

Earth, Environment & Sustainability

Understanding our place within the environment and our impact upon it is vital for the creation and maintenance of sustainable communities. The need to further invest in research in this area has been brought into stark reality by the effect of water shortages and climate change.

The University has world recognised strengths in these areas of research, strengths that are also recognised by our local partners who include Department for Environment and Heritage, Department of Water, Land and Biodiversity Conservation, SARDI, CSIRO and the SA Museum.

Key areas of focus include: climate change and sustainability, natural resource management (including water resource management, environmental engineering and resource economics), sustainable agriculture, biodiversity, evolutionary biology and ecology.

University researchers work on marine and coastal systems, natural and constructed wetlands, estuaries, woodlands and the arid zone as well as agro-ecosystems. They also undertake research on the biology of plants and animals from the individual organism level to communities and ecosystems.

Water is a major priority area for our State and as a consequence, the University is heavily engaged with a range of research alliances and centres of excellence both across the state and nation. These investigate many critical issues around proper water management,

including: health implications; integrated regional management; preservation of ecosystems; optimised efficiency of water delivery, use, treatment and re-use; groundwater processes, hydrology, and fluid dynamics; wastewater management; water sensitive urban design, landscape architecture; and artificial wetland design.

In spite of current efforts to reduce CO₂ emissions, temperatures are still expected to increase and drier conditions will generate pressures on both biodiversity and agricultural systems across Australia. Therefore it is important to build knowledge

about the climate dependency of native and introduced species and how they are likely to respond to variations in climate, thereby identifying the most vulnerable systems and regions. Researchers also contribute to the increased sustainability of farming systems and engage in initiatives to improve and restore natural terrestrial and marine habitats.

One example of a successful engagement with direct and practical impact in environmental restoration is the Arid Recovery Project. The program was established in 1997 under a memorandum of understanding between WMC Resources (now BHP Billiton), the Department of Environment and Heritage, the University of Adelaide and Friends of Arid Recovery. The majority of the recovery work has been carried out on parts of the Olympic Dam Mine Lease and surrounding pastoral

properties. Work has included the creation of a reserve fenced to keep out rabbits, foxes and cats, allowing successful reintroduction of numbats, bilbies and the woma python, amongst other species. The Arid Recovery program has received numerous community and environmental awards and is a leading example of a partnership between industry, research organisations and the community.

Areas of Expertise

- Biodiversity
- Climate change
- Evolutionary biology
- Water management
- Water and environment engineering
- Waste water
- Resource economics
- Ecology
- Natural resource management
- Built environment
- Environmental restoration and recovery
- Environmental monitoring
- Marine ecology
- Coastal management

‘strengthen linkages between the users and providers of natural resource management science’

New Strategic Focus

Environment Institute

The newly established Environment Institute, directed by Professor Mike Young, undertakes multidisciplinary research to mitigate carbon emissions and develop adaptive strategies to respond to the anticipated impacts of climate change and water shortages. The Institute focuses on the following areas: energy, emissions and offsets, adaptive responses for sustainable environments, marine impacts, productive agriculture under global change, population health and social impacts, water use under increased climate variability and strategic climate policy. The Environment Institute also incorporates research expertise in climate change and sustainability, evolutionary biology and biodiversity, ancient DNA and landscape science and monitoring.

Equinox Group

The Equinox Group, headed by Professor Andy Lowe, is a new partnership between universities, government and industry which will work together on a range of flagship programs to retain South Australian biodiversity. The group will pool together to improve the use of available resources and expertise to shape sustainable landscapes. It aims to attract the large amounts of investment needed to enable restoration on a meaningful scale, enhance coordination of stakeholders in business, government and research and promote greater awareness and broader community participation

Natural Resource Management Research Alliance

The Natural Resource Management Research Alliance (the NRM Alliance) was established in September 2007 and includes science practitioners, research providers, State Government agencies, the NRM Council and regional NRM Boards. The main aim of the Alliance is to foster and strengthen linkages between the users and providers of NRM science, by working to align research needs with capabilities in South Australia, and by strengthening collaboration to increase capacity and capability. The Alliance also provides strategic advice on the adoption of NRM science, technology and innovation, and works to attract and direct investment that will support improved policy and outcomes on the ground

Services & Facilities

Water Quality Research Australia

The University of Adelaide is a research member of the recently established Water Quality Research Australia. This company has been set up to undertake collaborative research with a focus on drinking water quality, recycled water and relevant areas of wastewater management.

Water Environment Biotechnology Laboratory

The Water Environment Biotechnology Laboratory (WEBL), led by Associate Professor Bo Jin, is combined with the Wastewater Research Unit of SA Water. It is carrying out ground-breaking research in water reuse and recycling, particularly in finding potentially valuable products in wastewater resources.

Water & Environmental Engineering Research Group

The research carried out by this group covers the areas of sustainable water resources and infrastructure modelling and management. This ranges from hydrology to hydraulics, open channels to pipelines, hidden Markov models to Artificial Neural Networks.

EngTest

EngTest was established by the School of Civil, Environmental & Mining Engineering to conduct commercial testing, consulting and contract research. Clients are able to access skilled researchers and a great bank of technical equipment and facilities to address needs in the following areas, amongst others: environmental assessment (including of environmental impact on water resources, computer modelling of wetlands, wastewater treatment and re-use management), forensic analysis, hydraulics, geotechnical instrumentation and data acquisition, structure, vibration and fatigue.

Australian Centre for Ancient DNA (ACAD)

The focus of the Ancient DNA Laboratory is the study of evolution and environmental change through time using preserved genetic records in human, animal, plant and sedimentary material. Key interests include molecular studies of evolutionary processes in population genetics, phylogenetics and phylogeography, molecular clocks, and a variety of uses of temporally distributed DNA sequences. This is the sole research centre for ancient DNA research in the ‘Genographic Project’ funded by the National Geographic Society and Waitt Family Foundation, which aims to characterise large numbers of mitochondrial and nuclear markers in a broad survey of human populations around the world.