



MESSAGE FROM THE DIRECTOR

Welcome to our spring edition of the CEBRA newsletter, edition number eight. CEBRA's work is characterised by an environment in which research is focussed and sharpened by the needs of policy makers.

Our close relationship with government provides an opportunity to work on topics that are both scientifically challenging and important to the health of Australians and New Zealanders, their way of life and their environment. In this edition we learn how three of our people have been offered positions internationally and a fourth has won five international awards. Congratulations to Bonnie Wintle, Prue Addison, Marissa McBride and Jane Elith.

Further congratulations go to Tom Kompas who last month was elected to the Academy of Social Sciences in Australia. The Academy promotes excellence in the social sciences in Australia and in their contribution to public policy. As well as being a member of the CEBRA team, Tom is the Director of the Australian Centre for Biosecurity and Environmental Economics and Editor-in-Chief of Asia and the Pacific Policy studies at the Australian National University and CEBRA's Chief Investigator. Tom has dedicated much of his time to public policy in Australia and I'm proud to see this formally recognised.

Seminars and workshops involving visiting academics are an important part of our professional development and research activities. Last month, we were visited for two days by Prof. Kaori Karawasa, Prof. Hiroyuki Yamaguchi, Prof. Mizuka Ohtaka, Mr. Takeru Miyajima and Mr. Fumitada Noshita, all social psychologists from Japan, and by Prof. Leslie New and Dr Elizabeth Parlato, ecologists and statisticians from the United States and New Zealand respectively. Our joint interest was in further developing robust and operationally effective methods to acquire and collate expert judgements. The workshop was led by CEBRA's Victoria Hemming and it designed a set of studies that we will conduct over the next 18 months, to further test and improve our approaches to this very general and important topic.

The breadth of the work we do at CEBRA always inspires me and most recently I had the opportunity to participate in a workshop on "the Fanjing Mountain nomination for the World Natural Heritage" at the reserve in the northeast of Guizhou province, China in June. What an exhilarating place to hold a workshop! While the workshop was focussed on preliminary evaluation on the possibility of a nature reserve being nominated as a World Heritage site and study its Outstanding Universal Values I also got to visit the old growth beech forest and the

...three of our people have been offered positions internationally and a fourth has won five international awards. Congratulations to Bonnie Wintle, Prue Addison, Marissa McBride and Jane Elith

vertical distribution of the vegetation.

In CEBRA's last newsletter I talked about a number of new external contracts. I hope you enjoy the update on our exciting work with Chevron and the Queensland Institute of Technology at Chevron's Barrow Island.

Mark Burgman
Managing Director,
Centre of Excellence for Biosecurity
Risk Analysis

IN THIS EDITION

Message from the Director	P1
CEBRA Stars Shine	P2
CEBRA presents at NAPPO's Annual Meeting	P3
Project Update	P3
Optimising Surveillance Systems on Barrow Island	P4

CEBRA STARS SHINE

The Centre of Excellence for Biosecurity Risk Analysis (CEBRA) shines internationally. Three CEBRA research fellows, Prue Addison, Bonnie Wintle and Marissa McBride have been offered positions in the world's three best universities while a fourth, Jane Elith, has won five international awards for her work.

Their experience with CEBRA conducting robust scientific research, analysis, and expert advice on national Biosecurity issues, including importantly their focus on practical, policy-relevant research outcomes, has provided these four outstanding people with enviable experience, making them highly attractive researchers internationally.

Prue Addison has been offered a Senior Postdoctoral Knowledge Exchange Fellowship in Conservation Science at the University of Oxford under the supervision of Professor E.J. Milner-Gulland. The position will support work providing scientific advice to governments and businesses to improve their corporate biodiversity strategies. 'This is a great opportunity to assist multinational corporations operationalise the 'no net loss of biodiversity' principle: where biodiversity losses should be mitigated, and residual losses balanced with a biodiversity gain to ensure overall no net loss' said Dr Addison.

The Centre for the Study of Existential Risk (CSER) at the University of Cambridge has offered Dr Bonnie Wintle a research fellowship working on the *science of evaluating extreme risks associated with new technologies*. Dr Wintle will work with Professor William Sutherland to use Horizon-scanning and foresight for the early detection of extreme technological risk. 'Decision and policy makers today face a deluge of complex information and data. Horizon



Prue Addison



Bonnie Wintle



Marissa McBride



Jane Elith

Their experience with CEBRA conducting robust scientific research, analysis, and expert advice on national Biosecurity issues ... has provided these four outstanding people with enviable experience, making them highly attractive researchers internationally.

scanning is a way of sorting through this information and looking for trends or signals that deserve attention. It aims to alert us to these trends and signals before they take us by surprise' Dr Wintle explained.

Dr Marissa McBride has already commenced her appointment at Harvard University as Postdoctoral Fellow at Harvard Forest. 'I'm working on the *Future scenarios of landscape change in*

New England project. Scenarios research is a way of analysing the potential future effects of climate and land use change. It is another example of problem-oriented scientific synthesis, decision maker engagement and science communication' advised Dr McBride. The project will contribute to plans for the New England region, looking at different possible land-use and climate change scenarios and their consequences for biodiversity, ecosystem services and landholders.

Dr Jane Elith who is an ARC future fellow within CEBRA enjoys working with statistical models and data, focusing on species distribution models and has published extensively on improved methods for, and applications of, species distribution modelling. She is one of the ten most highly cited environmental scientists in the world. Happily, she intends to stay on at the University of Melbourne.

CEBRA STARS SHINE CONT.

Dr Elith has won five awards recently for her published work including;

- two *Recognition of achievement for a Research Paper* awards in 2015 as first author on papers that have been highly cited over the past 5 years, in the journals *Methods in Ecology and Evolution* and *Journal of Animal Ecology*.
- as one of a team receiving the 'Thomson Reuters Citation Award for significant contribution to science change research, and
- Thomson Reuters Highly Cited Researcher 2014 and 2015 – top 1%

of papers cited internationally in Ecology and Environment earning the papers the mark of exceptional impact.

All four agreed that the experience gained working with CEBRA and their open minded and forward thinking supervisors made this possible. Professor Mark Burgman, Managing Director, CEBRA said 'these four postdoctorate careers highlight the diversity of the research we undertake at CEBRA, its importance to government and business and the career opportunities working with CEBRA can open. The hallmark of this work is the focus provided

to it by the needs of policy makers in government. They set wonderful challenges, providing us with a unique opportunity to focus the energy of our best researchers where it is most needed'. CEBRA seeks out and engages the pinnacle of scientific talent. It provides opportunities to collaborate with other leading experts in biosecurity and risk to develop tools and techniques which tangibly help government and businesses to make informed biosecurity decisions.

CEBRA presents at NAPPO's Annual Meeting

CEBRA's Managing Director Professor Mark Burgman will be showcasing CEBRA's work internationally at the 39th North American Plant Protection Organization (NAPPO) Annual Meeting in Memphis, Tennessee this October.

The meeting includes a one day "Innovation in Pest Risk Management" symposium. Professor Burgman's foundation lecture will address 'Economic Impact Models and Pest Risk Management'.

NAPPO collaborates in the development of regional science-based phytosanitary standards aimed at protecting agriculture, forest and other plant resources against regulated plant pests while facilitating trade.

In Australia and New Zealand CEBRA serves the critical function of ensuring that the Australian and New Zealand

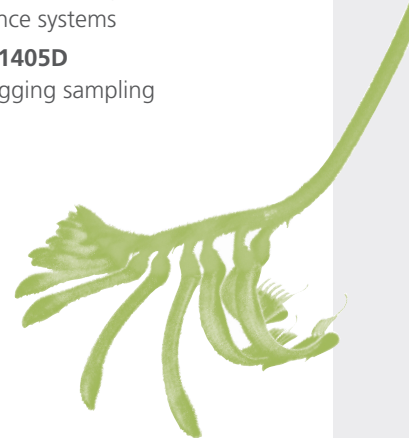
governments are at the forefront of biosecurity risk management through the provision of collaborative, relevant and practical research outcomes.

Professor Burgman's invitation to address his Canadian, United States and Mexican colleagues at NAPPO's Annual Meeting is testament to his and CEBRA's international reputation as a key opinion leader on biosecurity risk. It's an ideal opportunity for Professor Burgmann to collaborate with his colleagues on CEBRA's current and emerging research.

PROJECT UPDATE

The following projects have been endorsed by the BRSC in June 2015:

- **Project 1301C**
Improving ballast water risk tables
- **Project 1305A**
Ornamental fish import surveillance systems
- **Project 1405D**
Illegal logging sampling strategy



FEATURE ARTICLE

Optimising Surveillance Systems on Barrow Island

At CEBRA we are often operating at the intersection of economic development and the environment. Our research and the tools we develop are aimed at optimising risk management and environmental protection in an operational rather than conservation context – whether that is in relation to land management, primary production, or resource extraction.



Barrow Island

Australia is resource rich. Our extensive mineral, oil and gas reserves have underpinned a strong economy, wealth generation and high standards of living in Australia for decades.

But with many of our resources in highly sensitive ecological environments, there is a fine balance to be struck between tapping the economic benefits of resource extraction and protecting Australia's unique environmental values.

In partnership with Chevron Australia, managing environmental risks of the

Gorgon Project at Barrow Island is a great example of how CEBRA's research over a number of years is now being applied in exactly this context.

Barrow Island, a Class A Nature Reserve, lies 35 miles off the north-west coast of Western Australia. It is about 16 miles long by 6 miles wide, and its isolation has made it home to hundreds of species, many rare and endangered, and at least 24 of them unique to the island.

Throughout the six-year construction phase of the project, Chevron Australia

...with many of our resources in highly sensitive ecological environments, there is a fine balance to be struck between tapping the economic benefits of resource extraction and protecting Australia's unique environmental values

has been gathering quarantine and surveillance data on invasive species as part of a strict approvals process.

With the shift from construction into operations, the original surveillance systems are being reviewed. The review will recommend a surveillance system that optimises invasive species search and detection based on the new operating environment, as well as lessons from the last five years of surveillance and quarantine data gathered on Barrow Island.

Expert judgement was critical in informing the original surveillance model and will continue to play an important role during the review process.

CEBRA's Bonnie Wintle is managing the expert elicitation process in partnership with researchers at the Queensland University of Technology (QUT).

FEATURE ARTICLE

Optimising Surveillance Systems on Barrow Island CONT.



Barrow Island

Since 2007 CEBRA has been developing world-class expert elicitation methods, such as the IDEA protocol, which encourages Investigation, Discussion, Estimation and mathematical Aggregation. Bonnie is using these improved and more structured methods to reduce biases in the predictive models that underpin the surveillance system.

The simple premise being that more reliable expert judgments leads to more reliable surveillance, better detection of invasive species and better protection of the environment.

Thirty seven plant, invertebrate and vertebrate experts hailing from government, universities, CSIRO, private practices, museums and the CRC for Plant Biosecurity are participating in the review. The statistical models are being revised by QUT.

The output will inform Chevron Australia which species they should look for, where they should look for them and the surveillance methods they should use.

Optimisation here is the key focus – recognising that we do not operate in a perfect world with limitless budgets. In a complex natural and commercial environment such as we see on Barrow Island, biosecurity risk management and response is about doing the things that will have the greatest impact.

Ultimately CEBRA and Chevron Australia have a shared interest - we both want to keep invasive species off Barrow Island and protect the island's biodiversity.

For CEBRA, it's about bringing independence, rigor and credibility to the process. We are committed to ensuring that where economic development and

the environment intersect, companies like Chevron Australia implement practices that optimise their ability to protect the environment while we seek to grow our national prosperity.

The Gorgon Project is operated by an Australian subsidiary of Chevron and is a joint venture of the Australian subsidiaries of Chevron (47.3 percent), ExxonMobil (25 percent), Shell (25 percent), Osaka Gas (1.25 percent), Tokyo Gas (one percent) and Chubu Electric Power (0.417 percent).

