Towards an enhanced regional atmospheric reanalysis for Australia

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Abstract

The Bureau of Meteorology is now embarking on developing the next regional ensemble-based atmospheric reanalysis, to improve upon its first deterministic reanalysis – Bureau of Meteorology Atmospheric Regional high-resolution Reanalysis for Australia (BARRA) – completed in 2019. This will lead to a foundational dataset to provide a consistent, detailed characterisation of historical hazards and continuous intelligence. It is a part of a strategic initiative to establish a single authoritative source of information, analysis and expertise on climate and natural disaster risks that is focused on relief, recovery and resilience. The enhanced reanalysis is expected to span the era of modern meteorological satellites from 1979 and will be kept up to date as an operationally supported system. The reanalysis will use the same modelling components as those in other modelling systems in the Bureau including nowcasting, weather forecasting, seasonal forecasting and regional climate projections, reflecting the Bureau's strategy for a common modelling approach across all time scales from historical analysis to multi-decadal outlooks to support seamlessness in services. Here we report on the quality of BARRA and the development of the enhanced reanalysis, and benchmarking results against the Bureau's global numerical weather prediction system and the global reanalyses. We also describe how BARRA is disseminated to users and used to inform climate risk.

Keywords: Regional reanalysis, atmospheric modelling, BARRA

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