# Climate Projections: Model Choices for this Portal

Climate change projections show how climate may change in the future. There are a range of things to consider when relying on climate change projections to help formulate your natural resource management decisions. For a full discussion of the CSIRO climate change projections, please see the [Climate Change in Australia](http://www.climatechangeinaustralia.gov.au/en/climate-projections/explore-data/threshold-calculator/) website.

When displaying climate projections, the timeframe, CO2 equivalent emission scenario (RCP), model applied and relevant climate variable need to be chosen. The information displayed in this web portal are based on 2030 and 2070 projections, using a high (RCP 8.5) and low (RCP 4.5) emission scenario. Models used were selected using the CSIRO [Projections Builder Tool](http://www.climatechangeinaustralia.gov.au/en/climate-projections/climate-futures-tool/projections-builder/) and six climate variable themes have been selected to be displayed.

The rationale for these selections is described below.

Timeframes

The timeframes of 2030 and 2070 were chosen for two main reasons:

1. To best coincide with data generated from the previous CMIP3 modelling, in particular the University of Western Australia’s native species modelling and the Department of Agriculture and Food WA agricultural production modelling also presented on this website. To see a discussion on how CMIP3 and CMIP5 models compare go [here](http://www.climatechange.environment.nsw.gov.au/Climate-projections-for-NSW/About-NARCliM/CMIP3-vs-CMIP5).
2. To be consistent with the timeframes over which planning for agriculture and natural resource management decisions will be made i.e. for the near-term (2030 - fifteen years from today) and medium-term (2070 – 65 years from today).

Representative Concentration Pathways

The latest climate projections are based on four different representative concentration pathways (RCP) which represent a broad range of potential climate futures from very low emissions scenarios (RCP 2.5) to high emissions scenarios (RCP 8.5). For this website, we chose the intermediate (RCP 4.5) and high emissions (RCP 8.5) scenarios. RCP 4.5 projects that temperatures will be 1.1-2.6 °C warmer; and the CO2 concentration will reach 540 ppm by 2100. RCP 8.5 projects that temperatures will be 4.8 °C warmer in a future with little curbing of emissions, with a CO2 concentration rapidly rising to 940 ppm by 2100.

Users of this website should keep in mind that there are a wider range of potential climate scenarios than presented here. These data are available from the CSIRO [Climate Change in Australia](http://www.climatechangeinaustralia.gov.au/en/climate-projections/climate-futures-tool/projections-builder/) website, however, they are not analysed at the regional and sub-regional scale as presented here.

Climate Themes for Sustainable Agriculture and Biodiversity

The data are presented here under six climate themes deemed relevant to sustainable agriculture activities and biodiversity impacts in the Wheatbelt region:

1. Average Annual Temperature;
2. Minimum temperature during frost risk times (Jun-Aug);
3. Maximum temperature during heat stress risk times (Sep-Dec);
4. Average annual rainfall;
5. Growing season rainfall and;
6. Summer rainfall.

*Model Choices*

For the purposes of this web portal, the CSIRO [Projections Builder Tool](http://www.climatechangeinaustralia.gov.au/en/climate-projections/climate-futures-tool/projections-builder/) has been used to guide the selection of the most relevant models to use for the Wheatbelt (Avon) NRM region. In all cases, the “maximum consensus” representative models were chosen for spatial data download. All had a moderate (33-66%) consensus. Data were accessed from the CSIRO [Map Explorer](http://www.climatechangeinaustralia.gov.au/en/climate-projections/explore-data/map-explorer/) 18/08/2015.

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| Table x. Models chosen for data download |
| RCP | Timeframe | Maximum Consensus Model | Consensus |
| 4.5 | 2030 | [CanESM2](http://www.climatechange.environment.nsw.gov.au/Climate-projections-for-NSW/About-NARCliM/CMIP3-vs-CMIP5) | Moderate |
| 4.5 | 2070 | [CESM1-CAM5](http://www.climatechangeinaustralia.gov.au/en/climate-projections/climate-futures-tool/model/51/) | Moderate |
| 8.5 | 2030 | [CESM1-CAM5](http://www.climatechangeinaustralia.gov.au/en/climate-projections/climate-futures-tool/model/51/) | Moderate |
| 8.5 | 2070 | [GFDL-ESM2M](http://www.climatechangeinaustralia.gov.au/en/climate-projections/climate-futures-tool/model/49/) | Moderate |