

# The Impacts of Climate Change

Escalating impacts of climate change are being experienced in south-eastern Australia with prolonged drought, record temperatures and devastating bushfires. Some areas have been in drought for more than a decade, while Melbourne, a city of 3.8 million inhabitants, has experienced 12 consecutive years with below-average rainfall, doubling the previous record from 1979 to 1984.

Australia's longest river, the Murray, has been severely depleted. It flows some 2,375km from the Australian Alps along the border between New South Wales and Victoria and through part of South Australia. Due to low rainfall, poorly managed and over-allocated irrigation quotas, the lower lakes of the Murray River estuary are rapidly drying up.

In January 2007, I competed against 450 yachts in a race that started in Milang, crossed Lake Alexandrina and headed down the lower Murray River to the river port at Goolwa. I recently revisited this area and observed the water level had dropped by 2 metres. I was able to walk where previously vessels anchored in Milang Bay, and the main wharf no longer reaches the water. This race, which had been run annually since 1966, was abandoned indefinitely in 2008; however, of more significance, the impact of low water levels on river communities has been devastating.

There are other impacts of climate change in south-eastern Australia. Heatwave conditions have been experienced in many communities this summer. On 7 February, a temperature of 48.8°C was recorded in Hopetoun in north-west Victoria, which is believed to be the highest temperature ever recorded in the southern hemisphere at that latitude. The temperature in Melbourne (154 years of records) that day was 46.4°C, which broke the previous record of 45.8°C, and was 3.2° hotter than the previous highest temperature for a February day. On the same day, the extreme temperatures, low humidity, strong winds and tinder-dry countryside precipitated the 2009 Victorian bushfires, which destroyed more than 2,000 homes and killed 173 people, making this Australia's greatest peacetime disaster.

Coastal communities are also threatened by the climate change impact of gradual rise in sea levels, resulting from thermal expansion of the oceans. This longer-term threat is being actively managed through a number of state-based programmes. In Victoria, for example, the Department of Sustainability and Environment Climate Change Adaptation Program was established to plan for the impacts of climate change. Under the Future Coasts Project, data have already been collected over the entire 1,000 kilometres of the Victorian coastline and extending offshore to the 20-metre isobath, using multiple topographic and bathymetric LiDAR sensors. A seamless digital elevation model is being produced to model the impact of sea level rise, storm surges, inundation and erosion to determine appropriate management and mitigation strategies.

Similar climate change projects in the coastal zone have been commenced by the Department of Planning and Infrastructure in Western Australia and the Department of Environment and Climate Change in New South Wales. This is testament to the growing concerns of the impacts of climate change currently being experienced in large parts of Australia.