NATURAL HAZARDS, IMPACTS AND CLIMATE CHANGE

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ABSTRACT

As natural disaster losses have risen worldwide so too has concern that anthropogenic climate change might be contributing to this trend. This thesis tests the ongoing validity of consensus statements from a 2006 workshop dedicated to this issue. It presents new analyses that explore current and projected relationships between weather-related natural disaster losses and climate change (natural variability and anthropogenic).

Analyses of a variety of natural disaster loss databases – Australian weather-related insured losses; building damage due to Australian bushfires, and the economic losses from US tropical cyclones – and a review of other recent tropical cyclone loss studies, support the 2006 workshop consensus statements and contribute to current consensus statements. These include: that societal change and economic development are the principal factors driving the increasing trend in natural disaster losses and it is not possible to determine what portion might be attributed to anthropogenic climate change; in many regions socioeconomic factors will be the main drivers of future increases in economic losses, at least for tropical and extratropical storms, and that the detection or attribution of anthropogenic climate change signals in economic loss data is extremely unlikely to occur over periods of several decades, at least for US tropical cyclone and global weather-related natural disaster losses.

The results have important implications for policy aimed at minimising future losses. Policy responses need to consider and respond to multiple drivers of change. Employing both mitigation and adaptation contemporaneously will benefit society now and into the future. There is much to be gained in both the short and long term from reducing societal vulnerability to natural hazards and improved building standards and better land use planning are key ways to achieve this. In the absence of effective policy, future losses in many regions will rise rapidly due to expected societal changes and economic development. Anthropogenic climate change effects may exacerbate this trend.

While the extreme impacts that natural hazards inflict on society capture public interest, difficulties with detection and attribution of anthropogenic climate change signals in natural disaster loss data means that there are far better justifications for action on greenhouse gas emissions.

STATEMENT OF CANDIDATE

I certify that the work in this thesis entitled "**Natural Hazards, Impacts and Climate Change**" has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree to any other university or institution other than Macquarie University.

I also certify that the thesis is an original piece of research and it has been written by me. Any help and assistance that I have received in my research work and the preparation of the thesis itself have been appropriately acknowledged.

In addition, I certify that all information sources and literature used are indicated in the thesis.

Ryan Peter Crompton (30581621)

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