FLOOD

A STATEMENT ON RESEARCH PRIORITIES FOR
NATURAL HAZARDS EMERGENCY MANAGEMENT IN AUSTRALIA

Flood causes significant life, agricultural and economic loss in Australia and is the most financially costly natural hazard in Australia. The topological and geographic nature of the Australian landscape means Australians experience a wide variety of flood and inundation including flash flooding, sudden and long-onset riverine floods, coastal inundation and seasonal flooding in Northern Australia. In all cases floods can result in hazardous conditions that create a risk where interaction with the community takes place.

Australian Emergency Management Handbook 7 - Managing the floodplain: A guide to best practice in flood risk management in Australia (now part of the AIDR Handbook Collection) outlines the importance of preventing, preparing for, responding to and recovering from floods. However, the management of flood risks can be significantly improved.

Throughout 2015-2017, emergency service agencies around Australia participated in workshops hosted by the Bushfire and Natural Hazards CRC to consider the major issues in natural hazards emergency management.

This publication on floods summarises the outcomes of one of these workshops and poses questions as a guide for a national research agenda in natural hazard emergency management.

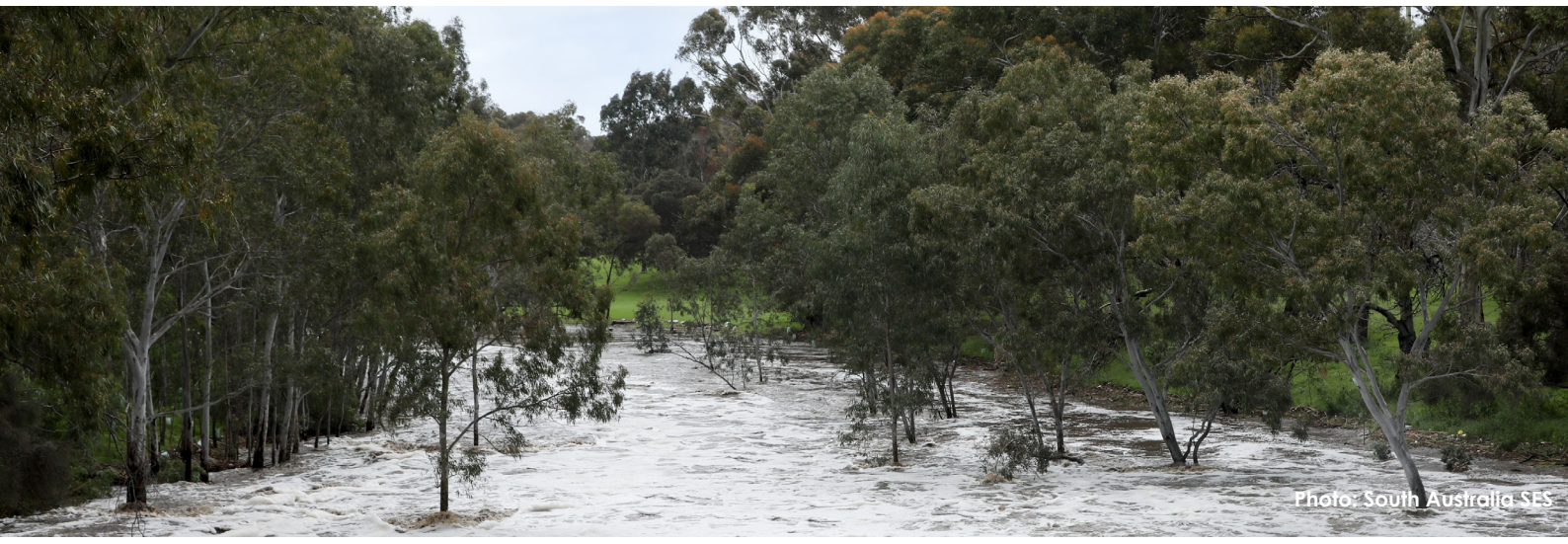

Photo: South Australia SES

COMMUNITY ENGAGEMENT AND RESPONSE TO WARNINGS

Engaging with communities is the primary tool agencies and governments use to help build resilience to manage their flood risk. Providing an understanding of flood risk ownership to communities is the critical component that should kick start community activity for preparedness for flood and help them to understand and respond appropriately to warnings.

The emergency management sector acknowledges the importance of risk ownership and the need to engage community as the primary risk owners prior to a flood emergency. There are certain community behaviours, simple and sophisticated, that can be adopted that will significantly reduce the risks and consequences of a flood in communities, including preparing individual homes, responding appropriately to flood warnings, and not driving through flood waters.

Flood preparation in communities can vary widely from an informed and prepared position to a completely uninformed position. Unlike fire preparedness, though, flood preparedness does not necessarily change significantly after an education campaign. Hence flood emergency agencies and government must work harder to engage communities to encourage preparedness.

- **How can the emergency management sector improve community capacity to prepare for, respond to and recover from flood?**
- **How can the emergency management sector reduce risk-taking behaviour during floods, such as driving through flood waters?**
- **How can the emergency management sector build effective relationships with community?**
- **How can the emergency management sector build effective partnerships with each other and the community across prevention, preparedness, response and recovery?**

BETTER LAND USE PLANNING

Land use planning has been identified by government, community and industry as crucial to community resilience and preparedness for natural disasters, floods in particular. Land use planning that actively uses flood management plans to manage the flood risk will reduce that risk significantly. However, disaster management and mitigation is just one element of a number of political, socio-economic and historical factors that drive land use planning in local government areas.

Some local and state governments and emergency agencies are attempting to be more inclusive in the land use planning process to enable greater understanding of risk and shared risk across communities. Because land use planning decisions are commonly political decisions, it is important that politicians champion that land use planning takes local flood risk into account when important decisions are being made.

Other improvements to land use planning involve improvement in the process itself. For instance flood management maps typically mark locations affected by a one-in-one-hundred flood, and plans are developed around such floods with no plans for floods that may be a one-in-five-hundred, such as the flood in Grantham in 2011. Government, emergency services and the community implicitly take responsibility for the residual risk, often with limited knowledge of this risk.

- **How can political processes account for flood risk in land use planning?**
  - **What mechanisms are available to ensure flood risk is properly accounted for in land use planning?**
  - **Given the vast legacy real estate holdings, what mitigation actions can be taken retrospectively, at residential and community level, to lower flood risk?**
  - **How can we improve advice on how to effectively respond and rebuild after a flood?**
- **What technologies, including flood modelling, exist that will help the process of land use planning in communities?**
  - **What skill will these technologies require to implement response to their modelling?**

BUILDING A TOTAL FLOOD WARNING SYSTEM

Every country and or jurisdiction aspires to a total flood warning system that neatly communicates to communities the threat of an impending flood risk in their area. However, building an effective end-to-end system is complex and requires the seamless integration of a range of components and processes including flood data collection, prediction, interpretation, message/warning construction, communication and review. All these components require input from a range of hydrologists, hydrogeologists, meteorologists, IT specialists, field technicians, modellers, evaluators and social scientists. The system is then further complicated as each of these scientists or technicians has their own perspective and are working to their own ends. Hence, a total flood warning system requires intensive financial, time and skill investment from government and the emergency management sector.

- **What scientific components are integral for an end-to-end flood warning system, and how should the physical aspects of floods be translated into effective warnings and communication to the public?**
- **How can the government bring together a range of disparate components and harness experts in these areas to develop an effective total flood warning system?**

CLIMATE CHANGE AND FLOOD RISK

Climate scientists agree that the world is currently experiencing climate change and there are a number of potential flow-on effects on flooding in Australia. There are a range of impacts potentially associated with flood stemming from climate change, most notably, variation in intensity, frequency and duration of rainfall causing significant run-off where it might not have been previously, or at levels not previously seen. These events can cause risk to life and may have socio-economic implications on infrastructure, buildings and land use planning.

- **What effects will climate change have on flood in Australia?**
- **How will climate change effect the flood risk levels in Australia?**
- **What is the impact of climate change on flood behaviour and management?**

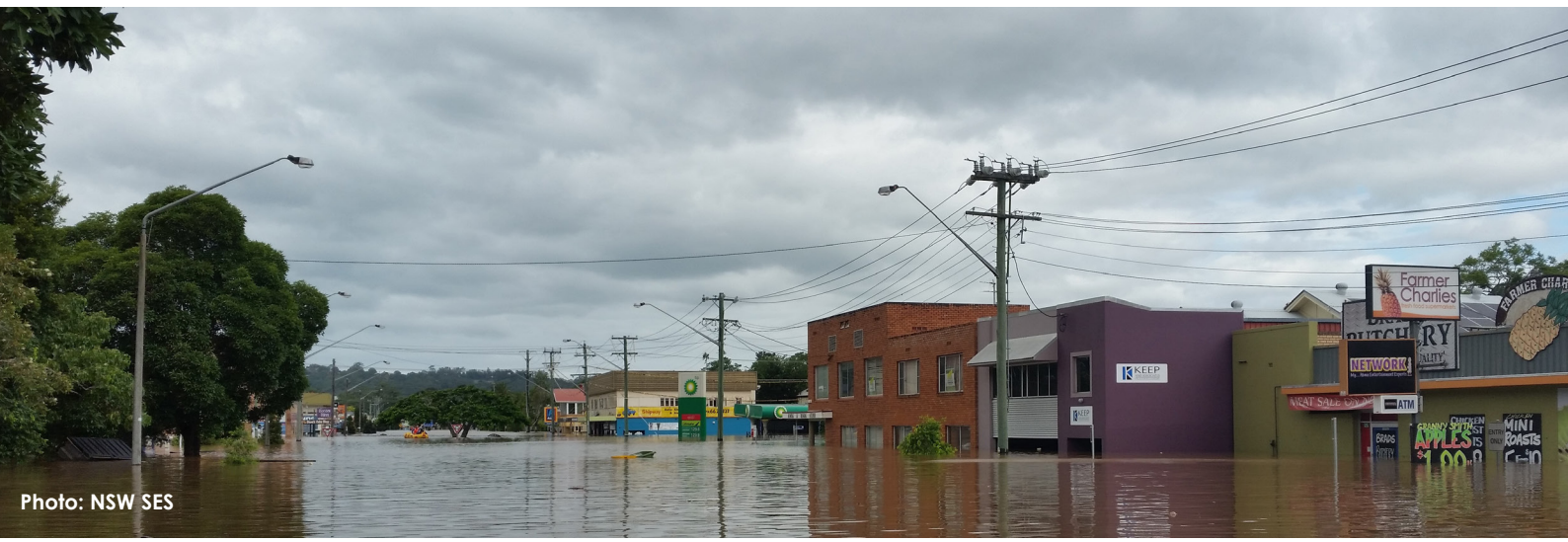

Photo: NSW SES

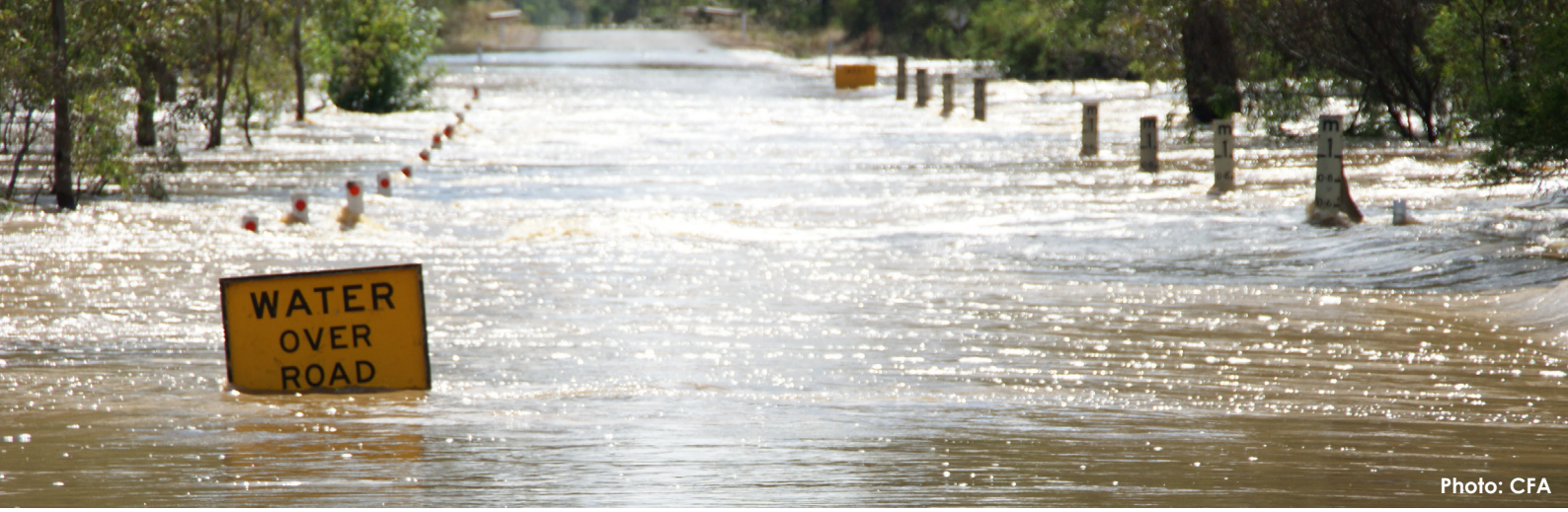

Photo: CFA

National research priorities for natural hazards emergency management

What are the most significant natural hazard emergency management issues Australia faces over the next 10 years?

This was the question posed to emergency service agencies around Australia in a series of workshops hosted by the Bushfire and Natural Hazards CRC from 2015-2017.

This publication is an outcome of one of these workshops and part of a broader national research agenda in natural hazards emergency management being developed by the CRC.

The workshops provided an exploration of major issues that would benefit from the support of research at a national level. There was no attempt to solve any of the issues or problems raised nor was there any discussion on the details of specific research projects. The participants discussed the issues they believed were relevant to the specific topic under discussion, the relative importance of the issues and the reasons underpinning their relative importance.

This series of publications summarises the outcomes of the workshops conducted so far – more will take place in 2017. They provide a guide for future research activities by identifying national priorities across major themes. The workshop outcomes have also influenced the evolving research agenda of the CRC.

This statement has been developed with the assistance of the National Flood Risk Assessment Group. The Group hosted a workshop with key flood management stakeholders from the Floodplain Management Conference in Nowra on 18 May 2016.

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