

RESEARCH DIRECTIONS

Saving Australia's drylands

Dr Uffe Nielsen from the Hawkesbury Institute for the Environment and a research team* has received a Discovery Project grant from the Australian Research Council to measure ecosystem responses to varying levels of rainfall in arid areas of Australia. The aim of the project is to determine how rainfall variability moderates dryland ecosystems. This will be achieved by investigating how historical rainfall regimes influence above and belowground ecosystems, and their resistance and resilience to imposed climate variability.

'Drylands make up over 40% of the world's land surface area, and are characterised by water scarcity and rapid moisture evaporation rates', Dr Nielsen explains. 'These areas are expanding due to unsustainable farming practices and climate change. Australia is home to many drylands, yet not much is known about how these unique landscapes respond to extreme climatic events, or how the above and belowground systems of microbes, invertebrates and plants adapt to changes in rainfall.' The investigation will use an experimental approach to measure potential dryland responses to extreme climatic events in an Australian context.

Six Australian dryland locations with climates of high or low rainfall variability will be tested. Their historical rainfall patterns will be examined, and the team will erect transparent rain shelters to simulate reduced and increased rainfall over some of them for approximately three years. During that time above and belowground community characteristics and ecosystem function will be measured. Samples will also be taken to a greenhouse and subjected to simulated climate events.

This research will help Australian policy makers improve strategies for identifying and protecting dryland areas vulnerable to changes in rainfall, forming a part of Australia's response to the predicted effects of global climate change.



Project Title: The legacy of rainfall patterns in dryland ecosystems

Funding has been set at: \$420,200

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