NATURAL HAZARDS, IMPACTS AND CLIMATE CHANGE

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This thesis is presented for the degree of Doctor of Philosophy
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12 June 2012
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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)

12 June 2012
ACKNOWLEDGMENTS

It is not the destination, but the journey that matters most and I am extremely fortunate and privileged to have met, learnt from, been inspired by and formed friendships with many remarkable people along my path of learning to date.

Firstly I would like to thank my principal supervisor Professor John McAneney and my adjunct supervisor Professor Roger Pielke Jr. for exchanging ideas, always backing my ability and their advice and judgment that I value so highly. I greatly appreciate them giving me opportunities to communicate my research and opening the door to a broad range of expertise. One of the most important things that I have learnt from them is the merit of the Blaise Pascal quote “I would have written a shorter letter, but I did not have the time.”

I thank Professor Andy Pitman and Associate Professor Neil Holbrook for encouraging me to pursue a research degree. I am also very grateful for their support and advice offered during and after my undergraduate studies.

Special thanks to Stan Francuz who made an immeasurable contribution as my only high school mathematics teacher. I have sincerely enjoyed his friendship from that time.

It is a pleasure to have those at Risk Frontiers as colleagues and I have greatly benefited from being a part of this special, sharing and unique group. I have also had many helpful exchanges with other colleagues from academia and industry.

Thanks to the staff at Harrison Main and McArthur who have been so welcoming and have made working remotely all the more enjoyable. Financial support during my thesis was provided by my employer Risk Frontiers and a Higher Degree Research Project Support Fund.

I would not have achieved what I have to date without such an amazing family. My brother and sister have been a source of continual support, as have my mum and dad, who always put the interests of their children ahead of themselves to give us every opportunity they possibly could. Finally, I thank my beautiful wife Katie, for her patience, love and support over many years.

I dedicate this work to Katie and our adorable children.