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Department of Biodiversity,
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Biodiversity and Climate Change Unit

For more information contact:

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Scope

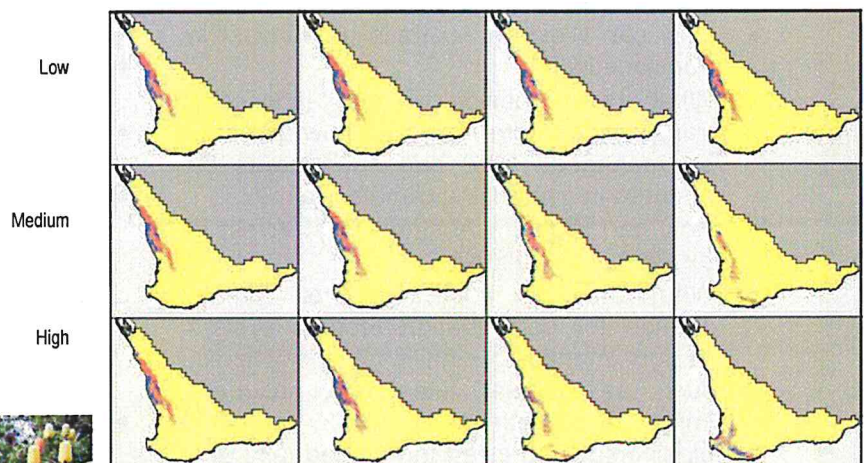
Climate is a fundamental influence on where plants and animals flourish, what communities and ecosystems develop in a location and what habitat is available there. Climate affects plants and animals directly by determining the temperature regimes and water availability in an area. Climate indirectly affects plants and animals by impacting on many of the most significant forces they experience, including fire, diseases, invasive species and salinity. Climate change has the potential to significantly impact on Western Australia's natural biological diversity.

Climate research through the Indian Ocean Climate Initiative program has demonstrated that climate conditions in south-west WA have change significantly during the past 40 years; in particular, the climate is becoming warmer and drier. Climate projections indicate that Western Australia faces ongoing climate changes. Managing the potential impacts of climate change on Western Australia's biodiversity requires sound knowledge of the vulnerability of species and communities to direct and indirect impacts.

The Biodiversity and Climate Change Unit (BCCU) focuses on research to develop an understanding of these impacts, especially the impacts on the potentially 'at risk' species, communities and ecosystems of Western Australia. This understanding provides the basis on which management responses to climate change are formulated and undertaken.

B. leptophylla

Historical 2030 2050 2070



The BCCU includes research scientists from all Science Division programs. It includes strengths in:

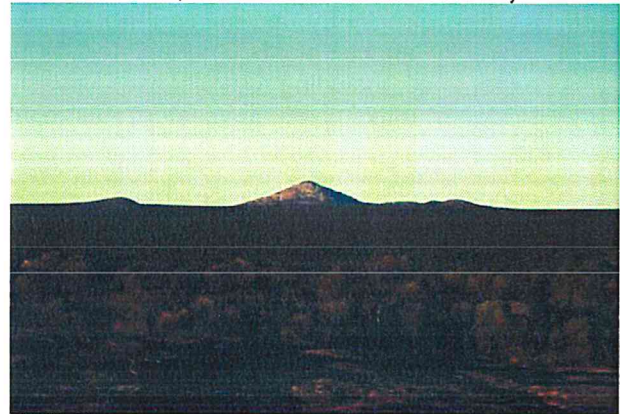
- Ecology.
- Modeling.
- Surveys.
- Phytogeography and genetics.
- Fire science.

Key research questions on climate change:

- What are the most appropriate species and ecosystem indicators for climate change, and how should these be best monitored?
- How will climate change directly affect biodiversity because of temperature and water availability thresholds and increasing atmospheric carbon dioxide concentrations?
- How will climate change affect existing pressures such as fire, hydrological regimes and introduced invasive species, and how will these changes affect biodiversity?
- Will climate change result in new pressures such as new invasive species or land clearing demands and how could these new pressures affect biodiversity?
- What role could contraction to refugia play in maintaining Western Australia's biodiversity? What are the important refugia to conserve biodiversity in a changing climate, and how should these be appropriately managed and complemented by other management strategies?
- What species will need to and be able to disperse to new locations?
- How can ecological connectivity best be improved and monitored?
- How can Western Australia best invest in translocation?
- What broad ecological and landscape transformation are likely and how can they be managed? How can such areas be restored in a changing climate regime?
- How can Western Australia best invest in *ex situ* conservation?
- What are the implications of climate change for conservation reserve system design, managing significant ecosystems, such as Ramsar sites and nationally important wetlands, and restoring biodiversity and listed threatened taxa and ecological communities?
- How can land and fire management affect the carbon cycle and greenhouse gas emissions more generally?
- How might climate change impacts on vegetation affect water quality and quantity?
- Disease science.
- Taxonomy.



Above: Climate Station; Below Granite – Photos by Colin Yates



How the Department of Environment and Conservation (DEC) is responding to climate change:

- Reducing departmental emissions through energy efficiency practices.
- Reviewing department practices to better understand further means of reducing emissions.
- Increasing understanding of the impacts of climate and climate change on Western Australian biodiversity.
- Assisting species to adapt to the impacts of climate change by:
 1. Protecting or establishing habitat corridors
 2. Protecting existing, and identifying new, refuges
 3. Building resilience to climate change by reducing existing threats to biodiversity
 4. Safeguarding the most vulnerable species.
- Establishing the BCCU.



Karlene Bain releasing a quokka