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The impact of climate change on the drought variability over Australia

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Drought has significant environmental and socio-economic impacts in Australia. Government assistance for drought events is guided by the current National Drought Policy (NDP). The Commonwealth Government provides support to farmers and rural communities under the Exceptional Circumstances (EC) arrangements and other drought programs, while state and territory governments also participate in the NDP and provide support measures of their own. To be classified as an EC event, the event must be rare, that is must not have occurred more than once on average in every 20-25 years. Given the likely increase in the area of the world affected by droughts in future due to climate change (IPCC, 2007), this paper presents assessments on how climate change may affect the concept of a one in 20-25 year event into the future for Australia.

As droughts can be experienced and defined in different ways, many drought indices are available to monitor and to assess drought conditions. Commonly, these indices are categorised into four types: meteorological, hydrological, agricultural, and socio-economic. The meteorological drought indices are more widely used because they require data that are readily available and that they are relatively easy to calculate. However, meteorological drought indices based on rainfall alone fail to include the important contribution of evaporation. Here, the assessment is made using outputs of 13 global climate models (GCMs) and a meteorological drought index called the Reconnaissance Drought Index (RDI). It incorporates the aggregated deficits between the rainfall and the evaporative demand of the atmosphere. If the RDI were the sole trigger for EC declarations, then the mean projections indicate that more declarations would be likely in the future. As a comparison, results from an assessment based on other measures (temperature, rainfall, and soil wetness) will also be presented.

IPCC, 2007: Climate Change 2007 - The physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (eds. Solomon, S. et al.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, www.ipcc.ch