Victorian Climate Initiative

B. Timbal[a], H.H. Hendon[a], M. Ekstrom[b]

[a] Bureau of Meteorology, Melbourne 3001
[b] CSIRO, Canberra
Email: b.timbal@bom.gov.au

Strategies to ensure the sustainable management of water resources and the provision of secure water supplies for urban and rural water users and the environment are underpinned by assumptions about the current and likely future availability of water resources over a range of time scales (from weeks to decades ahead). The Victorian Climate Initiative (VicCI) was established in 2013 as a three-year program of research to inform the preparation of such strategies for Victoria through improved prediction and understanding of the climate system and its representation by climate models, as well as the linkages between climate and water availability. This strategic knowledge provides the basis for improved projections of future climate and associated water availability in Victoria; in particular, it enhances knowledge of the uncertainties in future projections.

As part of the program first year progress, an attempt was made to develop future streamflow projections using downscaled rainfall calibrated to match catchment-wide observed gridded rainfall on a 5km grid. First a simple statistical model, that uses a linear combination of the current month's precipitation, the previous month's precipitation and the previous 12 months of precipitation to reconstruct the monthly inflow of Melbourne's water catchments, was updated to include the previous 10-years of rainfall as well, and applied across 27 Victorian catchments. The updated model was better able to capture the magnitude of streamflow reductions during the Millennium Drought, and it can be readily applied to provide initial estimates of projected streamflows given projected rainfalls. Secondly, the model has been applied across selected Victorian catchments to generate initial future inflow projections using daily rainfall derived from the analogue-based statistical downscaling of available CMIP5 models. Results from that early attempt to provide streamflow projections suing the latest global climate model based projections will be presented.

In due course, these results will be compared with those from using different downscaling approaches and more sophisticated rainfall – runoff models. In addition, a broader evaluation of some commonly used approaches that provide future climate projections for hydrological modeling (e.g. empirical scaling from global climate models, empirical scaling informed by regional climate models, bias correcting of regional climate model simulations, bias correcting of analogue downscaling) will be performed in order to compare the results with the simple method. The strengths and weaknesses of each method will be assessed, with a view to recommending methods for different applications.

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