



Evaluation of ENSO controls on the long-range transport of trace gases and aerosols over southern Africa

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As a part of the Southern African Regional Science Initiative (SAFARI 2000), atmospheric chemical measurements were taken over southern Africa during both the high and low phases of the El Niño Southern Oscillation (ENSO). These data indicate that the long-range pathways for trace gas and aerosol transport are dependent on ENSO phase. Westerly transport was observed to be more prevalent during the high phase of ENSO than during the low phase. This climate driven difference was found to be primarily due to differences in frequency and location of synoptic-scale circulations, resulting from Walker cell shifting, and not due to differences in absolute vertical stability. Although vertical stability is a key factor in determining long-transport regimes over southern Africa, it was observed that the mean height of absolutely stable layers did not vary according to ENSO cycling. The combined use of TOMS satellite data sets for ozone and aerosols and SAFARI 2000 observations are presented along with meteorological analysis to explain differences in long-range transport pathways for both high and low phase ENSO years.