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## PHD PROGRESS REPORT 2015

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Recent Australian floods have put a focus on the capacity of emergency management (EM) agencies to cope with 'rapid onset or sustained large scale emergency events' (Comrie 2011). Future flood scenarios suggest such events will become more common. Implementation of the most effective approaches will minimise demands on EM agencies.

Floods are not only relevant to community safety but have strong sectoral linkages with water security and drought management, water quality, natural resource based industries, environment and economic development. To adapt to climate change, Australia needs to maximize the benefits of large and small floods, while minimizing the adverse consequences of large floods.

My thesis is expected to be a thesis by compilation (of published work). Results of my research to date are contained in the following publications:

Wenger, C., Hussey, K., Pittock, J., 2013, 'Living with floods: Key lessons from Australia and abroad', National Climate Change Adaptation Research Facility, Gold Coast, pp.264.

This paper investigated the Queensland and Victoria flood inquiry findings (post-2011 floods) to determine whether they offered lessons to aid climate change adaptation. Findings were structured using the PPRR framework. The report also compared Australian approaches to flooding with approaches used overseas, using comparative case studies from China, the Netherlands and the United States. The report found that Australian reviews were backward-looking at the event just passed and failed to consider future threats such as climate change. It found there was significant room for improvement in flood prevention.

In contrast, climate change related flood threats were a primary consideration of overseas review processes and this has influenced recent flood management strategies. Overseas strategies have moved away from hard infrastructure approaches to flood mitigation. While such measures continue to be used, there has been a shift towards 'room for the river' strategies instead of 'control' the river. This is associated with measures such as relocation, housing design, flood-compatible land use and livelihoods, ecosystems based approaches and basin-scale integrated water resource management.

Wenger, C., 2013, *Climate change adaptation and floods: Australia's institutional arrangements*, National Climate Change Adaptation Research Facility, Gold Coast, pp. 65.

Focusing on prevention, this paper explores the institutional arrangements for flood management in eastern Australia and identifies barriers to the adoption of adaptive approaches. This is important for determining the transferability of adaptive policies, a theme of subsequent work. Legislation and provisions have changed rapidly since the publication of this document, which was therefore designed as a 'snapshot in time' case study. However, institutional barriers, such as the conflict between economic incentives to develop, the need for affordable housing and the need for community safety remain relevant. The paper also touches on the potential for using ecosystems based approaches in Australia (used overseas).

Wenger, C. 2014. 'Sink or Swim: alternative approaches to flood disaster reconstruction and mitigation', in *River Basin Management in the Twenty-First Century: understanding people and place*, (V. Squires, H. Milner and K. Daniell, editors), CRC Press, Boca Raton, Florida, pp. 418-445.

This is a book chapter that looks at the implementation of adaptive flood management options in Australia, in particular, relocation policies and funding. It compares Australian programs and incentives with those of the international case study countries to find out why it is easier to achieve relocation overseas than it is in Australia. It also looks at some recent positive examples of relocation in Australia and what made them successful.

Wenger, C. 2015. *Better use and management of levees: reducing flood risk in a changing climate*. *Environmental Reviews*, Vol. 23(2), pp.240-255. doi: 10.1139/er-2014-0060

This article focuses on a maladaptive approach in an international context, drawing on comparative public policy. Levees are established as being maladaptive using 'adaptive' and 'maladaptive' characteristics identified by adaptation theorists. It looks at the factors that make maladaptive approaches attractive in Australia and how countries overseas (in particular the NL) have managed to move towards a more adaptive approach. In particular it looks at decision making mechanisms and options analysis.

Wenger, C. (in press). *Building walls around flood problems: the place of levees in Australian flood management*. *Australian Journal of Water Resources*. [publication anticipated June 2015]

This paper takes a more detailed look at the use of levees in Australia. It reviews academic and practitioner literature and management studies to better understand levee use and management in Australia, including recent policy directions, provisions for levee information, reliability and safety, evidence of environmental impacts, and whether there is any evidence for levees impeding adaptation or increasing the consequences of flooding. The article reviews over 200 legislative, regulatory, guideline, policy and funding program documents

that relate to levees or levee-like structures in three states (QLD, NSW and VIC). It also looks at aspects such as catchment management, cumulative impacts and funding provisions for levees.