OzEWEX

The Australian Energy and Water Exchange Initiative

Jason Evans (presenting), Albert van Dijk & Seth Westra (co-Chairs)
GEWEX GHP meeting
3-5 October, Gif-sur-Yvette, France

What?

Overarching science question:
understand and predict Australia's fresh water resources and water security into the future *given Australia's many climate zones, relatively large climate variability and future climate change.*

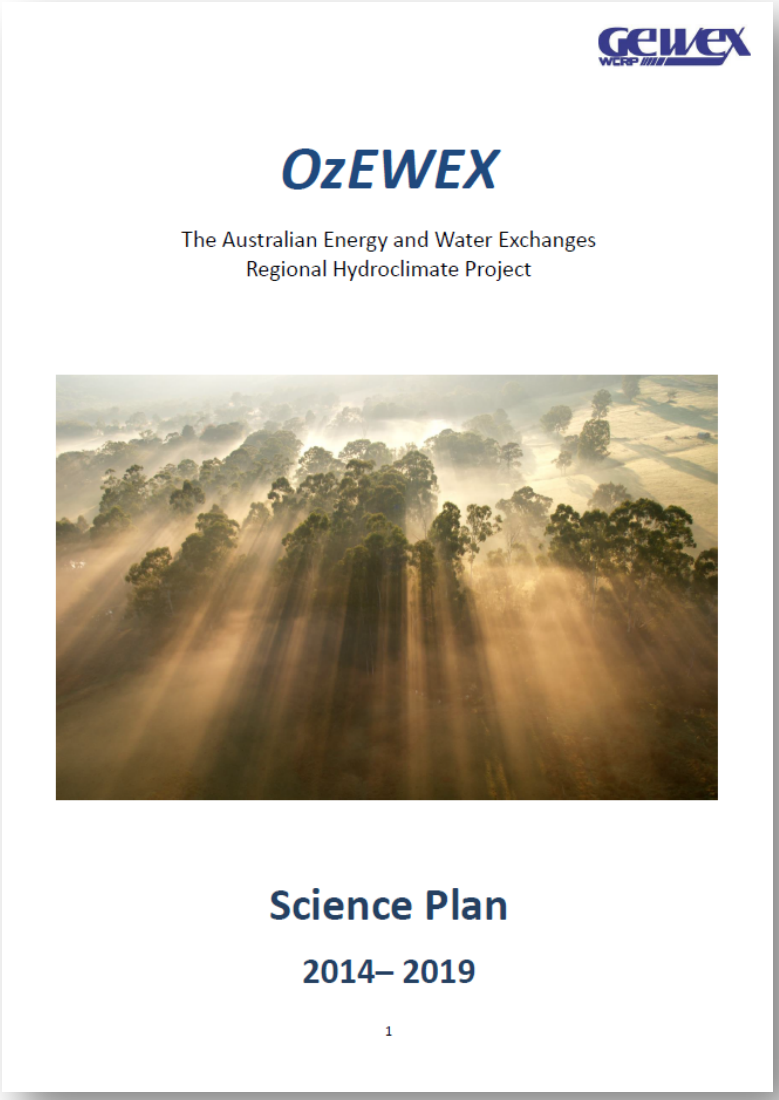
- promoting and facilitating data sharing
- collaboration and engagement between researchers, data providers, research users, resource managers and research managers.

Working groups around science priority areas:

1. Observational Data
2. Model Evaluation and Benchmarking
3. Data Assimilation
4. Trends and Extremes
5. Vegetation Processes
6. Hydrological Prediction

Working group activities:

- organising workshops
- data collection, collation and hosting
- collaborative experiments and development.

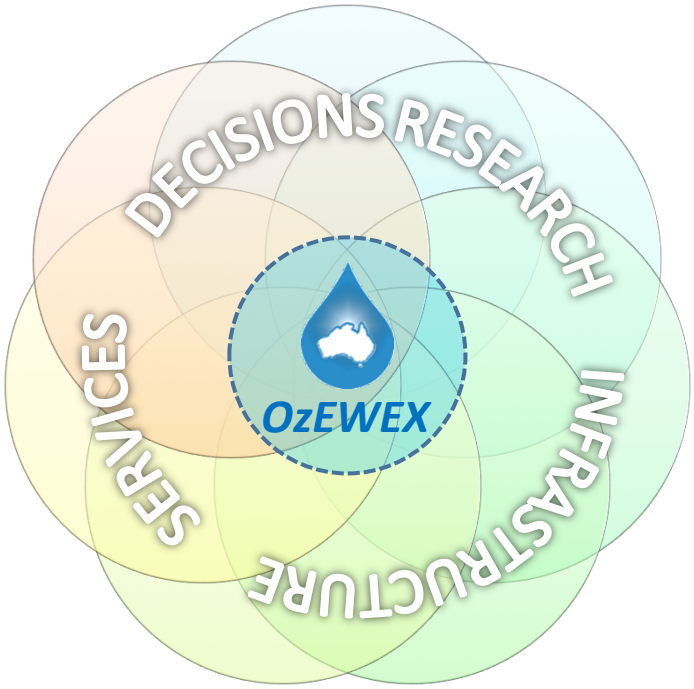


Who?

Universities

Governments and water managers

ARC Centre of Excellence for Climate System Science (ARCCSS)



Bureau of Meteorology

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

National Computational Infrastructure (NCI)

Terrestrial Ecosystem Research Network (TERN)

Activities over last year (highlights)

- National workshop in December 2015
- Special issue in Climatic Change on Australian Natural Hazards
- OzEWEX Soil Water Estimation and Evaluation Project (SWEEP)
- Protocol for the Analysis of Land Surface models (PALS) development continues
- OzEWEX newsletter publication frequency, original content and readership has increased

OzEWEX

THE AUSTRALIAN ENERGY AND WATER EXCHANGE RESEARCH INITIATIVE

2nd National Workshop | Broadbeach, QLD | 2nd December 2015

Spatial hydrology:
observation, modelling and forecasting

SUPPORTED BY

earthH2Observe

Australian National University

CSIRO

Australian Government
Bureau of Meteorology

ARC CENTRE OF EXCELLENCE FOR CLIMATE SYSTEM SCIENCE

GEWEX

Modelling & Simulation Society of Australia & New Zealand Inc.

HEPEX
Hydrologic Ensemble Prediction EXperiment

OzEWEX'15 Workshop

- Broadbeach, Queensland, 2 December 2015
- 113 participants
  - 55 from Australian universities
  - 25 from national agencies such as Bureau of Meteorology, CSIRO and Geoscience Australia
  - 8 from state agencies and private industry
  - 25 international
- Plenary session speakers
  - David Maidment (Utexas)
  - Jaap Schellekens (Deltares)
  - Howard Wheater (Usaskatchewan)
  - Eric Wood (Princeton)
- Three parallel sessions
- Report published in GEWEX News

Natural Hazards in Australia

- Special Issue of Climatic Change
- Articles explore our understanding of historical and projected changes to Australian Natural (climatic) Hazards
  - Floods - http://link.springer.com/article/10.1007/s10584-016-1689-y
  - Droughts - accepted (26 August 2016)
  - Coastal Extremes - http://link.springer.com/article/10.1007/s10584-016-1647-8
  - Heatwaves - http://link.springer.com/article/10.1007/s10584-016-1650-0
  - Extreme Bushfires - accepted (3 September 2016)
  - Storms, Wind and Hail - http://link.springer.com/article/10.1007/s10584-016-1737-7

Natural Hazards in Australia: Floods

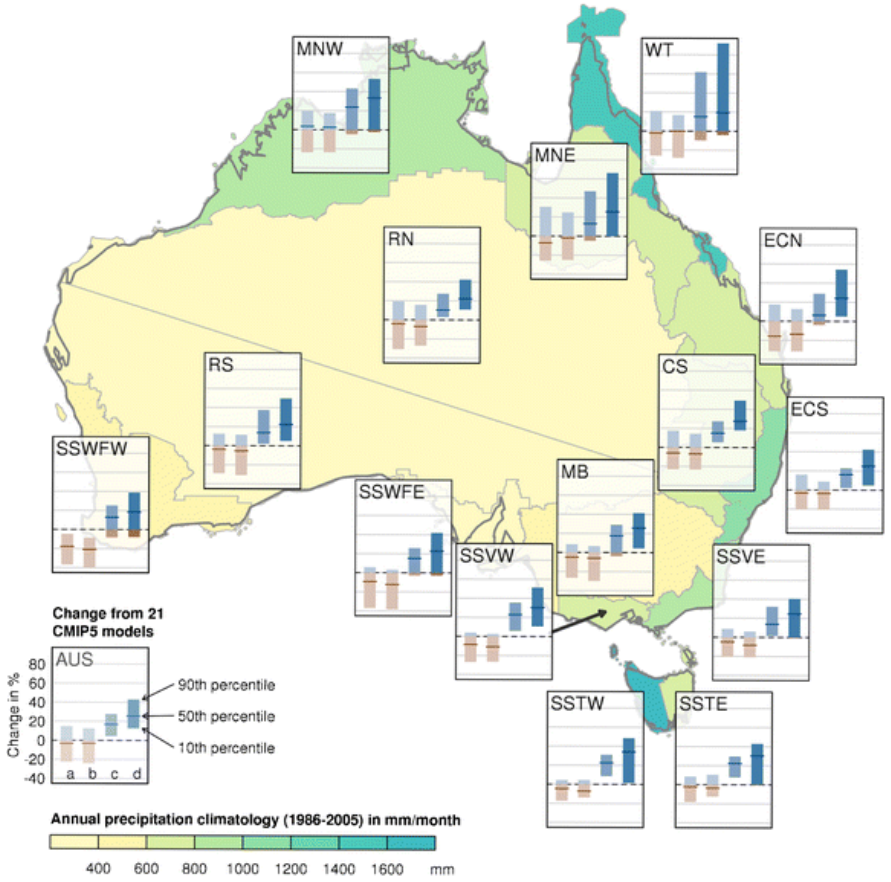


Fig. 3: Bars showing median and the 10th to 90th percentile range of projected change in daily rainfall for 2080–2099 relative to 1986–2005 for RCP8.5. Each box shows from left: (a) annual mean rainfall based on a set of 39 models and from a consistent subset of 21 CMIP5 models the (b) annual mean rainfall, (c) annual maximum daily rainfall, and (d) 20 year return level of the annual wettest day rainfall. Blue indicates increase and brown indicates decrease. The Australia average results are shown in the bottom left. Reprint from Figure 7.2.13 in CSIRO and Bureau of Meteorology (2015)

Natural Hazards in Australia: Storms, Wind and Hail

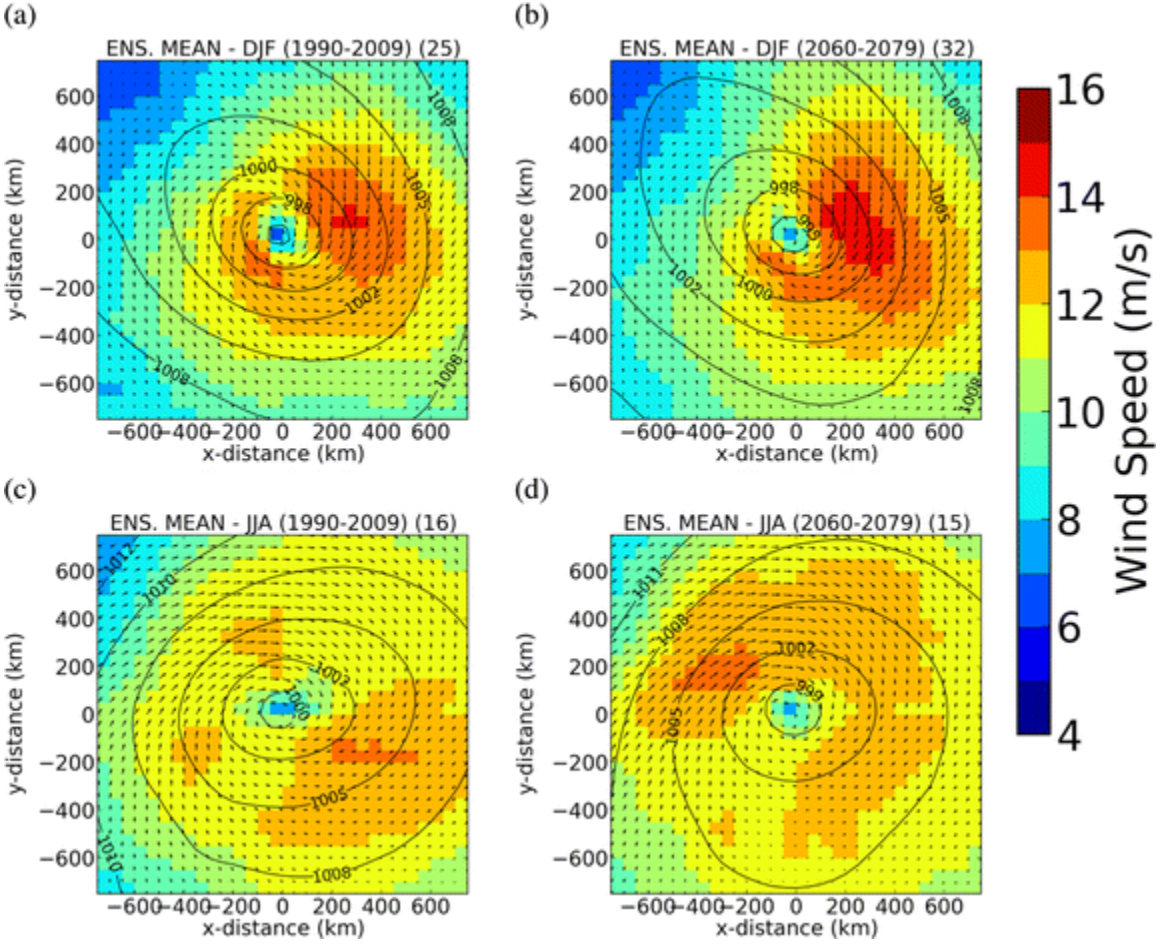


Fig. 1: Ensemble composites of summer (DJF: top row) and winter (JJA: bottom row) ECLs with a maximum wind speed greater than 20 ms−1 from the NARCliM ensemble for the recent past (1990–2010: left column) and the future (2060–2079: right column). Coloured contours and vectors indicate wind speed while solid line contours indicate the sea level pressure. The ensemble-mean number of events within the composite is indicated to the top-right of each panel

http://ozewex.org

Issues / Foreseen Risks

- Vegetation Processes WG disbanded

- Funding to sustain OzEWEX activities remains a challenge
  - Recently funded ARC Centre of Excellence for Climate Extremes ($30m) – focus includes droughts, heatwaves, extreme precipitation
- A number of participants recently lost employment at CSIRO

- Organisational structure currently being changed. To be finalised at next annual workshop.
  - Co-Chair has been introduced (Seth Westra)

New activities

Australian Climate and Water Summer Institute

- 15 students from Australia and New Zealand
- Will work in small teams for 6 weeks on projects developing an application or improvement to data services and analysis tools
- Partnership between universities and government agencies
- Summer Institute consortium partners: CSIRO, Bureau of Meteorology, Geoscience Australia, Murray-Darling Basin Authority, National Computational Infrastructure, Bushfire and Natural Hazards CRC, ARC Centre of Excellence for Climate System Science, several universities

GEWEX Science Questions

GSQ1: Observations and predictions of precipitation

- Collaborated with others from INTENSE on

Kendon EJ, Ban N, Roberts NM, Fowler HJ, Roberts MJ, Chan SC, Evans JP, Fosser G, Wilkinson JM. 2016. Do convection-permitting regional climate models improve projections of future precipitation change? Bulletin of the American Meteorological Society. DOI: 10.1175/BAMS-D-15-0004.1.

GSQ2: Global water resource systems

- Collaborated with Earth2Observe project by providing a model for the global water resource model ensemble and jointly examining data assimilation strategies

GSQ3: Changes in Extremes

- Natural Hazards in Australia special issue in Climatic Change

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Questions?