



South Eastern Australian Climate initiative

CLIMATE VARIABILITY & CLIMATE CHANGE IN SOUTH EASTERN AUSTRALIA

The climate of south eastern Australia, including the Murray–Darling Basin, is highly variable. The region spans several different climate zones – cool, humid eastern uplands; the temperate southeast mallee; inland subtropical northern areas; and hot, dry arid and semi–arid country in the far west. As well as the differences in climate between zones, large differences in temperature, rainfall and evaporation also occur within any zone on a seasonal and annual basis, and over periods of several years.

This variability is reflected in streamflows across the region, which has, historically, been subject to both extreme floods and droughts. For example, the River Murray System, which provides water to irrigators, communities and the natural environment in the southern part of the Murray–Darling Basin, has highly variable inflows from just over 2 000 GL in the driest year to more than 30 000 GL in wet years.

While land and water managers and farmers have largely adapted to this variability, climate change is expected to result in changes to both average rainfalls and temperatures and in the frequency and severity of floods and droughts. These changes are likely to have significant social, economic and environmental consequences.

How is our climate changing?

South eastern Australia, over the past ten years, has experienced drier conditions, which have had major impacts on water resources and the availability of urban and rural water supplies. For example, 2006 had the lowest water allocations to irrigators ever recorded.

Inflows to the River Murray system over the past 10 years have been 42% below average, but roughly comparable to flows recorded in the drought periods around the turn of the century and in the 1940s. In Victoria, streamflows in the east of the State over the past ten years have typically been around 25–50% below average, but in the west of the State they have been more typically around 60–90% below the long term average, Figure 2

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shows streamflow series from sites in north-west, north-east, south-west and south-east Victoria.

These trends in rainfall and streamflow records appear to be unusual when compared to records over the past 100 years. They look similar to the changes observed in south-western Australia from the mid 1970s. While research to date shows that climate change is expected to result in hotter and drier conditions across much of southern Australia, the changes in the past ten years are earlier and larger than would have been expected.

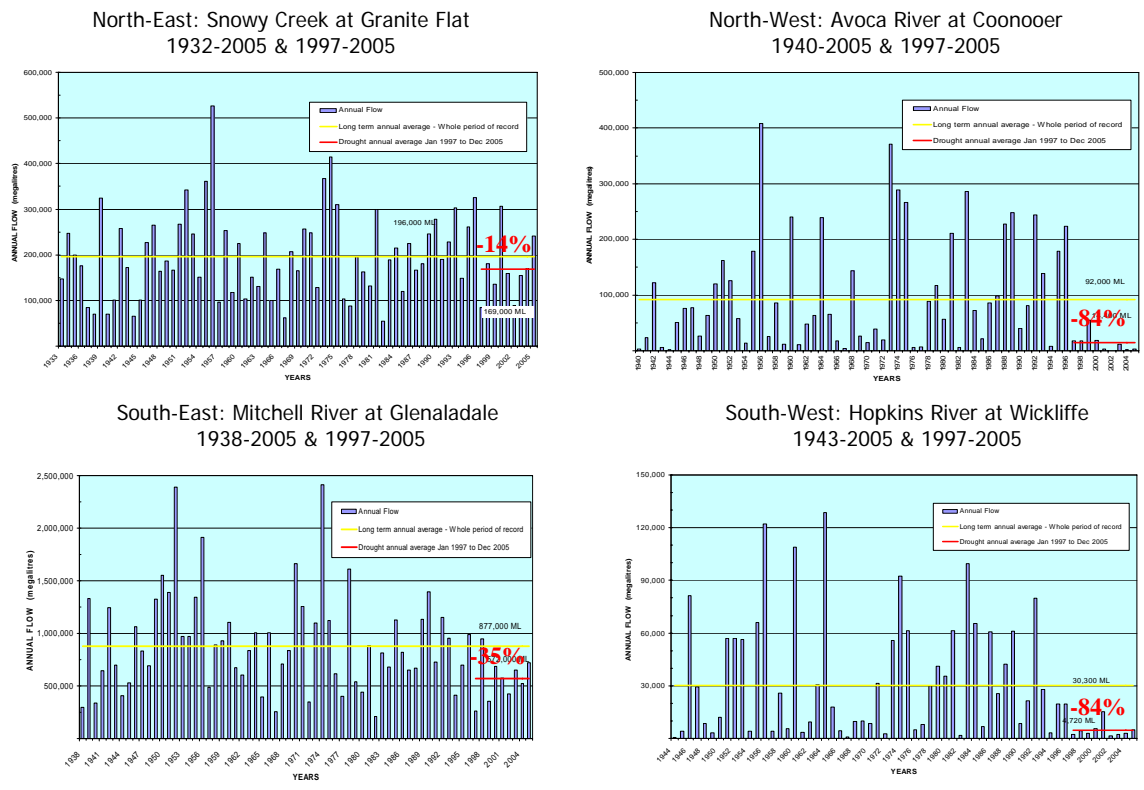


Figure 1: Average annual streamflows for four stations in Victoria

What is Causing the Changes?

In the case of south western Australia, research to date has indicated that both climate change and natural variability are likely to be contributing to the changes in climate, along with other key climate drivers such as the El Nino-Southern Oscillation. The likely causes of the current dry period in south eastern Australia will be investigated in detail as part of the South Eastern Australian Climate Initiative.

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Current research initiatives

Australian science institutions have active programmes of research that make important contributions to the understanding of the global climate system and the impacts of climate change and variability within Australia.

The Australian Climate Change Science Programme, jointly managed by AGO, CSIRO and BoM, is the chief driver of climate change research in Australia. The MDBC, the Victorian State Government and other organisations (including water authorities and Catchment Management Authorities) have also undertaken a range of relevant studies with a view to better understanding the impacts of climate change at a regional and local level.

Internationally, the science of climate change is assessed every few years by the Intergovernmental Panel on Climate Change, which issued its Third Assessment Report in 2001. The Fourth Assessment Report is scheduled for release in 2007.

Several programs have focused on Australian climate variability, for example the Managing Climate Variability program within the Land & Water Australia portfolio, which is of critical importance to grain producers and the agricultural sector more broadly.

SEACI will also build on the knowledge generated by the Indian Ocean Climate Initiative in Western Australia. This program of research has been running since 1998. Like SEACI, IOCI is aimed at better understanding both climate variability and climate change.

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