

## REGIONAL CLIMATE CHANGE SCENARIOS FOR AUSTRALIA

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## 1. INTRODUCTION

Small perturbations to the mean climate may produce relatively large changes in the probabilities of extreme events [1,2,3,4,5]. To determine the sensitivity of extreme temperature probabilities to greenhouse warming, a warming scenario was developed, based on the results of General Circulation Model (GCM) simulations. Although the reliability of climate model information on regional scales remains poor, the best possible advice on regional greenhouse impacts is in demand and must be provided through scenario development and sensitivity studies.

A detailed intercomparison of the results produced by 4 different GCMs has been performed by Grotch [6], for both control simulations (atmospheric CO<sub>2</sub> concentration of around 300ppm) and perturbation simulations (equivalent to doubled CO<sub>2</sub>). The perturbation case represents the proposed situation expected by as early as the year 2030 due to the combined effect of increased levels of all greenhouse gases [7], though the thermal inertia of the oceans may delay the surface temperature response by a further 10-20 years. The models considered were developed by (i) the National Centre for Atmospheric Research (NCAR), (ii) the Geophysical Fluid Dynamics Laboratory (GFDL), (iii) the