MESSAGE FROM
THE DIRECTOR

Welcome to the June edition of the CEBRA newsletter. This newsletter has for some time been a key part of communicating the work of CEBRA to a wide range of stakeholders.

A core part of CEBRA's mission is to integrate our research into the development of biosecurity risk practice, a critical feature of which is to bridge the communications gap between the academic scientific community, policy makers and biosecurity operations personnel. We probably haven't done enough to develop strategic approaches to communication. It was great to see the CEBRA communications workshop held in Canberra at Department of Agriculture last month. The Department's Jenny Barbour very ably facilitated it. Attended by Board members and CEBRA staff, this workshop is a key step in helping shape our communications strategy.

It has also been a busy start to the year. I joined Department colleagues and represented CEBRA in Rome at the Food and Agriculture Organization of the United Nations (FAO): Commission on Phytosanitary Measures, Tenth Session. Following that, I spent 10 days in Washington at the Society of Conservation Biology Retreat and visiting USDA colleagues to discuss risk based inspection systems. Finally, I went to Japan where CEBRA was hosted at events by Tokyo University and Kyoto University.

Biosecurity Workshop – Tokyo University

On the home front Tom Kompas presented results of 1304A (Cost effective surveillance of foot-and-mouth disease) and 1405C (Torres Strait risk and resources allocation project), along with revised ACERA work on Red Imported Fire Ants and Hawkweed to the National Biosecurity Committee as part of a generalized approach to determine the optimal allocation of biosecurity funding to these invasive species. I joined Tom and spoke about optimal resource allocation and priority setting for invasive plant species management. This is a great opportunity to communicate some fundamental research outcomes to an influential group of government policy makers, industry and other stakeholders.

I am also excited to report that CEBRA has been engaged on a number of new external contracts. In our project with Chevron we will work with the Queensland Institute of Technology to redesign Chevron's Barrow Island biosecurity surveillance system and

to elicit estimates of the model's parameters from a wide variety of experts. It's a chance to road test many new biosecurity risk tools. We hope it will lead to the deployment of at least some of them in wider arenas.

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

IN THIS EDITION

NEW EXTERNAL CONTRACTS

Australian Pesticides and Veterinary Medicines Authority (APVMA)

CEBRA is working with APVMA to develop a risk screening tool. If the system works as envisioned, then it may substantially improve the efficiency of the risk assessment process, providing pathways for safe, rapid assessment of low risk proposals.

Barrow Island

CEBRA has begun to develop expert judgement elicitation protocols for Chevron's Barrow Island project. The project involves a complex and detailed inspection and surveillance system for biosecurity risks. With the coming changes from construction to operation, the focus of surveillance will shift to anticipate the new risk profile. CEBRA is assisting Chevron and the Queensland Institute of Technology to engage with experts to estimate the new risks.

Red List of Ecosystems

CEBRA is involved in a new Australian Research Council Grant to develop and test rules for assessing the conservation status of ecosystems internationally. CEBRA's contribution will be to provide advice on how experts can best estimate the parameters that will contribute to the assessments.

CEBRA presentations in Japan

Mark Burgman, Anca Hanea and Cindy Hauser presented their work on biosecurity, risk models and expert judgement to the University of Tokyo on April 4.

The day-long seminar also included presentations on model-based risk analysis by several Japanese scientists from University and Government. The seminar was followed by a three day workshop in Kyoto on expert judgement and uncertainty estimation, held at the Kyoto University, and attended by Mark Burgman, Mark Colyvan (Sydney University),

Aidan Lyon (University of Maryland), Jeremy Butterfileld (Cambridge), Michael Morreau (Finland) and hosted by Yasuo Deguchi (Kyoto University). While in its early phases, this work will eventually contribute to improvements in risk estimation and qualitative risk assessment, further developing risk assessment methods in the Department of Agriculture and elsewhere.

PROJECT UPDATE

The following research project has been endorsed by the BRSC on 13 March 2015:

• CEBRA project 1301A, Data mining to improve biosecurity risk profiling. *Report on first cohort of case studies*

✱ The School of BioSciences was formed in 2015 through the amalgamation of the School of Botany and the Departments of Genetics and Zoology. CEBRA was previously part of the School of Botany.

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NEW CEBRA PROJECTS FOR 2015/16

THEME: DATA MINING

1501C: Improving Ballast Water Risk Tables

Previous ACERA and CEBRA work identified several shortcomings in the modelling approach used to develop Ballast Water Risk Tables. This project will research opportunities to improve ballast water risk assessments, including through improved reporting and analysis of factors such as sea-surface temperature data; ship movements; and species presence and range data from port monitoring surveys.

1501E: Compliance and risk based sampling for horticulture exports

This project will support CEBRA make recommendations to improve the Horticultural Export Program. CEBRA will analyse the inspection data using several approaches including combining likelihoods and empirical Bayes, and make recommendations regarding suitable mechanisms for inspection of small or multi-product consignments, and for the intervention management of low-risk pathways, using e.g. one of the CSP family of inspection algorithms.

1501F: Import Clearance Performance Measurement

CEBRA will support the Border Compliance Division develop a suite of performance indicators and the necessary infrastructure to collect the needed data. The project involves a review of current performance indicators, documentation and existing intervention practices for each regulated pathway. CEBRA will then deliver a report recommending performance indicators for each pathway, including quantitative descriptions of leakage surveys (if applicable), data and data collection requirements.

THEME: SPATIAL ANALYSIS

1502C: Estimation of national-level farm demographic data for preparedness of highly infectious livestock disease epidemics

Project 1402C developed a suite of statistical models that estimate the number of animals on farms in New Zealand from remotely sensed data at a scale that is relevant to support emergency response planning. These models have identified areas where data are sparse and where uncertainties are relatively high. The economic impacts of these inaccuracies have not been modelled, and there is no way for assessing priorities for reducing these uncertainties. Project 1502C will fill this knowledge gap.

1502D: Criteria in prioritising plant pests along the biosecurity continuum

This project is designed to address the prioritisation of plant pests for surveillance Australia. This project will review and assess methods for prioritisation in invasive species and environmental management that have been recommended or used elsewhere; identify the approach best suited to the Australian plant-pest prioritisation context; and develop a plan for identifying the most effective way of rolling out the assessment process in Australia.

1502E: Risk maps for optimising biosecurity surveillance

We will develop a spatially explicit Bayesian Network based approach to allocate surveillance effort based on risk. Empirical data are available to support an assessment of risk for some factors. We will use expert elicitation to quantify risks where no formal data is available. The model will be implemented in a geospatial environment.

NEW CEBRA PROJECTS CONTINUED

THEME: INTELLIGENCE

1503A: Intelligence gathering and analysis

International Biosecurity Intelligence System (IBIS) is a web search tool that provides real-time intelligence on emerging pests, diseases and pathogens. The next stage of research and development will focus on improved architecture for the IBIS site. The architecture will be redesigned so that the existing deficiencies are accounted for, providing the environment necessary to implement the next set of developments and improvements in the user experience.

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1503B: Intelligence tools for regulated goods traded via e-commerce

Internet commerce facilitates long distance dispersal of alien species (risk goods), but the effects of this trade are neither well understood nor documented. The magnitude of the threat is not known, and tools for managing the risk are undeveloped. The project will be a desktop exercise involving reviews of available literature and data and discussions with staff in other jurisdictions. Existing software will be evaluated against a set of functionality requirements, concentrating our efforts on assessing the software used by regulatory agencies in various jurisdictions.

THEME: BENEFIT COST

1504C-SP: Testing incentive-based inspection protocols

The focus of this phase of the project is running field pilots of proposed compliance based inspection protocols in order to give a more complete understanding of participants' responses. The field pilots will involve introducing changed protocols on two plant-product pathways and observing the responses of importers, suppliers and customs brokers. The compliance-based inspection protocols that will be rolled out arise from the theoretical work in CEBRA Project 1304C, together with any refinements suggested in CEBRA 1404C.

1504D: Using decision support tools in emergency animal disease planning and response

As an important component of disease planning and preparedness for the department, the project will report on key information that could be used in an FMD outbreak to infer the potential scale of an outbreak and information to support disease management decision-making taking into account variable objectives of control and the influence of variables such as effectiveness of measures and resource issues.

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THEME: PATHWAYS

1505A: Ornamental fish import surveillance systems

The Department has proposed changes to the way it manages the disease risks associated with imported ornamental fish. The proposed changes include the introduction of on-arrival health surveillance that will allow the department to monitor the performance of overseas authorities and exporters in meeting the health requirements for ornamental fish exported to Australia. This ongoing project (ACERA 1206G, CEBRA 1305A, and CEBRA 1405A) focuses on developing and trialling a sampling framework for the proposed surveillance program.

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