

Reconstructing South-East Australian Climate History

An Australian Research Council Linkage Project

Determining whether the current 14-year drought is a natural climate event or part of human-caused climate change has become a critical issue for policy-makers. Researchers at the University of Melbourne are working with partners from around Australia and the world to better understand South-Eastern Australian climate history. It is the first study of its kind in Australia and the outcomes will be vital for planning for life in a hotter and drier future.

Australia's official weather records only extend back to the late 19th Century. This hinders our understanding of our natural climate patterns, and how they will be influenced by climate change. This lack of context also affects how we plan to manage our valuable natural resources into the future. Few people realise that an amazing amount of information about our climatic past is recorded in the logbooks of the first European explorers, governors' correspondence, early settlers' diaries, newly-founded newspapers and the works of 18th and 19th century scholars. Until now, these works have been unexplored for climate information.

This is currently the largest ARC Linkage project undertaken within the University's Faculty of Science. This landmark project, spanning the sciences and the humanities, draws together a team of Australia's leading climate scientists, water managers and historians to re-create SE Australia's climate record for the past 200-500 years. Our team is partnering with the following organisations:

- Australian Bureau of Meteorology
- The Met Office (UK)
- Melbourne Water
- The Murray-Darling Basin Authority
- The Victorian Department of Sustainability and Environment.
- The Powerhouse Museum
- The National Library Of Australia
- The State Library of New South Wales
- The State Library of Victoria
- The National Institute of Water and Atmospheric Research (NZ)
- Monash University
- The University of Exeter (UK)

The research team is assembling data from a variety of sources, including:

- **Palaeoclimate records**
 - Tree rings, coral, ice cores and speleothems in caves. Scientists use this information to reconstruct temperature and rainfall variations for hundreds of years.
- **Documentary records**
 - Historical records such as newspaper articles, correspondence, pastoral/farm records the diaries and accounts of early settlers.
- **Early Weather Data**
 - Weather journals, ship logbooks from Australia's earliest exploration and early weather station observations.

These diverse sources will allow our researchers to reconstruct past rainfall, temperature and atmospheric pressure conditions over South-Eastern Australia for the past 200–500 years.

The team has already developed a preliminary rainfall reconstruction for South-Eastern Australia since 1796. In comparison to a wetter 19th Century (containing two thirds of sustained wet periods), South-East Australia has experienced a drier 20th Century with a lack of prolonged rainfall since 1975. This result will be further explored as the study progresses.

Climate models predict that Australia's densely populated southeast will become warmer and drier under climate change. But in order to establish how the current changes can be viewed in a context of long-term natural variability, these reconstructions of past climate are crucial.

Further information:

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