

ENVIRONOMICS

FEBRUARY 2009

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Director's Note

The financial 'crisis' of 2008 is now delivering consequences for Australian economic growth and employment levels. Forecasts of these key indicators of prosperity have become increasingly pessimistic over the last few months. So we greet 2009 with some degree of trepidation. Falling levels of economic growth have been viewed by some commentators as a god-send for the environment. The opposite is more likely. Because consumption of environmental services is a normal good, it's likely that less prosperity will mean less interest in protecting the environment. It also means less capacity to invest in environmental protection. These trends make it even more important in times of economic recession that environmental resources are used efficiently. The work of environmental economists is critical to the determination of ways in which such efficiency gains can be achieved. Perhaps nowhere more important is this work than in the provision of advice to environmental policy makers in the public sector. With governments attempting to stimulate the economy with increases in spending, the temptation is for ad hoc projects to be initiated. Helping to ensure that investments in environmental improvements secure positive net social benefits is an important role for environmental economists. 2009 will therefore be an important one for the

Protecting Australia and the environment from harmful pests



The Yellow crazy ant has had a significant destructive impact on the Christmas island ecosystem, killing and displacing crabs on the forest floor.

Making choices on how best to protect the environment requires not only relevant information and data, but also a series of analytical constructions that assist in the way in which objectives are set. Full article Page 2



The bite of a fire ant can be extremely painful

Environmental Economics Research Hub as the results of our research initiatives begin to emerge as real contributions to environmental policy making.

Over the past few months I have been working with DEWHA staff and members of the Hub's Senior Executive Group to plan changes to Project 11. This project, originally under the leadership of Dr Jack Pezzey, experienced some difficulties in staff recruitment that required a change in direction. Frank Jotzo (ANU) and Regina Betz (UNSW) developed a number of new 'sub-projects' that have now been approved by the Department. They are:

1. Australia and international climate change mitigation commitments: applying game theory (Frank Jotzo and Peter Wood, ANU)
2. Modelling the international diffusion of carbon intensity reducing technology (Frank Jotzo and David Stern, ANU)
3. Modelling the potential interactions between the Australian 20% Renewable Energy target and the Carbon Pollution Reduction Scheme within the Australian National Electricity Market (Regina Betz, UNSW)

Frank will also take over the leadership of Project 11.

On-going discussions with the Hub SEG and staff of the Department are also focusing on the development of a number of new projects that will be funded under the Hub's "Emerging Issues" fund. The intention is to initiate these projects in coming months.

There is no doubt that 2009 will bring many exciting challenges for members of the Hub! I wish all involved a fruitful year.



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Protecting Australia and the environment from harmful pests , from Page 1

Making choices on how best to protect the environment requires not only relevant information and data, but also a series of analytical constructions that assist the way in which objectives are set. This EERH project on biosecurity

seeks to determine how and to what extent resources should be used to monitor, prevent and manage potential incursions of exotic pests and diseases, especially those that can bring substantial (occasionally catastrophic) damage to the environment and local habitat. In some cases this is simply an exercise in optimal quarantine activities, or how much to spend at the border to prevent such unwanted incursions. However, in many cases border quarantine is not enough. Pests slip through even the most careful screens, and in many cases they don't even bother to pass through customs! Papua Fruit Fly in Northern Queensland is a good example: it hops from island to island until it reaches Australia. In these cases, the issue is not one of border quarantine, but how much to spend on surveillance measures -- in the local environment -- to ensure early detection.

There is another category of concern: effective control measures against a pest or disease that we know is already here in Australia, one that can potentially spread to other parts of the country. An example of this sort of incursion and its harmful effects is the accidental introduction of yellow crazy ants on Christmas Island. The crazy ant has had a significant destructive impact on the island's ecosystem, killing and displacing crabs on the forest floor. Super-colonies also devastate crab numbers (famously) migrating to the coast. This has seen a rapid depletion of land crab numbers which are vital to Christmas Island's biodiversity, a key species in forest ecology. Nothing can be done now to prevent the incursion of crazy ants on Christmas Island. The question is now how much should be done to eradicate, or attempt to eradicate these crazy ants, and how much should be spent on quarantine and surveillance activities to prevent and monitor incursions and spreads of this nasty pest to other parts of Australia.

This project sets out new modeling techniques to answer many of these questions, and then applies these models to specific cases of concern in Australia. How much to spend on quarantine and surveillance, in general terms? In principle, there will be cases where the disease or pest is so devastating that the direct costs of an incursion and spread will require vast expenditures on quarantine and surveillance activities. On the other hand, for some pests and diseases, reducing the risk of an incursion to zero may imply that the cost of the quarantine and surveillance measures is reasonable, while still allowing for the (perhaps slight) possibility of an incursion. Once an incursion has occurred, as in the case of yellow crazy ants on Christmas Island, the issue becomes one of how to best manage the containment and possibly eradicate the pest. Eradication is the preferred outcome only in cases where potential damages from the disease or pest are extensive. With containment it is often preferable to allow some limited environmental impact, balancing costs and benefits.

The first stage of this project has been to develop 'jump-diffusion' models of pest spread and control, allowing for normal random spread patterns given an incursion, along



Prof. Tom Kompas,
ANU

with large jumps in environmental state variables. The first two applications -- used to get the modeling framework running, tested and calibrated -- do not have direct environmental impacts: (1) optimal border quarantine measures against an Ovine John's incursion to sheep in Western Australia, and (2) optimal surveillance against a potential Papua fruit fly incursion in Queensland. These are done.

Using this modeling context, the last two applications in the project will tackle the issue of recreational and environmental costs and benefits head on: (1) the control and local surveillance against red imported fire ants in Queensland, and (2) the eradication (along with preventing their spread to the rest of the Mainland) of crazy ants on Christmas Island. Everyone knows how devastating crazy ants have been, but the loss in recreational values of getting bitten by a fire ant is just as real, and very painful! Professor John Rolfe at Central Queensland University, and his team, will help establish these recreational and environmental values, and when combined with the 'jump-diffusion' modeling context will provide a world-class example of how to model, cost and control the potential entry of these harmful pests and their effects on the environment.

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Establishing water markets in Northern Australia: a study to access feasibility and consequences of market-based mechanisms of water delivery - **Professor Quentin Grafton, ANU**

Professor Quentin Grafton has recently been funded through Charles Darwin University (CDU) and Northern Australian Indigenous Land and Sea Management Alliance (NAILSMA) to work with the TRACK, NAILSMA and CDU teams on a two year project looking at northern water markets.

This research will examine the potential effectiveness and durability of water markets in tropical Australia, how the transition to market-based allocation may interact with existing institutions, and the potential socio-economic impacts arising from an open trading market.

The research will analyse:

- * current institutional arrangements for establishing water markets across Queensland, NT and Western Australia;
- * key stakeholder attitudes and values relating to water trading and consideration of the implications for the establishment of markets;
- * the costs and benefits of introducing water trading to northern Australia ensuring consideration of efficiency, effectiveness and equity criteria.

The principal outcome sought from the research is better informed policy-makers, regulators and water users regarding the role of markets in managing entitlements, including understanding of constraints and approaches to their resolution. Issues given particular attention will include Indigenous entitlements in water and their status in markets, non-market institutions in place to protect environments, transitions to efficient markets in presently under-allocated systems and the likely character/behaviour of markets in these circumstances.



Professor Quentin Grafton, ANU

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2009 Annual EERH Workshop

The 2nd Annual Environmental Economics Research Hub Workshop is being held on Tuesday 10 February at the Sebel Cairns Hotel in conjunction with the Australian Agricultural and Resource Economics Society (AARES) Conference as a pre-conference workshop.

Three guest speakers will present papers: Stale Navrud from the Department of Economics and Resource Management, Norwegian University of Life Sciences; Steve Hatfield-Dodds from Department of Climate Change; and Axel Michaelowa from the Institute of Political Science, Zurich University

Stale will speak on Non-Market Valuation: how reliable are meta analyses for international benefit transfers. Steve will consider Australian Climate Policy, and Axel will ask, What future for the clean development mechanism?

We are delighted to join with AARES on this occasion and look forward to a good turn out at the workshop which will also provide projects updates and time for discussion on important issues such as the design and implementation of an Emissions Trading Scheme.

Conference details can be found at: <http://www.alloccasionsgroup.com/AARES09> All presentations will be made available on the Hub website after the Conference.

HUB THEME LEADER CONTACTS

Theme A.

Establishing viable markets to achieve environmental goals

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Theme C.

Advancing Australia's capability for social and economic analysis of environmental issues at the regional scale

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Theme B.

Climate change analysis

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Theme D.

Valuing environmental goods and services

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Introducing Kasia Masur

Kasia's project is part of Hub project Community Values for Catchment Management. She has two papers on the Hub website written with Jeff Bennett.

Kasia's background is in agriculture and environmental economics. She finished a master's degree in agricultural economics from the University of Agriculture in Krakow (Poland) 2000, and worked in the Agricultural Bank in Poland as an economist before she immigrated to Australia in 2002. She pursued her career in agricultural economics further by joining the Agricultural Economic and Policy Unit with the Queensland Department of Primary Industries in Brisbane in 2003. During this time she explored broader agricultural issues in Australia and this drew her interest into the parallel discipline of environmental economics. In 2005 Kasia finished her Master of Natural Resources Economics at the University of Queensland (Brisbane) and she joined the Natural Resource and Agriculture Unit with the Australian Bureau of Agricultural and Resources Economics (ABARE) in Canberra. In August 2007 Kasia enrolled in a PhD at the ANU in the Crawford School of Economics and Government under the supervision of Professor Jeff Bennett.

Her research project is embedded in one of the EERH projects (Community Values for Catchment Management). The objective of her research is to explore the application of Choice Modelling to estimate the values held by residents of NSW for a range of environmental benefits provided by potential NRM strategies in three NSW catchments (Namoi, Lachlan and Hawkesbury-Nepean). Key methodology issues include: scope and scale effects, and the incentive compatibility of choice experiments.

The obtained non-market values will be used for integration into the bio-physical modelling constructs of MOSAIC (an integrated spatial optimisation model developed by ABARE with NSW Department of Environment and Climate Change) to identify the areas and NRM actions that can provide the greatest net benefits to NSW society. The results of the study will assist NSW Catchment Management Authorities (CMAs) with prioritization of their Natural Resource Management investments.

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