

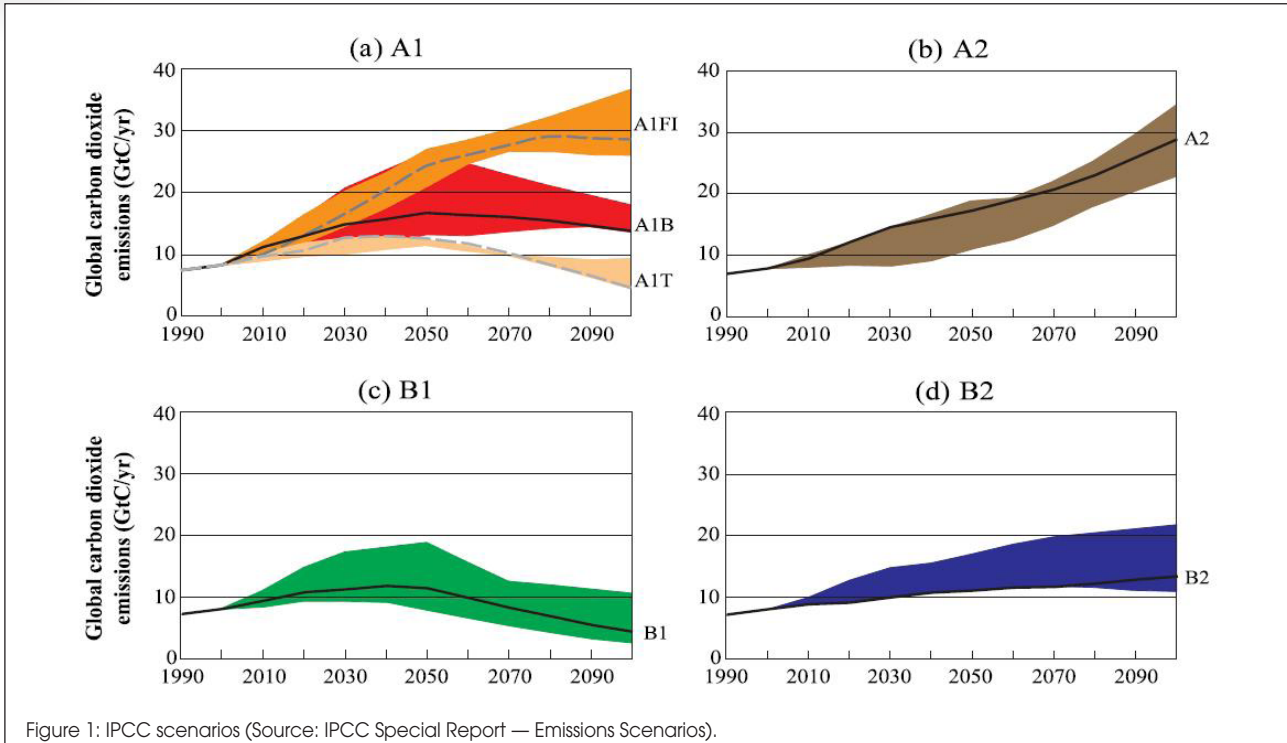
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# Climate change

## Climate change projections for Western Australia



The future of our climate is dependent on the concentrations of greenhouse gases in our atmosphere. As a basis to predict our climate in the future, the Intergovernmental Panel on Climate Change (IPCC) has developed a range of possible scenarios of greenhouse gas concentrations in our future atmosphere.

Climate projections use these scenarios as inputs into climate models that simulate our possible future climate. These scenarios include assumptions about future socioeconomic, political and technological developments. As human behaviour is difficult, if not impossible to predict, the scenarios are therefore subject to uncertainty.

Scientists try to capture the uncertainty in the future emission scenarios by analysing a range of possible future scenarios using different global models.

### WHAT ARE THE PROJECTED IMPACTS OF CLIMATE CHANGE ON WESTERN AUSTRALIA?

Impacts of global climate change are difficult to predict at a sub-continental or regional level or for particular time scales. However, international global climate models suggest that as atmospheric greenhouse gas concentrations continue to rise, Western Australia (WA) will become warmer and rainfall patterns will change.

Climate projections for WA were done under a range of IPCC emissions scenarios using nine international models to reproduce Australian climatology.

In the south-west of WA, rainfall has already decreased and the modelling projected that it will continue to decrease throughout this century. Future increases in temperature and potential evaporation are also anticipated.

To investigate the extended dry conditions experienced in the south-west of WA, the WA Government established the Indian Ocean Climate Initiative (IOCI) in 1998. The IOCI research program projected that for south-west WA:

- by 2030, rainfall will decrease by two to 20 per cent;
- by 2030, summer temperatures will increase by 0.5 to 2.1°C;
- by 2030, winter temperatures will increase by 0.5 to 2.0°C;
- by 2070, rainfall will decrease by five to 60 per cent;
- by 2070, summer temperatures will increase by 1.0 to 6.5°C; and
- by 2070, winter temperatures will increase by 1.0 to 5.5°C.



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## CLIMATE CHANGE RESEARCH IN WA

Changes in climate have implications for our lifestyles, agriculture and industry in WA. These changes to the State's climate could directly affect agriculture, forestry, health, biodiversity, water resources, energy demand, tourism, fisheries and industry. The stress on Perth's water resources will only continue to grow, with further projected rainfall decreases.

Stage 3 of the IOCI four-year work program began in March 2008. The Stage 3 work program has been extended to investigate the climate variability in our resource-rich north-west in addition to continuing work on further climate investigations in south-west WA.

Climate change is not only affecting our terrestrial climate but also our marine environment. Sea surface temperatures in the south east Indian Ocean, including the lower west coast of Western Australia, have increased by 0.6 to 1°C during the past 50 years, while the strength of regional ocean currents have reduced by 20 to 30 per cent. These trends will likely continue under different climate change scenarios, that is, sea surface temperatures will increase by 1 to 2°C by the 2030s and 2 to 3°C by the 2070s. Node 2 of the Western Australian Marine Science Institution (WAMSI) research program investigates the current and future trends of regional ocean currents, especially in the Leeuwin Current off the west coast of WA and the impacts of climate change on our marine environment. The research program aims to understand the causes and mechanisms of the change in the marine environment off WA due to climate change and to downscale these future changes in regional marine environment.

## MORE INFORMATION

[www.ioci.org.au](http://www.ioci.org.au)

[www.dar.csiro.au/impacts](http://www.dar.csiro.au/impacts)

[www.bom.gov.au/climate/enso](http://www.bom.gov.au/climate/enso)