

INDIAN OCEAN CLIMATE INITIATIVE (IOCI)

STAGE 3 – REPORT 1

FOREWORD

The Indian Ocean Climate Initiative (IOCI) is a research partnership between the Government of Western Australia, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Bureau of Meteorology (BoM). The Initiative, formed in 1997, investigates the causes of the changing climate in Western Australia (WA) and develops projections of its future climate. IOCI formally began its Stage 1 program in January 1998 and Stage 2 started in July 2003. The research agreement for Stage 3 was signed by all parties in March 2008.

During the first two stages of the Indian Ocean Climate Initiative (IOCI), much was learnt about the multi-decadal rainfall decline in the first half of the winter half-year (May to July) over the South-West. Key scientific findings included:

1. Winter rainfall has decreased sharply and suddenly in the region since the mid 1970s.
2. The rainfall decline was accompanied by and apparently associated with changes in the large scale atmospheric circulation that are most likely due to a combination of natural variability and the enhanced greenhouse effect.
3. While the role of land cover change is unlikely to be a major factor, it should be recognised as a possible second-order effect.
4. There is increased confidence in a temperature rise and a decrease in winter rainfall (by as much as 20 percent relative to the 1960-1990 baseline) by 2030.
5. There are no current schemes utilising climate models that provide sufficient predictive skill for operationally-reliable seasonal forecasts for the South-West, and future work should focus on a rigorous theoretical assessment of predictive skill.

The IOCI Seminar and Workshop '*Living in our Changing Climate*', held in August 2005, laid the foundation for the proposed climate research programme of IOCI Stage 3 (IOCI 3). Priorities were further developed in a workshop held in April 2006 which identified the core focus and the outcomes that would be sought for decision support and capacity building in Western Australia.

Consequently, the economically important North-West region of the State is a major focus of the research program for IOCI 3. Work will continue on the South-West to infill outstanding knowledge and data gaps identified by the State. For example, the program will draw heavily on the extensive modelling studies carried out as a part of the Fourth Assessment Report of the IPCC (CMIP3, IPCC AR4), and will produce climate change scenarios for both the South-West and North-West at spatial and temporal resolutions that are much finer than those for the CSIRO Climate Change Scenarios released in October 2007.

IOCI Stage 3 is a four-year research programme consisting of four Themes:

1. Baselines, Predictability of WA Climate and Attribution of Climate Change.
2. Current and Future Climate of the North-West, including Extreme Events.
3. Very-High Resolution Climate Change Projections for the South-West.
4. Science Leadership and Support.

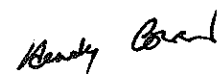
IOCI 3 is committed to establishing and maintaining state-of-the-art and regionally-specific knowledge of past and projected climate trends in the State of Western Australia, and making such knowledge available in a policy-ready form and for public information processes. The major objectives of the Initiative are:

1. To deliver climate research outcomes that will underpin sustainable development in the North-West and South-West regions of WA.
2. To enable the State to achieve economic, social and environmental benefits by drawing upon the strategic knowledge and technologies derived from the national climate science programs of BoM and CSIRO.

3. To enhance the State's accessibility to the current state of climate knowledge so that informed policy decisions can be reached.
4. To build a climate research capacity in WA that is focused on priority issues for the State.
5. To facilitate partnerships that will enable State agencies (and sectoral stakeholders) to integrate IOCI's climate research findings with their assessments of climate impacts, vulnerability and potential adaptation strategies.

The core research is conducted by Australia's Bureau of Meteorology; and CSIRO divisions of Marine and Atmospheric Research; Land and Water; and Mathematics, Informatics and Statistics under the auspices of CSIRO's Climate Adaptation Flagship. Collectively, these research institutions match the funding provided by the Government of Western Australia.

As yet is too early to expect specific applications to be available for this work, particularly for the North-West. Much of the work to date has focused on data collation and quality control, literature review and model building and refinement. However, the achievements of the first year of IOCI 3 will provide a strong platform for the research that lies ahead.



Hon Hendy Cowan

Chair Indian Ocean Climate Initiative Board

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