



Assessing and deriving baselines for water assessment in Victoria, Australia

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The baseline is a period which has been chosen to best represent the current climate of a region and serves two main purposes: 1) it is used as a reference against which recent observations are compared and 2) it can be used as a benchmark to evaluate the looming changes in climate for planning and management processes. Key requirements for a baseline are that it should be of sufficient duration to encompass the range of natural climate variability, but, given that the climate is likely to be changing due to anthropogenically-driven climate change, the baseline should also be of short enough duration so as to represent the current state of the climate, and minimize the chance of any climate shifts within the baseline period. The World Meteorological Organization (WMO) recommends using a period of at least 30 years (e.g. 1981–2010) as a baseline to compute the climatological standard normals, while IPCC has used the 1986–2005 period as a baseline in its Fifth Assessment Report as a reference period in its assessment of climate change.

For rainfall however, several studies have found that 30 years or less is not long enough to adequately represent the range of natural variability, especially when it is used as a predictive indicator of the conditions likely to be experienced in a given location. Victoria, in southern Australia, has just experienced its driest cool season (April – October) rainfall for the last 30 years compared to any 30-year period in the historical record from 1900–2016. Victorian rainfall trends include a known influence from climate change, thus this recent period could be representative of the best baseline to use. However, the projected rainfall reductions for 2030 across the region are smaller than the observed declines over the last decades. Given this discrepancy, do the recent decades represent a true baseline, and a good estimate of the climate going forward, or are they unusually dry? Is any historical period truly representative of the current state of the climate or the expected climatic conditions over the coming decade? These concerns lead to questions about how best to characterize the baseline climate.

This research assesses whether a more robust approach to defining the baseline for the Victorian water sector can be developed. We are analysing baselines over the historical period and for coming years and decades to examine the impact of natural climate variability and anthropogenic forcing on the baselines. We present results on baselines in both the observations and a large number of climate models from around the world.