



Attributing 2015-2017 drought in Western Cape, South Africa

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The Western Cape region of South Africa has experienced an unprecedented multi-year drought that has impaired the ability of surface reservoir-based water supply system to provide water to 3.5 million residents of Cape Town and regional agriculture. Commonly used multi-method attribution methodology is applied to assesses the role of anthropogenic climate change in exacerbating the severity of that drought. Observational (rainfall) based analyses reveal that risk of drought of magnitude recorded in 2015-2017 has increased by a factor of 3 to 32 compared to pre-industrial period. CMIP5 simulations-based analyses provide change in risk in the lower part of that range. Dedicated attribution experiments with HadAM3P model, however, suggest a non-significant change in risk between the pre-industrial and current climate. In this paper we present these conflicting attribution analyses, and attempt to reconcile them within the current understanding of synoptic drivers of rainfall variability in the winter rainfall region of southern Africa including sub-tropical jet dynamics, southern annular mode, and regional sea surface temperatures.