



# Environmental Economics Research Hub

## Hub Project Outcomes July 2009



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**Australian Government**  
**Department of the Environment,  
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### **Project 1: Consumption-based water pricing and price-elasticities**

#### **Outcomes:**

Advice on water pricing that is useful in sustainability and water planning in the ACT and other OECD countries.

The research has been delivered to approximately 60 mid-ranking and senior public servants in the Department of Environment Water, Heritage and the Arts via a professional/executive course.

Training with the World Bank Institute (in China) and UNESCO (in Latin America) to provide knowledge transfer and capacity building to public servants in developing countries.

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### **Project 2: Estimating protection values at general and case study levels**

#### **Outcomes:**

A set of transferable values for use in Cost Benefit Analysis of protection measures for the GBR.

Values in the cost benefit analysis which can be adjusted for a variety of factors such as:

1. The scale of the protection being considered (local, regional or all GBR)
2. The broad type of management change involved (water quality, conservation zone or climate stabilisation)
3. The level of risk and uncertainty associated with different outcomes.

Evaluations of options for reducing greenhouse gas emissions using information about community preferences and values for different risks and management strategies.

Best practice guidelines for the application of choice modelling to assess protection values.

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### **Project 3: Economically efficient strategies for the conservation of Australian biodiversity**

#### **Outcomes:**

An economic model which predicts the opportunity cost of moving land into protected status, as a function of location and bio-physical attributes.

A theoretical analysis of the cost-effectiveness of various conservation incentive mechanisms, such as payment by conservation outcome, payment by conservation input, land use restrictions, penalties for ecological damage, open-market land purchase, and auction mechanisms. The analysis will focus in particular on the roles of both scientific and economic uncertainty.

A conservation-targeting model which will yield a cost-efficient supply curve for long run conservation of plant species in Australia.

Estimates of the economic cost of dryland salinity and of the economic impacts of climate change on Australian agriculture as a bi-product of the opportunity cost analysis.

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### **Project 4: Designing metric assessments for biodiversity tenders**

#### **Outcomes:**

Better information to allocate funding for improving water quality, with identification of the costs of sediment, nutrient and pesticide reductions in GBR catchments from water quality tenders.

Case study showing how a cost-efficiency metric generates better resource allocation of public funding than a simple project scoring or criteria approach.

Metrics for community values of water quality improvement outcomes on the Great Barrier Reef, allowing outcome values to be matched to input changes and better investment decisions.

Pilot demonstration of a cost benefit metric (incorporating community values) in comparison with a cost-efficiency metric for water quality improvements in the Burdekin.

Easier applications of cost benefit analysis with the development of meta analysis approaches to provide systematic benefit transfer functions for valuing water-related issues in Australia.

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### **Project 5: Designing marine reserves for biodiversity and sustainable fisheries**

#### **Outcomes:**

A guide for the ex ante evaluation of marine protected areas.  
Results that will feed directly into the National Climate Change Adaptation Research Network for Marine Biodiversity and Resources. This network will build adaptive capacity and adaptive policy response strategies for the effective management of marine biodiversity and natural marine resources under climate change.

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### **Project 6: Environmental values and valuation over time**

#### **Outcomes:**

Estimates of the non-use values arising from the existence of a protected natural area that will improve the efficiency of resource allocation to the protection of natural environments such as National Parks, Nature Reserves and private reserves.  
Estimates of the long term variation in community preferences for the environment that will improve policies that have long running consequences for the condition of the environment.  
Conceptual advances in stated preference methods that will facilitate the use of non-market valuation techniques in policy making.  
Training activities will graduate one PhD qualified and experienced to undertake non market valuation studies.

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### **Project 7: Integrating community preference into vegetation planning processes**

#### **Outcomes:**

A data base of value estimates for environmental and social impacts of natural resource management actions in NSW and Tasmanian Catchments that will improve the efficiency of allocations of scarce resources to investments in catchment natural resource management.

Reduced costs of decision making within NSW and Tasmanian Catchment Management Authorities and the NSW Department of Climate Change.

Improved community relationships for the management agencies through the use of public consultation derived information and increased speed of catchment resource management decision making through the improved used of the benefit transfer process.

Conceptual advances in stated preference methods that will facilitate the use of Choice Modelling as a tool of non-market valuation in natural resource management decision making and in broader policy settings at state and federal government levels.

Training activities will graduate two PhD's qualified and experienced to undertake non-market valuation studies.

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### **Project 8: Divergence between community and expert valuation of ecosystems**

#### **Outcomes:**

Identified cases showing where experts and the community hold divergent preferences for the protection of key components of the environment.

Estimates of conservation values for use in Cost Benefit Analysis in government policies regarding environmental management at different scales:

- i) specific asset (Ningaloo reef)
- ii) specific asset type, broad scale (Kimberley surface water features)
- iii) multiple asset type, broad scale (Southwest Australia Ecoregion).

Identification of the need for policy makers to utilize tools capable of collecting and integrating public preferences into decision processes rather than relying wholly on scientific opinion and proposals.

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### **Project 9: Salinity, uncertainty and property rights**

#### **Outcomes:**

Appropriate incentive systems, such as group-performance based payments that will better ensure that collective salinity targets are met.  
Effective policy design for salinity cap and trade, to reduce the cost of salinity mitigation.  
Investments in the Murray-Darling Basin that will improve resource allocation efficiency.

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### **Project 10: Adaptation and economic responses to climate change**

#### **Outcomes:**

Better understanding of options and requirements for economic policies for adaptation to climate change (examples: ongoing and future work on water licence buybacks, real options for adaptation, and economic effects of past episodes of environmental change).

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### **Project 11 – Improving Australia’s energy efficiency through faster development and adoption of technologies**

#### **Outcomes:**

Contribution to the design of Australia's emissions trading scheme and complementary policies. Applications include research on industry assistance, price caps and other features of emissions trading; research on energy efficiency and diffusion of technological change; and on renewable energy policies in particular the renewable energy target and the case of wind power integration in South Australia.

Informing Australia's strategy in international climate policy and negotiations.

Applications are analysis on international linking of emissions trading and policies in the Asia-Pacific; and research on countries' proposals for commitments including through game theoretic models.

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### **Project 12: Socio-economics of on-farm renewable energy**

#### **Outcomes:**

Analysis on whether different approaches and different farm-waste materials are viable in the production of bio-fuels.

Tests of the viability of different approaches and different farm-waste materials to the production of bio-fuels.

New biofuel businesses --not needing taxpayer subsidies.

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### **Project 13: Designing environmental policy for Australia from an economic and social perspective**

#### **Outcomes:**

Assessment of the effects of different design choices (such as allocation, auction design, sanction design, coverage, future vintage trading) on the efficiency and effectiveness of emissions trading schemes. The different design options which are tested e.g. by using experiments, reflect Australian-specific design choices and will help policy makers to understand the implications of those design choices.

Issues for linking Australia's Carbon Pollution Reduction Scheme with other existing (EU ETS, NZ) or emerging emissions trading schemes (US) are analysed, which advise policy makers on the critical design issues with regard to linking. This is crucial in building a regional or global carbon market.

Development of an Additional Action Reserve approach to account for greenhouse gas mitigation action beyond the CPRS. This work is relevant for the current debate on voluntary action.

#### **Contact:**

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### **Project 14: The benefits and costs of biosecurity**

#### **Outcomes:**

Improved planning for Plant Health Protection

Input to the National Biosecurity Committee, CBA Working Group, a combined government initiative, designed in particular to bring biosecurity concerns of DEWHA and DAFF together. This Working Group will help set the standard for all CBA work on biosecurity in Australia.

Establishment of the methodology for CBA on biosecurity in Australia and the methods for environmental valuation.

The establishment of AC-BEE. This centre will be the leading research and policy action group on the economics of biosecurity in Australia.

A method of environmental valuation for regional areas in Australia, with an example case study of a Crazy Ants incursion.

#### **Contact:**

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### **Project 15: Learning from the Irrational: A study of Environmental Preferences**

#### **Outcomes:**

More available information regarding dam levels and consumption relative to targets and formal water restrictions in domestic water consumption and whether non-economic targets influence water consumption levels.

Reduced freshwater consumption at minimal social and economic cost.

A paper on myopic behaviour in natural resource extraction will assist policy recommendations regarding optimal length of mining issues and other issues surrounding the extraction of (non-)renewable natural resources.

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### **Project 16: Valuing Ecosystem Services in Agricultural Production**

#### **Outcomes:**

A conceptual paper which will allow identification of ecosystem services of value to agricultural production. This will allow policy makers to understand better when and which farmers are among the stakeholders which benefit from policies which help to maintain certain ecosystem services.

An estimation of the value of salinity prevention in Western Australia using a methodology reproducible for other areas and ecosystem services.

#### **Contact:**

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### **Project 17: Waste Policy: materials management and recycling**

#### **Outcomes:**

A conceptual model of waste policy will inform and improve government decision making processes.

Estimates of values associated with the environmental impacts of alternative waste management strategies will be available for use in cost-benefit analyses of future government decisions.

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### **Project 18: Marine Biodiversity**

#### **Outcomes:**

Estimates of the value of marine biodiversity in Australia's temperate waters will be available for use in cost-benefit analysis of government policy initiatives including the declaration of marine reserves and commercial fishing restrictions.

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### **Project 19: Heritage Values**

#### **Outcomes:**

A conceptual model of heritage protection policy will inform the development of improved government decision making.

Estimates of heritage values will be useful in cost benefit analyses of alternative public policy strategies regarding the protection of Australia's build heritage.

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### **Project 20: Value of biological collections**

#### **Outcomes:**

A conceptual framework will assist government and those responsible for existing biological collections to form management strategies and future policy.

Value estimates for various types of benefits arising from Australia's biological collections under alternative management scenarios will be useful in cost-benefit analyses of different government policies.

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## Environmental Economics Research Hub

This work has been funded through the Environment Research Facilities Program (CERF) Program, an Australian Government initiative supporting world class, public good research.

The Environmental Economics Research Hub brings together leading economic and social scientists to look at new and improved ways of valuing environmental assets and determining the benefits and costs of different actions. This work extends across terrestrial and marine biospheres. The overarching focus of the research hub is to develop economic models and tools, especially for policy makers. It employs leading edge economic principles and practices to address key environmental policy issues such as the design of marine reserves, development of incentives and tools for improving water efficiency, policies for promoting environmental stewardship, multi-species and ecosystem management for biodiversity, and adapting to climate change.

For further information, see

[http://www.crawford.anu.edu.au/research\\_units/eerh/index.php](http://www.crawford.anu.edu.au/research_units/eerh/index.php)

<http://www.environment.gov.au/about/programs/cerf/>



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