they are based, into the context of the instrumental data for the last 150 years. For this purpose we use new COADS-based analyses of sea surface temperature, sea level pressure and surface winds, as well as GHCN-based analyses of land air temperature and precipitation. The instrumental data indices show a remarkable cross-variable agreement, particularly good for strong events. We discuss the differences with Quinn's chronologies, Quinn--Ortlieb contradictions, and importance of local vs global manifestations. We discuss in detail "controversial" El Nino events of 1868, 1871, 1907, 1932, and 1943.