



ANNUAL REPORT
Environment Institute

VISION

The Environment Institute exists to deliver outstanding research across environmental sciences.

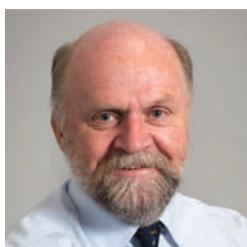
By understanding patterns and processes to derive solutions, we help enable decision-making that can meet today's and future needs.

OVERVIEW

The Environment Institute inspires a culture of innovation and collaboration. This is advancing the University's status as a centre for research excellence as well as addressing today's big challenges.



Dr Steve Morton
Chair, Environment Institute Board



Professor Bob Hill
Director, Environment Institute

The Institute brings together some of the world's leading researchers and outstanding scientific leaders. They add substantive depth to the University through their considerable academic standing and research achievements.

This expertise is applied to some of the greatest issues we face today.

Solving complex environmental issues calls for a collective approach, building on individual attributes, to enhance our external research impact. Our work is helping to develop the evidence to support government, industry and the community to make informed decisions and positively shape Australia's future.

The Institute is also central to fostering broad collaboration across the community and business sector. Examples include some of Australia's leading mining companies, industry and infrastructure businesses, working alongside many engaged regional partners, to address future environmental pressures that may be associated with development across the Spencer Gulf region.

Importantly, the Institute's research is reaching into complex adaptive – 'wicked' – problems. These issues typify environmental policy and its application. For example, our biodiversity groups are looking at more than just empirical climate change and biodiversity relationships. For effective change, we must understand and engage in the interface between this, policy and economics. Recent research across the Institute is addressing how climate change affects ecological systems and decision making. Similarly, our research into productive landscapes focuses on social uptake and implementation.

Achieving the next stage of the Environment Institute's aspirations will see the University shine even more brightly in environmental research for years to come.

INTRODUCTION

This short annual report is a condensed version of the Institute's full overview of 2012's achievements. For the detailed report please visit bit.ly/EI2012

BIODIVERSITY IN A CHANGING WORLD



 Watch Professor Andy Lowe on biodiversity
bit.ly/lowe2012

The Environment Institute conducts world-leading research on critical questions into consequences of human activity on living systems. The research helps to deliver practical ways to better monitor, manage and protect the health and biodiversity of ecosystems.

For example, our researchers are international leaders in developing next generation DNA sequencing techniques. This allows analysis of both living and dead material, including plants and animals at any life stage.

Whole systems are another focus - how species interact within the environment and what changes may mean for ecosystem resilience. This can be applied to understand the most cost effective mechanisms to achieve positive outcomes for living systems.

TOWARDS CLIMATE CHANGE SOLUTIONS



 Watch Professor Alan Cooper link
ancient and current climates
bit.ly/alan2012

We research the impacts of greenhouse gas emissions and the best mechanisms to address climate change. This year our work ranged widely from reducing carbon emissions to impacts on ecology, food productivity and adapting to future climates.

For example, we are looking at whole ecosystems and the ways that multiple factors might interact with climate change. Using such models we can predict extinction risk and the effectiveness of management interventions. This delivers both cutting edge science and practical management tools. Our modelling underpins analysis that is also applied to energy systems and whole human population questions.

MANAGING WATER FOR LIFE



 Watch Professor Justin Brookes
on the Coorong
bit.ly/brookes2012

In 2012 our water research delivered substantial insights into water management including for the Murray River. We work with government, industry and the community to balance human and environmental needs.

The Institute's ecologists, biochemists, hydrologists, engineers, mathematical modellers and social scientists are developing solutions to key water management issues such as:

- Efficient water allocation
- Processes influencing water quality
- Interactions between climate variability, landscape characteristics and stream flow
- Efficient planning and maintenance of water distribution for consumption

UNDERSTANDING THE ECOLOGY OF OUR OCEANS



 Watch Professor Bronwyn Gillanders
on the unique Spencer Gulf
bit.ly/gillanders2012

Australia has some relatively pristine marine resources. In 2012 we took major steps, across business and community stakeholders, to understand how to maintain environments in the face of development and climate pressures.

Our focus is on understanding the relationships between marine species, their reliance within ecosystems, and the connectivity of oceans with land-based habitats. This work includes investigating the ecology of rivers, estuaries, reef systems, gulfs, and open coasts using a whole-of-system approach to inform marine habitat management.

The Institute's seagrass, nutrient and climate change research are some of this year's highlights.

SUSTAINING VIABLE LANDSCAPES



Watch Professor Wayne Meyer on transformational land use
bit.ly/wayne2012

The Institute investigates future options for land use by considering environmental, economic and social implications. This research looks at how to protect agricultural profitability while repairing biodiversity and answering climate change adaptation imperatives.

In 2012 we worked extensively on the application of such Landscape Futures work. Our research responds to the realisation that natural resource management actions must answer simultaneous social and ecological pressures. These include farm profitability and biodiversity, alongside heat and likely climate induced water availability losses.

STRENGTHENING OUR RESPONSE



Watch Professors Corey Bradshaw and Barry Brook on engaging with science
bit.ly/bbcb2012

Our way of life, society and economy, both in Australia and globally, are increasingly threatened by the impact of human activity on our environment.

While many in our society recognise the importance of our environment, and the services it provides, this does not necessarily mean we act in our individual or collective self interest. To help address this, evidence and knowledge from the Institute underpin applying research to the 'wicked' problems we face today.

Our engagement with these complex issues - characterised by problems, within which there are unasked questions - in turn shapes our enquiries and empirical scientific research.

CONNECTING RESEARCH AND THE COMMUNITY



Watch Professor Martin Kennedy on the launch of our newest centre
bit.ly/sprigg2012

We connect our research to society through numerous channels and events, using a mix of traditional and digital media.

To our established blog, Twitter, Facebook, YouTube and LinkedIn networks, we have added Google+, one of the world's fastest growing social media platforms in 2012. One blog, BraveNewClimate, topped 3 million hits during the year.

The impact of our research resonates around the world. One piece of research, about an Australian wasp that eats Red backed spiders, featured in the New York Times and The Huffington Post and on the Discovery Channel.

Environment Institute

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