

Victorian Climate Initiative
PROJECT WORKPLAN
 21 May 2013 – 20 May 2014

1. Project Definition

| | |
|-----------------------|--|
| Project ID | VicCI - Project 5 |
| Project Title | Critical assessment of climate model projections from a rainfall perspective. |
| Project Leader | Name: Bertrand Timbal CAWCR/BoM Contact: 03 9669 4697 email: b.timbal@bom.gov.au |

| 2013 | Milestone | Achievement Criteria | Due date |
|------|---|--|-------------|
| 1 | Six-monthly progress report including (1) Progress against deliverables, (2) Research effort over the period, (3) Science achievements, (4) Publications/presentations, (5) Communications | Report accepted by Project Management Committee for incorporation into overall Progress Report to be submitted to the Steering Committee | 7 Sept 2013 |
| 2 | Twelve-monthly progress report with the same 5 sections | Report accepted by Project Management Committee for incorporation into overall Progress Report to be submitted to the Steering Committee | 21 Apr 2014 |
| 3 | Draft Annual Work plan for next year | Work plan accepted by Project Management Committee to be recommended to the SC | 21 Apr 2014 |
| 4 | Report on research undertaken for year (objectives, methods, results, discussion, conclusions, links to other projects, next steps) as contribution to the Program Annual Research Report | Project Annual Research Report accepted by Project Management Committee for incorporation into overall Program Annual Research Report to be submitted to the Steering Committee. | 1 May 2014 |
| 5 | A paper evaluating the uncertainties in CMIP5 model rainfall projections in term of key large-scale behaviour | Draft paper forwarded to the Project Management Committee. | 1 May 2014 |

2. Project Details

| | |
|---------------------------------|--|
| Introduction: | Climate projections from climate models are showing some consistent behaviour (e.g. dry to the south and wet to the north across SEA) and some inconsistent behaviour (the degree of future rainfall change). Some of this uncertainty is linked to the models' ability to represent important teleconnections (e.g. the impact of the SAM on the HC) and key modes of climate variability (e.g. the tropical influences of the Pacific vs. Indian oceans) identified through SEACI research as being important for SEA rainfall. In order to provide guidance as to which models to use for projecting future climate (with a particular focus on subsequent impacts on water availability), we need to assess individual models for the capability to simulate these key teleconnections and modes of climate variability. |
| Activity 1. Description | Compile CMIP5 model projections for key modes of variability relevant to Victoria climate [NB: while the work will be performed by CSIRO and BoM scientists involved in the NRM program, the purpose of this activity is to bring to the VicCI program a summary of the relevant findings relevant to Victoria] |
| Activity 1. Methodology | In connection with the on-going development of national climate change projections relevant to Australia's Natural Resource Management (NRM program), review all findings in relation to the ability of the latest state-of-the-art climate models (the CMIP5 database assembled as part of the preparation of the 5 th assessment report from the IPCC) to represent key teleconnections and modes of climate variability (tropical modes of variability in the Pacific and Indian oceans as well as high latitude annular modes of variability) relevant to Victorian climate. |
| Activity 1. Deliverables | A contribution to the Program Annual Research Report, relating the key findings from the analysis of CMIP5 as performed within the NRM program. |
| Activity 1. Outcomes | A better understanding of how the main modes of natural climate variability which are remotely connected with Victorian rainfall are projected to change into the future. |
| Activity 2. Description | Evaluate CMIP5 models projections of the changes in sub-tropical ridge (STR) and its relationship to the projected global warming. |
| Activity 2. Methodology | Compute the change in STR (intensity and position) from all the CMIP5 models which have provided the necessary data (monthly MSLP gridded fields) for the southern hemisphere and for the Australian region across several representative concentration pathways (RCPs) for the 21 st century and relate the changes to the intensity of global warming projected by the models. The ability of the model to reproduce the observed STR-rainfall relationship will also be investigated. |
| Activity 2. Deliverables | See activity 3. |
| Activity 2. Outcomes | See activity 3. |
| Activity 3. Description | Evaluate CMIP5 models projections of the changes in tropical Sea Surface Temperatures relevant to Victorian climate. |
| Activity 3. Methodology | Project future trends in tropical seas surface temperature warming onto the tri-pole index developed by Timbal and Hendon (2012) for as many CMIP5 models as possible |

| | |
|---------------------------------|--|
| | <p>(depending on data availability). For each model, compare the model behaviour regarding the pattern of tropical warming with model rainfall projections for south-eastern Australia.</p> <p>Doing this evaluation for as many CMIP5 models as possible will allow quantification of how much of the differences in rainfall projections from different climate models can be explained in terms of the pattern of tropical oceanic warming.</p> |
| Activity 3. Deliverables | <p>A paper evaluating the range of CMIP5 model rainfall projections for Victoria and quantifying their dependence to (1) the magnitude of projected global warming and its relation to STR changes and (2) the tropical warming across the Pacific and Indian basin.</p> |
| Activity 3. Outcomes | <p>An improved understanding of the source of the spread of rainfall projections amongst the latest state-of-the-art climate models which, in turn, will improve our understanding of how best to make use of model projections of future climate.</p> |