South Eastern Australian Climate initiative

SEACI OVERVIEW

The South Eastern Australian Climate Initiative (SEACI) is a three-year, $7 million research program investigating the causes and impacts of climate change and climate variability across south eastern Australia, home of the Murray-Darling Basin.

SEACI is funded by the Murray-Darling Basin Commission (MDBC), the Victorian Department of Sustainability and Environment, the Australian Greenhouse Office within the Department of the Environment and Heritage and Australia's Managing Climate Variability program.

The research program, which commenced in 2006, will be carried out by initiative partners CSIRO and the Bureau of Meteorology. MDBC is the managing agency.

The initiative will address the increasing demand for improved climate risk management by furthering research on climate change and climate variability in south eastern Australia. SEACI will revolve around three research themes, focussing on current climate and its drivers, long-term projections of climate change and improved seasonal forecasting.

Theme 1: Characterisation and attribution of current climate will assess the current level of knowledge about climate variability and its drivers over south eastern Australia. This will involve the review of previous studies of climate variability in the region, analyses of site-specific meteorological records and the re-analysis data set[i], and experiments with global climate models to provide insight into the extent to which recent climatic trends and shifts can be attributed to various causal factors, including the enhanced Greenhouse effect.

Theme 2: High resolution climate projections and impacts will determine the extent to which climate in south eastern Australia is likely to change under enhanced greenhouse conditions. This will involve the use of a range of global climate models and downscaling techniques to improve estimates of likely future changes in average climate, inter-annual variability and extreme events, and the associated impacts on streamflows.

Theme 3: Seasonal forecasts will investigate whether reliable climate forecasts with a lead time of 3-12 months can be developed for south eastern Australia, and whether these can be applied to forecast streamflow and crop yields. This will involve evaluating the performance of existing climate forecasting systems for rainfall and temperature predictions, developing and evaluating new forecasting systems, and developing and testing alternative methods of translating the

improved climate forecasts into forecasts of streamflow and crop yield.

The SEACI geographical study area incorporates the Murray-Darling Basin, the State of Victoria and southern South Australia, including the agricultural areas of Eyre Peninsula.

SEACI is a major research program of around 40 research projects. Some projects cover the whole study area while others have a more specific geographic focus. In addition to the results generated by each project against its own milestones, the program itself aims to deliver a more holistic and better integrated understanding of climate change and climate variability across south eastern Australia, including what it will mean for water supply in Australia's major agricultural production region.

The knowledge to be gained through SEACI is vital for our land and water managers and farmers, and will help underpin the sustainability of the region and its industries. Recent trends in climate variability have had a noticeable affect on the inflows to the River Murray System (as shown in Figure 1). In the Macquarie Marshes in central western New South Wales, changes experienced have already led to a significant reduction in wetland extent and 35% reduction in frequency of breeding of colonially nesting waterbirds. Reflecting continued predicted reduction in flows into the Macquarie River, waterbird numbers are predicted to decline a further 11-34% by 2030.

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[i] The re-analysis data set is a data set that has been compiled to represent the most complete description of the physical state of the atmosphere from 1948. State-of-the-art models are used to reanalyse this historical data with a view to better understanding the key drivers and their interactions.