

Translating information into change.

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CEBRA
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June 29, 2017



Biosecurity is Important



- ▶ Myrtle Rust: threatens regional extinctions.

- ▶ Annual cost of invasives: \$1.4 trillion; 5% GGDP.



Biosecurity is Expensive

DAWR 2015–16 Annual Report

Outcome 2: Safeguard Australia's animal and plant health status to maintain overseas markets and protect the economy and environment from the impact of exotic pests and diseases, through risk assessment, inspection and certification, and the implementation of emergency response arrangements for Australian agricultural, food and fibre industries.

Total expenses for Outcome 2: \$664 033 000

Biosecurity is Difficult

Australian Federal
Department of Agriculture and Water Resources
2015–16 Annual Report.

Air passengers	19 000 000	270 000
Mail Articles	138 000 000	23 000
Wharf Gate Sea Container Inspections	250 000	
Vessel First-Port Arrivals	18 000	
Air Freight Consignments (< \$1000)	640 000	
Cargo units referred from Customs	450 000	

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Government department commits to science-based policy

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Policy: Twenty tips for interpreting scientific claims

[William J. Sutherland](#), [David Spiegelhalter](#) & [Mark Burgman](#)

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Policy

William J.

20 November 2013

Top 20 things scientists need to know
about policy-making

Chris Tyler

There are some common misunderstanding among scientists about how
governments make their policy decisions

Top 20 things politicians need to know about science

In the Beginning ...



Governance Model 1: 2006 (ACERA & DAFF)

- ▶ Pre-proposals outlined by ACERA and DAFF staff
- ▶ ACERA Scientific Advisory Panel reviewed and scored pre-proposals
- ▶ Pre-proposals approved by DAFF Secretariat
- ▶ Proposals developed and implemented by ACERA staff, in consultation with DAFF staff
- ▶ Independent oversight
 - ▶ ACERA Scientific Advisory Panel
 - ▶ ACERA Board
- ▶ Work carried out.

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- ▶ Work carried out.
- ▶ **Reports Duly Noted.**

Challenges

Cultural Clashes

- ▶ Mutual distrust between government and academia.
- ▶ Silos within Department impeded permeability to innovation
- ▶ Deadlines / deliverables differently defined
- ▶ Sharing drafts; Polish / format intolerance
- ▶ Behavioural norms; Dress codes / Modes of communication
- ▶ Non-response
- ▶ Staff turnover

Academic success; Regulatory failure.

CEBRA

Centre of Excellence for Biosecurity Risk Analysis

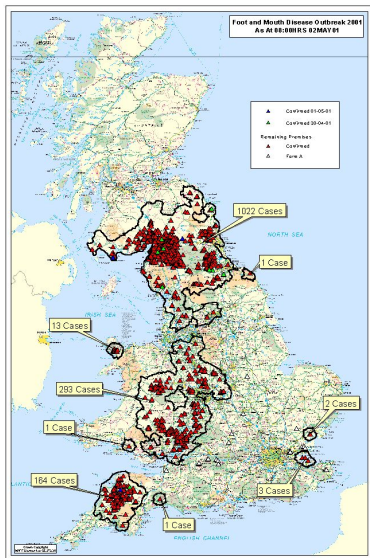
- ▶ based in University of Melbourne, School of BioSciences
- ▶ July 2013 – June 2021; follows ACERA (2006–2013).
- ▶ *Jointly* funded by
 - ▶ Australia's Department of Agriculture and Water Resources, and
 - ▶ New Zealand's Ministry for Primary Industries.
- ▶ CEBRA
 - ▶ curates proposal development *inside department/ministry*;
 - ▶ involves the user at every step;
 - ▶ focuses on delivering concrete, implementable research outcomes.

<http://www.cebra.unimelb.edu.au>

Differences

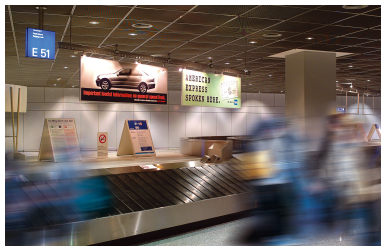
- ▶ Ideas originate with the regulators.
- ▶ There is always a Gov't co-author responsible for implementation.
- ▶ Rigorous & unpleasant PM leads to transparency.
- ▶ Changes in work program must be ratified by sponsor.
- ▶ Focus is on delivery of concrete, implementable outcomes.
- ▶ University culture supports engagement (“triple helix”).
- ▶ Performance measures: journal articles & books, of course, but also peer-reviewed reports and adoptions.

United Kingdom 2001 FMD Outbreak



- ▶ 2001 FMD in UK — cost **8 billion pounds**; **6 M** sheep & cattle (2030 tested positive!)
- ▶ Modelled for Australia — **\$7 to \$16 B**; now \$50 B.

Increased Quarantine Intervention



ACERA 0806 Risk–Return case studies: The Benefits

CEBRA provided a spreadsheet tool to the Department.

- ▶ Monitoring ULDs — 370,000 in 2008; 14,000 in 2014.
- ▶ Monitoring reportable documents — 2.7 million in 2008; 16,000 in 2014.
- ▶ Sea containers — 2 million in 2008; expanded CAL, huge reduction in non-CAL inspection; 370,000 in 2014.

Lesson Learned: imperfect inspection data.

CSP-1: Risk-Based Inspections



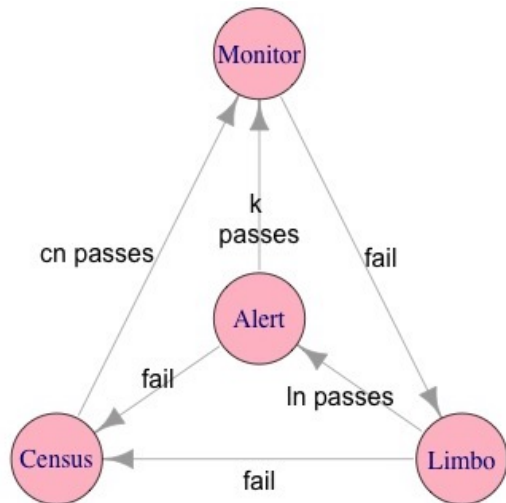
CSP-1: Risk-Based Inspections



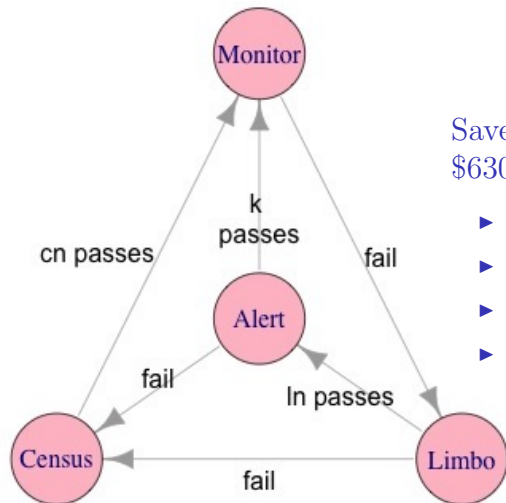
Pathway is in one of two modes: *census*, or *monitoring*.

1. In **census** mode, inspect all items. Switch to monitoring upon c consecutive passes. Start in *census* mode.
2. In **monitoring** mode, inspect $f\%$ of the items, randomly selected. Switch to enhanced upon any fail.

CBIS: CSP-3



CBIS: CSP-3



Saved: > 3500 inspections;
\$630 000

- ▶ Dried Fruit and Herbs (10)
- ▶ Fresh fruit (1 + 2)
- ▶ Nuts (7)
- ▶ Grains and Seed (3 + 11)

Lesson Learned: switch tools but not values.

Carrots and Sticks

What if this policy also affects behaviour?

- ▶ Integrate stakeholder incentives into design of rules
- ▶ Make it in stakeholders best interests to comply
- ▶ Focus on outcomes rather than how stakeholders achieve them
- ▶ Use menu of contracts to give stakeholders a choice of rule and reveal important information to the regulator

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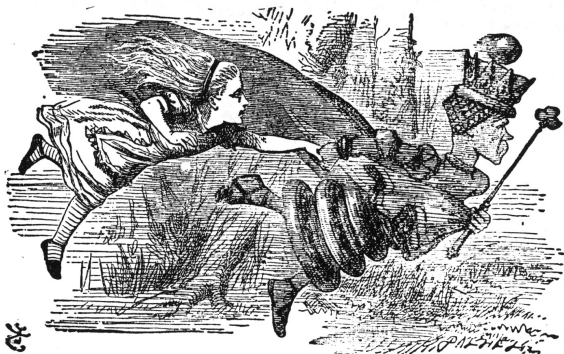
- ▶ Integrate stakeholder incentives into design of rules
- ▶ Make it in stakeholders best interests to comply
- ▶ Focus on outcomes rather than how stakeholders achieve them
- ▶ Use menu of contracts to give stakeholders a choice of rule and reveal important information to the regulator
- ▶ Use economic theory to design appropriate candidate regulatory schemes
- ▶ Draw on behavioural economics to improve operation of incentive-based schemes
- ▶ Fine-tune design through experimental testing
- ▶ Further refinement through structured pilot program

Lessons Learned

- ▶ First, listen.
- ▶ Start small — solve case studies.
- ▶ Analyze the data that you have **now**.
- ▶ Don't focus on peer-reviewed publications. They will come.
- ▶ Don't worry about the Intellectual Property.
- ▶ Visit.
- ▶ Sustain engagement.
- ▶ Deliver useful, usable outcomes; operationalise lightly.
- ▶ Build bridges inside and outside the organization.
- ▶ Manage expectations carefully.

Be patient!

Biosecurity is Wicked



Now, here, you see, it takes all the running you can do, to keep in the same place.

— The Red Queen, *Through the Looking Glass, and What Alice Found There* (L. Carroll, 1871).

Overview

Biosecurity

Important

Expensive

Difficult

Science in Policy

ACERA

CEBRA

Projects

Risk-Based

Intervention

Changing

Behaviour

Lessons Learned

