



Comparison of 19th century ship log wind data and adjoining land-based Royal Observatory data (1843 to 1855): Spot the difference?

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Historical weather and climate data are essential for the establishment of long-term climate patterns and future projections. For South Africa, where there is a paucity of such long-term climate data, it undermines the ability to establish climate changes and variability over longer periods of the past few centuries. Consequently, analyses of climate change in the region have relied on relatively poor resolution proxy records. Yet, the recently discovered instrumental meteorological records of the Royal Astronomical Observatory in Cape Town provides South Africa's (and possibly the southern hemisphere's) longest continuous time series of daily recorded weather measurements, including temperature, rainfall, barometric pressure and wind (1835 to present). Wind specifically is a reliable indicator of dynamic atmospheric circulation and lends supporting data for understanding the Mediterranean climate of the region. This project has manually digitized, pre-processed and validated wind data from the earliest records by comparing these data with the only other known wind data for that time in the region – namely ship log data. Ship log data, recovered and digitized by the CLIWOC project, are used for statistical correlation (using wavelet query analysis) and trend analysis for the period 1843 to 1855.

Both data sources indicate the same general wind climatological trends. The similarly decreasing trend in average wind velocity over the time period investigated, suggests that the data have been adequately captured and that ship log data are representative of adjoining land-based synoptic conditions. It is hoped that short term cyclic/extreme events can be extracted using a wavelet query analysis by correlating the data at various time steps. Differences in the timing of recordings and spatial scales between data sets present challenges for such a comparison. This work is part of a larger digitization project which is analysing Cape instrumental and documentary weather/climate records between the mid-17th century and the present, in an attempt to construct an annual chronology spanning almost 400 years.