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Title: BARPA-R Regional climate modelling with the ACCESS and the UM

Abstract:

The BARPA-R (Bureau of Meteorology Atmospheric Regional Projections for Australia) regional climate modelling system has been designed to downscale global climate projections (e.g., CMIP6) over the Australasian region. BARPA-R aims to provide reliable climate change information at the regional and local scales relevant for informing climate adaptation decisions in support of Australian Climate Service (ACS). However, regional climate models present a unique set of challenges. This talk will firstly explore subtleties, pitfalls and solutions encountered when using the regional Australian Community Climate and Earth-System Simulator (ACCESS) model and similar models in climate projection mode. Special focus is given to the role of lateral boundary conditions and to sea surface temperatures. Examples are drawn from BARPA and from the UK-based TerraMaris dynamical downscaling exercises. Secondly, the value of downscaling from global models will then be explored through a comparison of BARPA to the global models. We investigate the degree to which the BARPA-R setup is able to represent Australia's present-day climate when downscaling both ERA-5 and independent global climate models. These insights are important to inform uses of the new BARPA climate data sets as they become available for downstream climate applications.