

FLOOD RISK IN AUSTRALIA: WHOSE RESPONSIBILITY IS IT, ANYWAY?

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Introduction

Flood risk management in Australia involves multiple stakeholders, including all three levels of government, State Emergency Service (SES) and other emergency response agencies, the insurance industry, catchment management authorities, and the local community itself. To best manage risk all these stakeholders need to cooperate and understand each other's role. The floods of the 2010-2011 Summer highlighted the extent of the flood hazard across Australia (BoM 2011), and raised the questions of how to better address flood risk. Since the Black Saturday bushfires of 2009, discussions on hazard management have emphasised shared responsibility. But how does this work in practice for the hazard of flood?

This paper investigates two questions: whether the perceptions of key stakeholders about responsibilities for flood management align or differ; and what thoughts are about national standards for flood management and information. This paper examines three key stakeholders: local council, the SES, and the insurance industry. It describes how these three stakeholders view their respective roles, highlights commonalities and gaps, and proposes a more integrated and uniform approach to addressing flood risk.

Effective flood management requires balancing of a range of needs, both long- and short-term and general and localised, what Raymond Burby describes as needing to be "both visionary and pragmatic" (Burby 2000, pg 105). A second important element of effective management of flood and other hazards is communication. Nicholls (2012 pg 47) lists three elements of effective communication: pre-event general communication for preparation and mitigation, in-event crisis response, and recovery discussion. In both of these cases, there needs to be clear communication on how these various needs are balanced.

Internationally, there are a number of examples of coordinated approaches to flood management. The United States' National Flood Insurance Program (NFIP) creates uniform flood maps for the country and requires planning standards for participation (FEMA 2011). In Europe, the European Parliament passed a directive for the member states on flood management, which provides detailed requirements for all countries on flood risk assessment, information availability, and coordination with other intra- and international stakeholders (European Commission 2007). In both cases, the roles of stakeholders are clearly delineated.

Background

Flood management in Australia has evolved over time. Table 1 presents a brief chronology of major events and decisions that affected flood management in Australia. One of the earliest discussions about flood risk in Australia was following a flood at Windsor west of Sydney in 1817, after which residents were criticised by then-governor Lachlan Macquarie for choosing to live in known flood areas (in DEP 1984). Suggestions that there should be some form of insurance or similar provision for those affected by floods goes back as far as 1875 (Maitland Mercury 1875).

Year	Event	Legislation/reports/response
1817	Windsor flood	Edict criticising residents living in known flood areas
1840s	Brisbane floods	
1852	Gundagai flood	Relocation of town
1875	Maitland floods	Discussion of flood insurance
1916	Clermont flood	Relocation of town
1955	Maitland floods	Establishment of NSW State Emergency Service
1967	Hobart fires	Establishment of Tasmanian SES
1974	Brisbane flood; Cyclone Tracy	Disaster insurance discussions; building codes for wind resilience; establishment of Qld SES
1999	Wollongong storm	ASIC flood insurance report
2009	Black Saturday fires	Inquiry; 'shared responsibility'; National Strategy for Disaster Resilience (adopted 2011)
2010-2011	Widespread floods	Victorian and Queensland flood commissions; National Disaster Insurance Review
2013		Rejection of compulsory flood insurance

Table 1: Select events and resultant changes in disaster management in Australia

Until recent decades, many hazard management decisions were reactive, largely prompted by 'big events' (Emergency Management Australia 1999). Examples include the relocations of Gundagai and Clermont following major losses of life (Coates 1999), the 1955 Maitland floods and the formation of the New South Wales SES (NSW SES 2011) and Cyclone Tracy and updated building requirements in tropical areas (Mason and Haynes 2010). Preceding the SES were civil defence organisations, established during the Depression and World War 2 and concerned with responding to potential attacks. The NSW SES was the first agency dedicated to emergencies and natural hazards. It was followed by other states, such as Tasmania following the 1967 Hobart fires (Tas SES 2008) and the Queensland SES following the 1974 Brisbane flood (QLD SES 2009). The 1974 Brisbane flood also led to investigations into a possible national disaster insurance scheme, which was rejected in favour of leaving insurance to the private sector (Howard, 1979). Discussions of flood insurance were also prompted by the 1999 Wollongong storm (ASIC 2000), and the 2010-2011 floods, which led to the National Disaster Insurance Review (NDIR 2011). Most recently, Suncorp stopped offering cover in Emerald and Roma in Queensland due to high losses (ABC News 2012), but have recently resumed offering policies in Emerald (insurancenews.com.au 2013).

Methodology

While many stakeholders are involved in flood management and response, three were chosen as the focus for this study: local councils, the SES, and the insurance industry. Council and SES are most closely involved in 'on the ground' planning and response, and insurance has come in for criticism in the aftermath of the 2010-2011 floods over non-payment of claims and high premiums. Semi-structured interviews were conducted with the three stakeholders, with these interviews being digitally recorded. Interviewees were asked how they viewed flood risk in their area (or for their industry in the case of the insurance respondents), how important flood awareness and planning was for their organisation, how they viewed the other stakeholders' roles in regards to flood, what responsibility they felt residents had in preparing for flood, and their thoughts on having national standards or guidelines around planning, information, and response.

Case studies were chosen to represent a range of states, sizes, and flood histories. Four locations were selected: Benalla in Victoria, Dora Creek in New South Wales, and Brisbane and Emerald in Queensland. New South Wales, Queensland, and Victoria together are home to more than 90% of Australia's at-risk properties (Leigh 2006). Two locations, Brisbane and Benalla, are among the ten communities with the most properties at risk in the country (Leigh 2006). The two Queensland case studies were also part of a National Climate Change Adaptation Research Facility (NCCARF) funded project on the impacts of the 2010-2011 floods (Bird et al 2013). The four locations include a small peri-urban community in Dora Creek, two large rural communities in Benalla and Emerald, and a major city in Brisbane.

The four locations selected have experienced multiple floods in their history. Emerald has had two record floods recently, in both 2008 and 2010 (Bird et al 2013). As well as the January 2011 flood and the 1974 flood, Brisbane has experienced numerous floods, the largest three in the nineteenth century, in 1841, 1844, and 1893 (Bird et al 2013). Benalla was only slightly affected by the Victorian floods in 2010 and 2012, and last experienced severe flooding in 1993. Dora Creek was last flooded on the June long weekend in 2007, and has a flood history dating back to the 1920s (SES 2011).

Participants were contacted by phone or email to introduce the research and arrange an interview. A questionnaire was distributed to residents in the four case study locations, asking them about their awareness of flood risk, insurance status, and thoughts on flood risk reduction. This paper does not present the results of those surveys, but does provide brief comment on general thoughts on each of the stakeholders. The Queensland fieldwork was conducted in August and September 2011, approximately 7 months after their respective floods. The Dora Creek fieldwork was conducted in April 2012, and the Benalla fieldwork in May 2012. In all four locations fieldwork lasted for one week. Insurance industry interviews were conducted in October and November 2012.

The following results are presented by stakeholder, first council, then SES, then the insurance industry. First the stakeholder's perceptions of their own role is presented, including any differences within the group. This is followed by their

perception of the other stakeholders roles, what responsibilities they think residents have, and their opinion of national flood planning or information standards. The discussion section looks at common interests of the three groups, any notable differences, and suggestions for improved interactions between the stakeholders into the future.

Results

Council

Interviews were conducted with both Mayors and flood or sustainability officers in three of the case study locations. In Brisbane it was only possibly to arrange an interview with the local councillor. Both elected and technical council representatives were interviewed to see if there were differences in responses from the two groups. Overall, the elected officials were slightly more open to discussing all topics. This was most noticeable in discussing flood insurance, where all elected councillors were forthright in their opinions, whereas one sustainability officer declined to discuss it because he felt it was *“too political”*. Despite this one instance of not answering, all council participants were interested and willing to participate.

All four councils saw flood management as an important local issue, listing it as one of their top environmental or planning issues. They all recognised their locations were flood prone, and in three of four locations – Benalla, Emerald, and Dora Creek – described their towns as poorly located. One of the Dora Creek interviewees saying *“realistically it’s one of those examples we look back on and think that in hindsight you’d never have allowed development here”*, in Benalla one described the town as being *“in the wrong place”*. The one exception to this attitude was in Brisbane, where the councillor blamed poor management for the 2011 flood. She raised the Wivenhoe Dam and how it had been sold to the community as having been *“built to stop future floods [so that] Brisbane wouldn’t flood again”*. While she felt flood management had been done poorly before the 2011 flood, she also recognised the local flood risk.

In all four locations, many properties in flood zones were slab on ground construction. All council participants recognised this as increasing the proportion of properties at risk, but felt they were limited in their ability to prohibit construction. In Emerald, council spoke of one development which had been recently begun before being submerged by the 2008 flood. No flood mitigation changes were made following that flood, and most of the 50 houses flooded in 2010. In Dora Creek and Brisbane the concern was also with infill developments, where the ground level was raised to the planning level, but causing runoff to neighbouring properties. Councils talked of encouraging flood resilient materials and building Queenslander-style properties, but also felt they could not completely direct what builders and developers could do.

All council participants saw the SES as valuable in both awareness and response. They saw councils as important in community engagement to inform of risk and encourage people to be prepared for flood, as well as response

during and after flood events. In both Benalla and Dora Creek, council had worked with SES on community education, and pointed to these programs as increasing community awareness of risk.

The majority of council interviewees held generally positive views of insurers, and felt flood insurance had a role to play in personal flood management. The one exception was again in Brisbane, where the councillor felt insurers had been unclear in their policies and unfair in their decisions, saying *“the insurance companies are pricks – and you can quote me on that”*. This councillor was interviewed seven months after the Brisbane flood, and her opinion was heavily influenced by the experiences of local residents, who expressed similarly critical views of insurers. Other council respondents saw insurers as a valuable personal mitigation option, but did raise concerns about premiums being potentially prohibitive for some residents. They did, however, feel it was the responsibility of those who could afford insurance to be covered, with one council participant described it as “annoying” that some people choose not to get insurance and then receive government assistance.

Councils recognised that better flood mapping had led to premiums being able to more accurately reflect a property’s risk, but indicated that many residents were unclear on the reason for premium rises, one saying *“people think they’re getting charged more for the same, and they don’t understand that in a number of instances they’re actually getting cover for the first time”*. Councils felt insurers could do more to inform residents and communities of the reasons for premium increases, as well as more general information about how flood insurance works. In both Benalla and Dora Creek, council had seen an increase in enquiries about individuals’ flood risk, complaints about insurance premium increases, and requests to see flood maps: *“we’ve had a lot of enquiries from people, complaining about how their insurance policies have doubled, and tripled, and all of this”*.

All council participants felt residents needed to be well aware of their flood risk. There were some differences noticeable between the two recently flooded locations and the two without a recent flood. In Brisbane, many residents believed that they were protected by the Wivenhoe Dam and could not flood. In Emerald many residents had only prepared for a flood the same level as the 2008 flood, but the December 2010 flood was almost one metre higher (Bird et al 2013). As a result, many residents in both locations were not adequately prepared. While the two recently flooded locations had found many residents unprepared, Benalla and Dora Creek councils were confident about their residents’ flood awareness and preparedness. Yet residents in those two towns were critical of their councils, citing poor drainage as a cause of localised flooding and wanting further council works such as dredging to prevent floods. In all four locations residents listed more risk reduction activities for councils to do, rather than actions they could take themselves.

Councils were broadly supportive of some form of national standards for flood planning and information. Some raised concerns that any standards could be set too low, rather than encouraging more mitigation and rewarding excellence. They felt standards would be best if descriptive rather than prescriptive, and emphasised the need to adapt to local variation and specifics. For example, Dora Creek being a flash flood area was raised as a reason that its flood

preparations would be different to Brisbane. Councils were more supportive of national information standards and availability. Councils also felt national standards would provide impetus for less prepared councils – described by one interviewee as being “*slack as*” – to be more proactive in flood preparation.

SES

The State Emergency Service described their role as both event response and risk awareness, unlike the view held by some other stakeholders that they are simply a response agency. The main interaction between SES and council was in awareness-raising. In both Benalla and Dora Creek, the SES had worked with local council on community awareness and information campaigns. Benalla was also one of the pilot locations of the Floodsmart (now FloodSafe) program in 2006 aimed at improving flood awareness through education of the local community and identifying high risk zones (VICSES 2008). Brigade involvement with council was largely on information campaigns and events, and not on discussions of planning. The SES unit responsible for Dora Creek said that, while they have been involved in local information campaigns, it is more commonly “*higher up than us that are liaising with the council, not so much our level, we don't see it much.*”

In both Benalla and Dora Creek, SES felt information and education programs had increased local awareness and preparedness. For Dora Creek they mentioned requests to speak at community meetings, saying residents had become “*much more aware and want to know about it more so than before.*” The Benalla SES pointed specifically to the floods earlier in 2012, when, of 265 rescues of motorists who drove through floodwaters, no rescues were performed in the Benalla region as evidence that their education campaigns were effective. They also referenced meter box stickers, distributed throughout town for the Floodsmart campaign, as a permanent indicator of flood risk at a particular property (VICSES 2008).

The local SES unit for Dora Creek is not based in the town but in nearby Cooranbong. This was raised as a concern for the SES, as it limits how much they can do for events in Dora Creek. The SES felt it would be useful for Dora Creek to have its own vehicles and personnel stationed before any flood occurs, saying it “*kind of needs a vehicle dedicated there and a group there to cater to it when the problem starts. But we don't have enough vehicles.*” For Brisbane, the size of the city was raised as constraining the SES' ability to respond to all requests. The ability of the SES to respond can be limited by the size of a disaster, the size of the region affected, and the number of requests for assistance made.

The SES had less specific knowledge on flood insurance, but felt it is important. They saw it as part of a residents' responsibility to be prepared, as well as something that “*takes a bit of the stress off*”. Unlike council, SES had not had enquiries from the public about insurance, and local units were not involved in insurance discussions.

SES emphasised the personal responsibility of residents to be informed and prepared for flood. SES stressed their role in educating the community so that people are prepared, particularly important in a location like Dora Creek, prone to flash floods with a short lead time. As time and resources limit the capacity of the SES, one said residents have *“all the responsibility”* to be prepared. Another commented *“all that we can do is help them as far as getting out and warning them. They’ve got to be ready for whatever’s going to happen.”*

Residents largely saw the SES as a response agency, rather than a preparedness agency. When asked what SES could do to reduce flood risk, many residents either listed council responsibilities such as planning laws, or response activities such as sandbagging. In Brisbane, some residents were critical of what they saw as a lack of SES presence during the flood, but views of the SES as an agency were generally positive in the other three locations.

The variability in local flood characteristics was raised as a potential difficulty for any national standards in flood management. That floods do not normally adhere to the design flood but *“sure as eggs it unfolds slightly different”* was given as a reason why support for national standards may be difficult to obtain, but there was support for national guidelines, particularly around information. As community awareness and preparedness were seen as crucial, uniform flood and mapping vocabulary across the country would make it easier for residents to transfer their knowledge to new locations.

Insurance Industry

Interviews were conducted with the Insurance Council, one reinsurer, and one insurance company. This small selection is not indicative of the entire insurance industry, but does provide more than one perspective from the industry. With earthquakes in New Zealand, the earthquake and tsunami in Japan, and floods in the USA amongst other disasters in addition to Australia’s floods, 2011 was the most costly year on record for natural disasters (Munich Re 2012). As a result, premiums are increasing to more accurately reflect the cost of high risk locations. One participant described the industry’s position as *“the canary in the coal mine”* signalling the cost of disasters through pricing.

All three interviewees saw insurance as financially quantifying risk, and rejected the perception that insurance is designed to spread risk. While insurers do not have direct involvement in local planning decisions, they felt their quantification and costing information should be taken into consideration by all levels of government as indicators of what areas may be uneconomic to develop. They described participation in discussions *“more generally”* with state and federal governments, and listed attendance at local community meetings, conducting post-flood visits and assessments, and funding of flood studies as specific examples of involvement in local flood management.

Insurers only had limited contact with local councils. They felt councils did not always use their planning powers to adequately control development. Commenting on Emerald, one said the town *“is a flood valley, but you can at least take into account what would be worst and what would be best in*

developments for that area". Also thought there was too much concern about future risks from climate change and sea level rise, "*a failure to deal with today, and a fascination with let's look at what we do in the future*".

There were differences between the three participants on how far insurance's role extends on flood planning and whether government has any role to play in insurance. The Insurance Council was not supportive of any government scheme or subsidies, saying "*we're not North Korea*" and government should not control the price or distribution of insurance. In contrast the reinsurer felt some form of government involvement would be necessary to properly address risk, and to "*grandfather in the grandfathers*", and assist long-term residents who had been legitimately unaware of the flood risk when they moved to their location. One suggestion was what he described as "*lifetime squatter rights*", where current residents would be subsidised, but future residents would not. The insurer was "*concerned*" about people dropping cover as premiums rise, but non-committal about any role for government. The federal government recently rejected the suggestion of the National Disaster Insurance Review to either make flood insurance compulsory or subsidise premiums in the highest risk areas (Australian Government 2013).

Despite differences on whether government should be involved in flood insurance, all three participants were in favour of national information standards and freely available information. Increased funding for mitigation was desired by insurance participants. This was seen as the area where government could be involved, and investment in mitigation was welcomed. However, the short-term nature of mitigation funding was criticised, one respondent saying

"last year they handed out \$800 million in grants, recovery grants to the local communities across Australia. So contrast \$800 million to \$20 million, \$800 million in post-event recovery to \$20 million in pre-event mitigation, and we've got it completely wrong as a community".

A second change insurers supported was a requirement for properties to be constructed for resilience as well as life safety, described as "*durability of property*". This was seen as one way to assist in reducing the cost of floods.

Insurers viewed the role of SES as largely in the disaster response sphere, and not planning and management. One commented that expanding the role of SES into broader management issues would 'dilute' their mandate. One suggestion was made for the SES to have a limited approval or advice role for a limited number of developments in a way similar to the NSW Rural Fire Service has in high-risk fire locations (NSW Rural Fire Service 2006). The importance of the SES' post-disaster role was noted by all three insurance participants, but they felt the SES focus was on response rather than prevention.

Insurers emphasised the need for individual and community awareness of flood risk. They saw insurance – and specifically increasing premiums – as a tool to increase awareness, saying "*hip pocket pain or pleasure is still one of the strongest motivators*". They worried if the price of insurance doesn't reflect the cost accurately "*it'd almost be like what would happen if you gave away 25 cents a litre petrol. You'd have a whole bunch of people driving Hummers and you wouldn't really care.*" As with the council and SES participants, they felt consumers should "*be aware and has to have some responsibility for learning*" so they are informed before an event.

Discussion

On a superficial level, there was almost uniformity in general responses about what is important for flood risk management. All three groups held similar views about the importance of flood management as a concept, the importance of each stakeholder, the need for residents to be proactively aware of their flood risk, and the value of national flood information standards. Each shared concerns about coordination with other stakeholders and complacency of residents – after long droughts, after ‘fizzers’ that were less severe than predicted. The one area of disagreement was in the role of government in insurance, with council and SES feeling government involvement was either necessary or inevitable, but only one insurer agreeing.

A major complaint from residents in Brisbane about both council and the SES was their invisibility during and after the flood. Concerns about the provision of flood warnings and assistance has been criticised by residents following disasters on a regular basis (Gissing et al 2010). Increased demand for SES assistance is already evident, with a recent study noting an almost 200% increase in demand in the space of one decade for the Victorian SES alone (Gissing et al 2010). Any attempt to increase the involvement of SES in flood management will need to address the current concerns of too few volunteers and too few resources. Gissing et al (2010) go on to stress the need for community engagement and preparedness.

Mismatched expectations were noticeable in comparing the stakeholder’s comments to local residents. Similar gaps between other stakeholder’s expectations and a group’s self-perceptions were found in a study by Green et al (1991) of researchers, engineers, emergency planners, and residents. There was a disconnection between how council and SES felt their flood risk management was perceived by the local community and the comments made by residents. Residents were also more concerned with what council and SES could do for them, rather than being proactive with their own preparations. The common comment from all three groups that residents need to have made their own preparations and be ready to act themselves is important in combating any complacency or inertia from residents. Similarly, while the insurers felt their role was a step back from local flood discussions, both council and SES felt insurers should do more to educate individuals and communities, a critique previously made by ASIC (ASIC 2000).

The National Strategy for Disaster Resilience (NSDR), adopted by the Council of Australian Governments (COAG) in 2011, discusses the need for ‘shared responsibility’ in addressing risks (NSDR 2009). It recognises that addressing hazards requires the involvement of governments, emergency services, local communities, and insurers. Emergency Management Australia’s guidelines also discuss prepared communities and active citizens (Emergency Management Australia 2004). The inquiries and reports following the 2010-2011 floods, however, have largely restricted their comments on residents to recommendations that flood information and warnings are understandable and easily accessible. These are important points, but residents have further responsibilities for personal preparation. A focus only on what governments,

emergency services, or insurers do may inadvertently instil passivity in residents, who expect all flood preparation and response to be undertaken by other parties.

While the recent experiences of the Queensland case studies are different to the two southern case studies with no recent severe flood, there was similarity in the responses on the broad needs of flood risk management. Much of the criticism in Brisbane was due to a feeling that the local community was not kept informed or involved in flood response efforts. The local councillor highlighted the need for interaction and communication between the bureaucratic level and those on the ground in future events.

An early 1980s review of disaster response in Australia found a focus on crisis-response over pre-event planning and mitigation (Britton 1984). Table 1 showed how hazard management decisions have followed major events. Insurers in particular were also critical of too little focus and funding for mitigation, compared to disaster response. Britton recommends a task-oriented, rather than hierarchical power approach (pg 127). Where the current arrangement is framed by how powers are divided between the three levels of government, starting from the tasks required and moving out to who completes those tasks shifts the approach from stakeholder-focused to task-focused. Beginning instead with the jobs to be done and assessing how each stakeholder can be involved in completing those tasks, would aim to bypass some of the current structural stalls.

One review following the 2010-2011 floods acknowledged improvement in collaboration and coordination between various stakeholders, but noted the need for further improvement (Richards 2011). The move from generalities to specifics appears to be particularly difficult, with much reference to resilience and 'aware and prepared' communities, with little indication of how to get there. The NSDR defines a resilient community as one that "works together to understand and manage the risks that it confronts" (NSDR 2011, pg iv), emphasising all stakeholders working together, but gives little guidance on how this is achieved or looks in reality. For local and national resilience to disasters to improve, clear steps for how to work together as stakeholders is needed.

Conclusion

Responsibility for flood risk management does not fall to any one stakeholder but is the responsibility of multiple agencies and local communities themselves. As the responsibility is shared, there needs to be clear understanding between each stakeholder of their respective roles, and that they communicate and cooperate on flood risk. This paper found that, while there is surface agreement between the stakeholder groups about flood management, there are differences in expectations of what each group's role is. This is most notable in expectations for residents to be proactive, versus their common expectation for flood management to be 'someone else's job'; and in how insurers should interact and communicate, again particularly with individual residents. To begin to address these gaps, this paper recommends a national approach to flood risk

management and particularly centralised flood information, and active engagement with residents to encourage proactive ownership of individual risk. This requires better engagement so that self-perceptions of stakeholders match the expectations of other stakeholders, and an effort to encourage residents' involvement in personal flood preparedness.

References

- ABC News, 2012. 'Suncorp won't offer new policies in flood-prone towns', 8 May 2012, available at: <http://www.abc.net.au/news/2012-05-07/suncorp-wont-offer-new-policies-for-flood-prone-towns/3994612> accessed 4 April 2013
- Attorney General's Department, 2009, *National Strategy for Disaster Resilience: Building our nation's resilience to disasters*, Australian Government, Canberra
- Australian Government, March 2013. *Australian Government response to the Productivity Commission report: Barriers to Effective Climate Change Adaptation*, Canberra
- Australian Securities and Investments Commission, 2000, *Consumer understanding of flood insurance, Report 7, June 2000*, Australian Securities and Investments Commission, Melbourne
- Bird, D, King, D, Haynes, K, Box, P, Okada, T, Nairn, K 2013, *Impact of the 2010/11 floods and the factors that inhibit and enable household adaptation strategies: A Report for the National Climate Change Adaptation Research Facility Synthesis and Integrative Research Program*, National Climate Change Adaptation Research Facility, Gold Coast
- Britton, NR 1984, 'Australia's organized response to natural disaster: Background and theoretical analysis', *Disasters*, Vol 8, Iss 2, pp 124-137
- Burby, RJ, Deyle, RE, Godschalk, DR and Olshansky, RB 2000, 'Creating Hazard Resilient Communities through Land-Use Planning', *Natural Hazards Review*, May 2000, pp 99-106
- Bureau of Meteorology, 2011, *Special Climate Statement 24: Frequent heavy rain events in late 2010/early 2011 lead to widespread flooding across eastern Australia*, National Climate Centre, Docklands.
- Coates, L, 1999, 'Flood fatalities in Australia, 1788-1996', *Australian Geographer*, Vol. 30, No. 3, pp 391-408
- Emergency Management Australia, 1999, *Australian Emergency Manual Series – Manual 19, Managing the Floodplain*, Commonwealth of Australia, Canberra
- Emergency Management Australia, 2004, *Australian Emergency Manual Series – Manual 1, Emergency Management in Australia: Concepts and Principles*, Commonwealth of Australia, Dickson, Australian Capital Territory

Department of Environment and Planning, 1984, 'Government and General Orders, Government House, Sydney, Wednesday 5th March, 1817' in *Review of Flood Prone Land Policy*, New South Wales Government, Sydney

European Commission, 2007, 'Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks', *Official Journal of the European Union*, L 288/27-288/34

Federal Emergency Management Agency, 2011, *National Flood Insurance Program: Answers to Questions About NFIP FEMA F-084 / March 2011*, Department of Homeland Security, Washington D.C.

Gissing, A, Keys, C, and Opper, S, 2010, 'Towards resilience against flood risks', *Australian Journal of Emergency Management*, Vol 25, No. 2, April 2010, pp39-45

Green. CH, Tunstall, SM and Fordham, MH, 1991, 'The Risks from Flooding: Which Risks and Whose Perception?', *Disasters*, Vol 15, No. 3, pp 227-236

Howard, J, 1979, *Natural Disaster Insurance: A Policy Information Paper by the Treasurer, the Hon. John Howard, M.P.* Australian Government Publishing Service, Canberra

insuranceNEWS.com.au, 2013, *Suncorp returns to Emerald*, 4 February 2013, available at: <http://www.insurancenews.com.au/local/suncorp-returns-to-emerald> accessed 4 April 2013

Leigh, R, 2006, *An estimate of the number of residential properties in Australia liable to inundation by an ARI 100-year flood: Report Prepared for the Insurance Council of Australia, July 2005 (Revised March 2006)*, Risk Frontiers, Macquarie University.

Maitland Mercury and Hunter River General Advertiser, 1875, *Another hint for a flood insurance fund*, Maitland

Mason, M, and Haynes, K, 2010, *Case Study: Cyclone Tracy, Final Report*, Risk Frontiers, Sydney

Munich RE, 2012, *Review of natural catastrophes in 2011: Earthquakes result in record loss year*, press release, available at http://www.munichre.com/en/media_relations/press_releases/2012/2012_01_04_press_release_en.pdf, 4 January 2012, accessed 22 January 2013

New South Wales Rural Fire Service, 2006, *Planning for Bushfire Protection*, Rural Fire Service, Sydney

New South Wales State Emergency Service, 2011, *The SES Story*, available at <http://www.ses.nsw.gov.au/about/ses-story> accessed 21 January 2013

Nicholls, S, 2012, 'The resilient community and communication practice', *The Australian Journal of Emergency Management*, Vol. 27, No. 1, pp 46-51

Queensland State Emergency Service, 2009, *History of the SES in Queensland*, available at <http://www.emergency.qld.gov.au/ses/history.asp>, accessed 21 January 2013

Richards, S, 2011, *Flood Risk: A paper examining the importance of building community resilience*. Pitney Bowes Business Insight, November 2011 (White Paper: Flood Risk)

State Emergency Service, 2011, *FloodSafe Dora Creek: Better FloodSafe than Sorry*, Lake Macquarie

Tasmanian State Emergency Service, 2008, *History of the SES*, available at http://www.ses.tas.gov.au/what_is_ses/history/, accessed 21 January 2013

Victorian State Emergency Service, 2008, *Benalla Community FloodSmart. Final Report January 2008*, Victoria State Emergency Service, Melbourne