



National climate projections for Australia: prospects and challenges

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Over the past twenty years, CSIRO has had the leading role in providing national climate change projections designed to serve the needs of adaptation planning in Australia. The previously issued projections dating from 2007 have been widely used and cited in Australian adaptation work. Currently, new national projections based on global simulations from the CMIP5 multi-model archive and downscaled data are being prepared by CSIRO in collaboration with the Bureau of Meteorology. Along with the key messages about projected climate change in Australia, we present the main improvements over the 2007 projections and we discuss some of the challenges.

We use a time series representation of climate change in sub-continental regions to illustrate the interplay of forced change and natural variability. Also, this representation allows us to put the projected change in context of the recent observed change. In addition, thanks to the increasing availability of daily and sub-daily simulation data, changes in climate and weather extremes can be more comprehensively addressed. We contrast changes in extremes with the respective changes in seasonal and annual averages to highlight differences in the response to anthropogenic forcing such as the projected increase in heavy precipitation events despite a general tendency for drying in some regions. The major challenge in the development of the current national projections, on the other hand, relates to the diversity of projections information available to users. As part of the currently developed projections, we compare and assess a wide range of regional projection methods including summaries of all available global climate model simulations, weighted summaries depending on an evaluation of various metrics of climate model skill, and projections based on more sophisticated statistical models. Furthermore, we present a framework to relate the current projections back to previous projection products and to compare projections based on different types of data such as downscaled data and output from global climate models.