

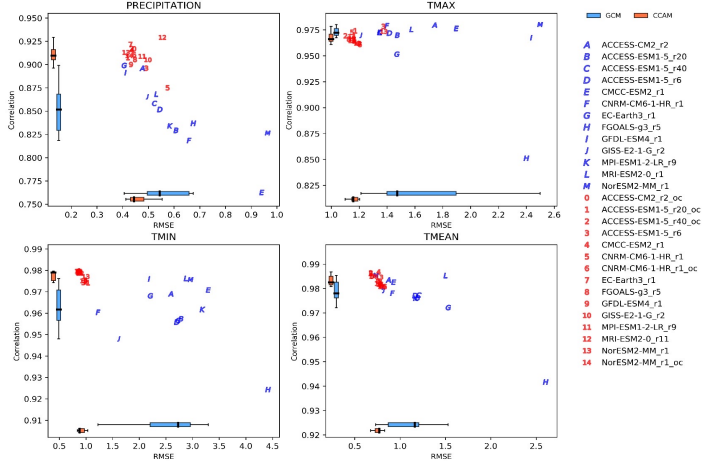
Dynamically downscaled CMIP6 climate projections for Australia

Jozef Syktus & Ralph Trancoso – School of the Environment, University of Queensland & Department of Environment and Science

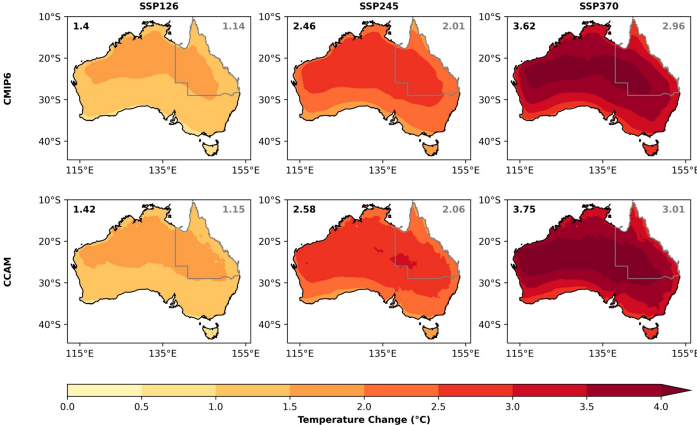
Variable resolution CCAM model was used dynamically downscaled 15 CMIP6 GCMs to a 10 km resolution over Australia using variable resolution global CCAM (Conformal Cubic Atmospheric model) for each SSP 126, 245 and 370. This ensemble includes 5 simulations with coupled atmosphere-ocean CCAM for each of SSP scenarios.

CMIP6 Model	Model full name/dynamically downscaled 15 CMIP6 GCMs to a 10 km resolution over Australia using variable resolution global CCAM (Conformal Cubic Atmospheric model) for each SSP 126, 245 and 370. This ensemble includes 5 simulations with coupled atmosphere-ocean CCAM for each of SSP scenarios.	Ensemble member	Resolution
ACCESS-ESM1-5	Australian Community Climate and Earth System Simulator, version 1.5, CCAM atmospheric model version	r6i1p1f1	1.875 x 1.25°
ACCESS-ESM1-5_oc	Australian Community Climate and Earth System Simulator, version 1.5, CCAM coupled ocean model version	r20i1p1f1 r40i1p1f1	1.875 x 1.25°
ACCESS_CM2_oc	Australian Community Climate and Earth System Simulator, version 2, CCAM coupled ocean version	r2i1p1f1	1.875 x 1.25°
CMCC-ESM2	Centro Euro-Mediterraneo sul Cambiamenti Climatici	r1i1p1f1	0.9 x 1.25°
CNRM-CM6-1-HR	Centre National de Recherches Météorologiques Coupled Global Climate Model, version 6.1, high-resolution	r1i1p1f2	0.5 x 0.5°
CNRM-CM6-1-HR_oc	Centre National de Recherches Météorologiques Coupled Global Climate Model, version 6.1, high-resolution, CCAM coupled ocean version	r1i1p1f2	0.5 x 0.5°
EC-Earth3	European Community Earth-System Model, version 3	r1i1p1f1	0.8 x 0.8°
FGOALS-g3	Flexible Global Ocean-Atmosphere-Land System Model, grid point version 3	r5i1p1f1	2.5 x 2.5°
GFDL-ESM4	Geophysical Fluid Dynamics Laboratory Earth System Model, version 4	r1i1p1f1	1 x 1°
GISS-E2-1-G	Goddard Institute for Space Studies Model E2.2G	r2i1p1f2	2. x 2.5°
MPI-ESM1-2-LR	Max Planck Institute Earth System Model, version 1.2, low resolution	r9i1p1f1	1.9 x 1.9°
MRI-ESM2-0	Metropolitan Research Institute Earth System Model, version 2.0	r1i1p1f1	1.125 x 1.125°
NorESM2-MM	Norwegian Earth System Model, version 2, 1 degree resolution	r1i1p1f1	1 x 1°
NorESM2-MM_oc	Norwegian Earth System Model, version 2, 1 degree resolution, CCAM coupled ocean version	r1i1p1f1	1 x 1°

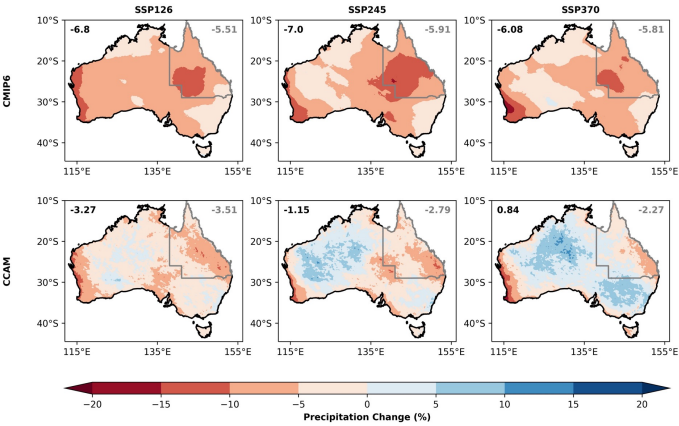
Annual RMSE and Correlation for 1981-2010 for CMIP6 and CCAM models - Australia



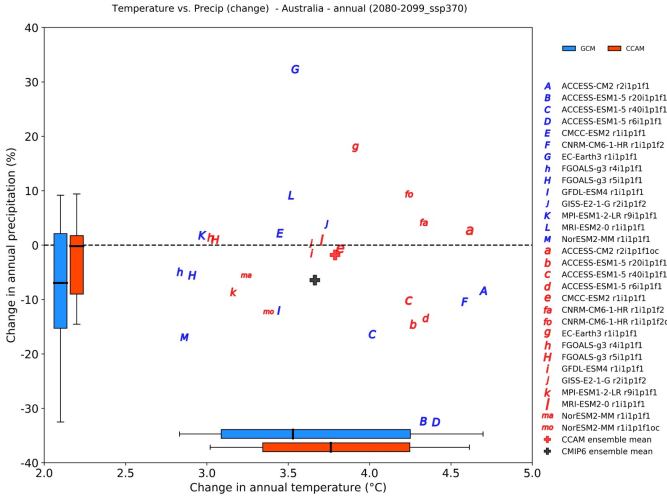
Results - Climate change Projections



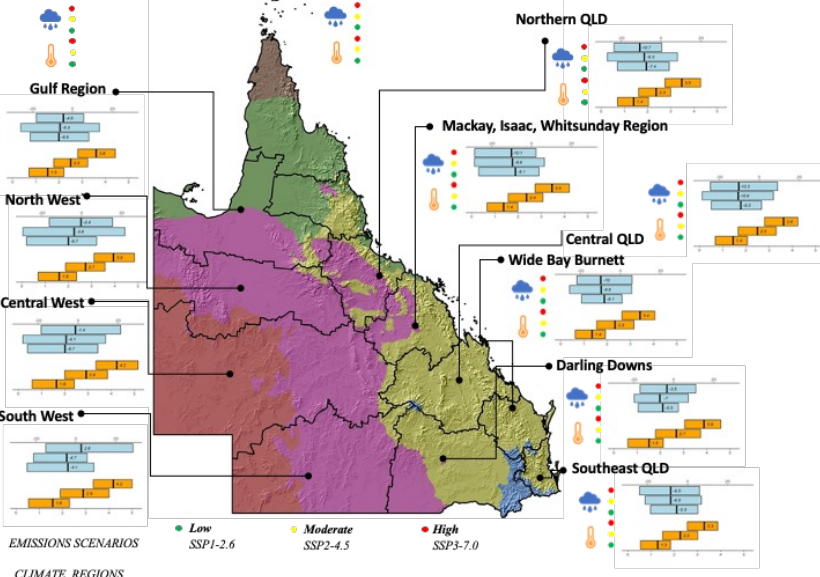
Annual temperature change for 2090 - Australia



Annual precipitation change for 2050 - Australia



Projected changes in annual temperature & precipitation SSP370 - 2090 Australia (upper) & Qld (lower)



Summary

Completed extensive set of projections at 10 km resolution for Australia.

Data processed for CORDEX Australasian domain archive at NCI

Data processing to derive climate hazard information and update Queensland Future Climates dashboard on longpaddock web site