

CASPI: NEWS

Climate Adaptation - Science and Policy Initiative September 2007



CASPI at Work

September has been another busy month for the staff and associates of CASPI, carrying out commissioned work and preparing project proposals. Two projects in particular relate to work for the Garnaut Review, which is looking at the likely effects of human induced climate change on the Australian economy.

The Science of Climate Change

CASPI has been engaged to write one of the components in the Garnaut Climate Change Review that will address the science of climate change. This piece of work will provide a reliable and up-to-date summary of the scientific evidence for climate change based on a synthesis of existing scientific literature, including the latest IPCC reports and the most recent information of particular relevance to Australia. The final report will be submitted early in October.

Emissions Stabilisation

The second project, which CASPI has just been awarded, concerns emissions stabilisation. This five week project will begin in October. It will consider the issue of greenhouse gas stabilisation targets, including consideration of different emissions scenarios and target concentration levels. These scenarios are required as an input to economic modelling as well as addressing concerns about dangerous levels of climate change that may result from excessive emissions. CASPI will be working closely with Professors Ian Enting and David Karoly on this project.

Emissions Growth

Although the total growth in Australia's direct greenhouse gas emissions over the period 1990 to 2005 was only 2.2%, this growth was only contained by reductions in one sector of the economy, Agriculture, through one-off changes in land clearing. Emissions in Electricity, Gas and Water grew by 46.9%. This sector is estimated to be the largest single source of direct emissions, accounting



for 35.6% of Australia's emissions. The Services, Construction and Transport sector emissions grew by 23.7%, while Residential emissions grew by 28.6%. (Source: <http://www.greenhouse.gov.au/inventory/2005/economic-sector.html>)

If we contrast these growth rates with discussion around the need to reduce greenhouse gas emissions by anywhere between 60 to 80% or even 100% below 2000 levels by 2050, it would seem the trends are completely opposite to that needed in order to curtail emissions that otherwise may result in dangerous climate change.



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Courtesy: Kathy Crane, NOAA, Arctic Research Office

Record Arctic Ice Minimum

A new record minimum area for Arctic sea ice has been set this year, continuing the downward trend of the past 30 years. The decline is more than double that between 2002 and 2005.¹

September marks the end of the Arctic melt season. Models have shown declining Arctic ice cover, but none or very few model simulations show trends comparable to observations. The current summer minima are approximately 30 years ahead of a range of simulation model forecasts. For the "business as usual", SRES A1B scenario, an ice free Arctic Ocean might be achieved from 2050 to 2100 or beyond. It

would seem the models are underestimating what is being observed, and a new Arctic ice state is likely to be achieved well within this century. This region has been expected to be especially sensitive to greenhouse warming and feedback effects, and this sensitivity may turn out to be greater than many current models suggest.²

1. The Age Record Arctic ice melt causes alarm 22 Sept 2007
2. Stroeve, J., et. al., "Arctic sea ice decline: Faster than forecast" *Geophysical Research Letters*, 34, L09501, 2007.



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Predicting and monitoring climate change in insects

Prof Ary Hoffman and his colleagues have recently won one of the Commonwealth Environment Research Facilities (CERF) Significant Project grants. Their research will look at the threats and risks to our environment by addressing the key issues of climate change and its effects on invasive species. The models developed in this project will have wide applicability to invasive species that both vector disease and threaten our native biodiversity and agriculture. It will provide a method from which risk assessment analyses can be conducted on any invasive species. The use of genetic markers to quickly identify species at risk from climate change will in turn provide understanding of the threat to our biodiversity before it becomes threatened by extinction.



drosophila flies

Species responses to climate change will include range shifts, persistence (where changes fall within species' tolerance limits), adaptation or extinction. All of these responses involve evolutionary/genetic processes. To manage these responses, it is crucial that we identify species most at risk from climate change before they become threatened by extinction, and then implement appropriate management strategies. We also need models that link the traits of the organism (rather than its distribution) to GIS data to predict their distribution. The research will use genetic markers as a powerful means of monitoring the early impacts of climate change on species distributions and abundances and identifying such groups. These mechanistic models will also be used to predict the likely spread of the

dengue fever transmission vector, *Aedes aegypti*, under climate change. The project identifies key mosquito traits that determine its distribution and evaluates the potential for evolution to change these traits and further expand the *Ae. aegypti* distribution. The research program will lead to the discovery of genes indicative of adaptive potential well beyond the experimental system proposed. The approach developed in this research will serve as a template for predicting changes in disease vectors and agricultural pests. It also serves as a template for rapid genetic approaches in screening threatened species.

Climate Change Adaptation Research Facility

The CCARF will be hosted by a leading science institution and will lead the research community in a national interdisciplinary effort to help government, industry and community decision makers manage the risks from the potential impacts of climate change. Australian Government funding of up to \$50 million over five years will be available to support the work of the Facility.

The University of Melbourne has partnered with the ANU, UNSW and Monash to submit a proposal for this Facility. If the bid is successful, CASPI steering committee member Prof Snow Barlow will be a Deputy Director of the new Facility. Prof Barlow has said that interviews of three group bids took place on 10th September. An internal departmental decision was due on the 21st, with an official announcement from Minister Malcolm Turnbull due by September 28th.

See the AGO website for details: <http://www.greenhouse.gov.au/impacts/about.html#proposals>



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Conference Call: Climate Change and Social Justice

The Social Justice Initiative
University of Melbourne
April 3-4, 2008

This conference will explore the social justice implications of climate change. The conference will bring together a range of interdisciplinary approaches to perspectives on social justice and climate change and raise new perspectives on the impact of climate change. The conference will explore the social justice implications of both the impacts of climate change as well as the impacts of responses to climate change. It will consider questions such as: What are the health implications of climate change? Who is responsible for paying for the costs of reducing greenhouse gas emissions and the costs of adaptation? Should institutions or individuals bear the burden of these costs? What will be the impacts of climate change on developing countries, and what does this mean for Australia? What are some of the likely economic impacts of climate change, and will these disadvantage the poor? What do we owe future generations? Is adapting to climate change likely to violate human rights? How are decisions about adaptation to climate change to be made? Who will participate in the decision making process?

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Events

* 31 Aug-1 Sep - Transported: Collective Transport Sustainable Cities

* 19-23 September - Conference on Spatial Information Theory - COSIT

* 9-11 January 2008 - Workshop on Hydrologic Prediction: Modelling, Observation and Data Assimilation

Details: www.caspi.unimelb.edu.au

Related Sites

ACSIS: www.acsis.unimelb.edu.au

VEIL: www.ecoinnovationlab.com
www.sustainablemelbourne.com

Please forward any comments, suggestions, and information about related events to:

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