

# Climate Change Adaptation Research Grants Program

## - Social, Economic and Institutional Dimensions Projects

### **Project title:**

Assessing the potential for, and limits to, insurance and market-based mechanisms for encouraging climate change adaptation.

**Principal investigators:** Professor John McAneney

**Lead organisation:** Macquarie University

### **Objectives:**

1. Review the capacity of the insurance sector to deal with increasing cost of catastrophe risks in a warming world
2. Review the successes and failures of government involvement in insurance markets and identify policy options for encouraging climate change adaptation outcomes in an effective, efficient and equitable manner
3. Explore the capability of capital market instruments and insurance-linked securities to deal with legacy issues posed by concentrations of development in areas of very high-risk to riverine flood, bushfire and storm surge
4. Propose a government regulatory framework that will encourage the insurance industry to play a positive role in increasing the resilience of communities in recovering from catastrophe weather risks in a warming climate.

### **Project design and methods:**

The overall research strategy is for a study that can be completed within a single year. The project will begin with an analysis and review (Review 1) of recent natural hazard event losses in Australia in the context of historical losses and climate change and the likely loss potential if flood were to be insured in the same manner as are other natural perils. It will also examine the capacity of the insurance market to deal with this increasing risk. Since much of Australian catastrophe risk is transferred to the international reinsurance market, this analysis cannot be purely focussed on Australia. Australian direct insurers are also exposed in different degrees to risks outside of Australia as evidenced by the New Zealand earthquakes in 2010 and 2011. A further examination will assess whether or not the Brisbane 2011 flood did represent a market failure and if so the various reasons for this. Market failure or its perception might argue for the intervention by government in the insurance market in some form. We will examine the degree to which future Brisbane scenarios might be addressed through government intervention in ways that foster climate change adaptation.

Contemporaneously, we will examine a number of government insurance schemes, particularly those in the USA such as the Federal Emergency Flood Management Agency, the Texas Wind Storm Association, the Californian Earthquake Authority, the Citizens Property Insurance Corporation in Florida and the Florida Hurricane Catastrophe Fund (Review 2). Many of these institutions have lessons, both positive and negative, for Australia. In addition Risk Frontiers will review work undertaken at the Wharton School (Dept. of Decision Sciences, Business and Public Policy) by Professors Howard Kunreuther and Erwann Michel-Kerjan, who have also worked in this domain and with whom Risk Frontiers has professional links.

A case study on the suitability of a catastrophe (cat) bond for flooding on the Hawkesbury Nepean (HN) system catchment will be undertaken and the applicability of such instruments to bushfire and storm surge. We shall also consider the appropriateness of such market instruments to the Brisbane-Ipswich (BI) flood risk, although the management of upstream dams and thus the return period of a flood trigger may complicate this analysis. These are complex and sophisticated analyses but Risk Frontiers and Aon Benfield have the in-house tools and research skills to solve this problem.

The results of the above will be used to inform policy initiatives that foster climate change adaptation for location-specific, extreme weather-related perils. Results will be presented to NCCARF, senior management in the insurance industry and policy officials in various levels of government including local councils affected by the Hawkesbury-Nepean catchments and the Brisbane River.