

Environment Institute Australian Centre for Evolutionary Biology and Biodiversity (ACEBB)

RESEARCH GROUPS



Evolution and Biodiversity of Australian Terrestrial Arthropods



Evolution and Diversity of Australasian Vertebrates



Ecology and Evolutionary Genetics of Plants



Evolution, Molecular Phylogeny and Palaeontology



Biology, Systematics and Evolution of Marine Parasites



Evolution of Mammalian Gametes, Gonads and Wildlife Conservation Genetics



Plant Systematics Herbarium



Biodiversity and Ecosystem Analysis and Modelling



Terrestrial Ecosystem Research Network and Transect for Environmental Decision Making

KEY STAFF



PROFESSOR ANDREW LOWE

Director of ACEBB



PROFESSOR ANDY AUSTIN

Deputy Director of ACEBB



PROFESSOR BARRY BROOK

Foundation Sir Hubert Wilkins Chair of Climate Change



PROFESSOR STEPHEN DONNELLAN

Head, Evolutionary Biology Unit



ACEBB is a nationally recognised centre of expertise in systematics, evolutionary biology and biodiversity science.



"We need an improved understanding of the world's biodiversity; we need to know how species will respond to environmental change, such as climate change, so that we can help manage ecosystems for our future."

PROFESSOR ANDREW LOWE Director

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OUR HISTORY IS WRITTEN IN DNA

The Australian Centre for Evolutionary Biology and Biodiversity (ACEBB) is the top research group of its type in Australia.

The research Centre takes a uniquely molecular approach to understanding our native flora and fauna, combining traditional expertise in systematics and evolutionary biology, with new developments in genomics, bioinformatics and statistical modelling. Through unlocking information stored in DNA ACEBB researchers are able to unlock the past distribution, responses to climate change and hence sensitivity to future environmental change of species and entire ecosystems.

A SUCCESSFUL COLLABORATIVE MODEL

The success of ACEBB has been underpinned by strong collaborative relationships between the SA Museum, State Herbarium and Bioknowledge, South Australian Department of Environment & Heritage and the University of Adelaide.

Through combining the strengths of these institutions, ACEBB has created facilities and expertise that are seen as the best practice model in Australia.

ACEBB is also a member of the Environment Institute, one of six research Institutes at the University of Adelaide which represent the best research capability in this highly research intensive University. The Environment Institute includes other research centres in environmental genetics, water, energy, marine biology and landscape management and is truly a trans-disciplinary research concentration.

Key statistics

Number of researchers: 48

Number of postgraduate students: 43

Journal papers published in 2008: 128



STRENGTHS



BIODIVERSITY DISCOVERY

ACEBB and its partners are actively searching to discover new species of plants and animals. Recently, ACEBB researchers were able to report the discovery of 850 new species of animals living in groundwater systems in remote areas of Australia. New molecular approaches have identified speciation not distinguished using traditional taxonomic techniques, which has led to the classification of a new species of Giant Cuttlefish in Spencers Gulf of South Australia, attracting visitors and scientists from around the world.



ADAPTATION TO CHANGE

Climate change is the great policy challenge of the 21st Century. ACEBB use their unique understanding of how Australian flora and fauna have responded to climate change in the past to inform how to help populations and ecosystems to adapt in the future. We use bio-climatic modelling, statistical modelling and genetic mapping to identify refugia that populations would contract to under conditions of climate change to inform conservation plans. These potent techniques can also be used to assess the risks posed to native populations and ecosystems in the face of climate change and other environmental threats such as habitat fragmentation.



BIODIVERSITY AND ECOSYSTEM MONITORING AND PLANNING

ACEBB have leading statistically modelling capabilities that can be used to improve our understanding of species dynamics, ecosystems and change over time in response to shifting environmental parameters. This is an important tool for planning at this challenging time in the Earth's history. ACEBB are also leading partners in the establishment of large scale monitoring programs to track the trajectory of biodiversity and ecosystems over time and space and in response to system stressors.



DNA BAR-CODING

DNA barcoding has opened up the possibility of environmental genomics allowing for an unprecedented resolution of ecosystem composition. Environmental genomics allow for monitoring at the landscape scale that can directly provide information for adaptive management cycles. ACEBB and its partners in the Australian Centre for Ancient DNA, also a member of the Environment Institute, are international leaders in the development of these new tools. The applications are diverse, ranging from faster, cheaper environmental impact assessment, tracking of timber origins, pest management, tracking animal products and forensics. Prof Andrew Lowe, Director of ACEBB is a member of the Science Consultative Group of the International Barcode of Life initiative that aims to provide a system to rapidly and inexpensively identify all life on Earth.



WORLD CLASS RESEARCH INFRASTRUCTURE

ACEBB have access to some of the best biological collections in the world from the SA Museum (animal collections), South Australian Herbarium (plant collections) and University of Adelaide (insect collection). The Environmental Biology Unit (EBU) at the University of Adelaide has outstanding genetics-based systematics infrastructure which is enhanced through collaboration with one of the few specialist ancient DNA laboratories in the world (the Australian Centre for Ancient DNA). Coupled with these key genetic laboratories is access to the Australian Genomics Research Facility (AGRF) that provides sequencing services to ACEBB members.