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Addressing challenges for future strategic-level emergency management: reframing, networking, and capacity-building

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The mounting frequency and intensity of natural hazards, alongside growing interdependencies between social-technical and ecological systems, are placing increased pressure on emergency management. This is particularly true at the strategic level of emergency management, which involves planning for and managing non-routine, high-consequence events. Drawing on the literature, a survey, and interviews and workshops with Australia's senior emergency managers, this paper presents an analysis of five core challenges that these pressures are creating for strategic-level emergency management. It argues that emphasising 'emergency management' as a primary adaptation strategy is a retrograde step that ignores the importance of addressing socio-political drivers of vulnerabilities. Three key suggestions are presented that could assist the country's strategic-level emergency management in tackling these challenges: (i) reframe emergency management as a component of disaster risk reduction rather than them being one and the same; (ii) adopt a network governance approach; and (iii) further develop the capacities of strategic-level emergency managers.

Keywords: Australia, climate change adaptation, network governance, strategic-level emergency management

Introduction

The mounting frequency and intensity of natural hazards, alongside growing interdependencies between social-technical and ecological systems, are establishing an increasingly complex set of challenges for emergency management (Murphy and Dunn, 2012). At the strategic level of emergency management, which involves planning for and managing non-routine, high-consequence events, these challenges are particularly acute and likely to become more critical in the future. The potential for major consequences means that there is significant political interest in this level of management, including great concern about the direct and indirect effects on longer-term economic and societal well-being, and intense community and media scrutiny.

The role of strategic emergency management in Australia can best be understood in terms of cross-agency coordination between the operational, tactical, and strategic

levels of emergency management (Paton and Owen, 2013). The operational level represents first responders activated at the onset of an incident. The tactical level involves local incident management teams working to support responders in containing and mitigating events and to share information aimed at helping communities make informed decisions. Strategic arrangements take place at the regional, state, or national level and serve to guide overall management of the process, including addressing whole-of-government and community concerns regarding the broader implications of the event and longer-term recovery. Consequently, people working at the strategic level assume important leadership roles in understanding, articulating, planning for, and managing emergencies. Increasingly, these people have to work in shifting environmental, socio-political, and technological contexts.

Drawing on a literature review, a survey, and both interviews and workshops with Australia's senior emergency managers, this analysis focuses on core challenges facing strategic emergency management in Australia, and identifying proposals for addressing them. While the challenges are necessarily presented sequentially, the most central issue facing the sector is their intertwining and interacting nature. Hence, actions to address these challenges need to be systemic and systematic.

After outlining the research methodology, the paper examines five core challenges facing future strategic-level emergency management in Australia. It then presents three key suggestions that could assist the country's strategic-level emergency management in addressing them: (i) reframe emergency management as a component of disaster risk reduction (DRR) (rather than them being treated as one and the same); (ii) adopt a network governance approach; and (iii) further develop the capacities of strategic-level emergency managers.

Methodology

The interviews, survey, workshops, and feedback provided participants with multiple ways of voicing, discussing, and reflecting on their perceptions of current and future challenges facing strategic-level emergency management. They were asked to especially consider challenges facing the emergency management industry's critical needs over the next 5–10 years.

The study participants were all senior leaders with considerable experience in emergency service organisations. The median number of years that they had been in the sector was 24, and the median number of years within their particular agency was 13. An initial round of interviews with 34 strategic-level emergency managers identified indicative themes among the core challenges. Two subsequent workshops validated those themes, which were synthesised into an industry report (Owen et al., 2013). This document was circulated to an additional 36 industry leaders via the Chief Executive Officer of the Australasian Fire and Emergency Service Authorities Council who invited them to nominate at least two members of personnel who they considered to be well-placed to discuss the topic. Another 19 senior members of the

broader emergency management community with experience in strategic-level emergency operations centres were also invited to take part in the survey. From a potential pool of 89, 38 responses were received, representing a return rate of 42 per cent. According to 91 per cent of survey respondents, the report represented the key challenges to strategic-level emergency management well or very well. In addition to commenting on the report's findings, participants were asked to provide suggestions for possible actions to tackle the identified challenges. The following section outlines the challenges pinpointed through this process, including some of the fundamental drivers, and possible approaches to remedying them.

Core challenges

The study identified five core challenges confronting Australia's strategic-level emergency management:

- Increasingly complex context (environmental, social, and technological change).
- Tensions between political drivers and operational realities.
- The role of emergency management in community resilience.
- Measures of effectiveness.
- Information systems and social media.

The following subsections describe these five challenges and examine their drivers. Three proposals are then set out that could assist the country's strategic-level emergency management in addressing these challenges.

Increasingly complex context (environmental, social, and technological change)

Participants described one of the most substantial challenges they face as the increasing number and complexity of significant emergency events, driven by dynamic interactions between environmental, political, social, and technical changes. They pointed to mounting evidence of increases in the frequency, duration, and magnitude of emergency events in Australia and New Zealand driven by a changing climate (Yates and Bergin, 2009; Bureau of Meteorology, Australian Government, 2010; Council of Australian Governments, 2011; Murphy and Dunn, 2012). The importance of climate change pertains in part to its role in producing 'changes in the frequency, intensity, spatial extent, duration, and timing of weather and climate extremes, and . . . unprecedented extremes' (Field et al., 2012, p. 111), as well as in boosting the prospects of simultaneous events. One participant (14)[1] noted that:

> These mega fires that people talk about—huge fires that are infrequent but catastrophic and incredibly expensive to deal with . . . We're going to get more of those with climate change and with fewer people to deal with them. So, your firefighting is either going to become more

expensive cause you'll be aerial firefighting or you're just going to have to be prepared to accept much greater damage bills.

Participants also discussed how changes occurring within economic, environmental, and social systems are interacting with a changing climate. Climate change was considered important because it will compound factors already contributing to social-ecological vulnerabilities to natural hazards (Bosomworth and Handmer, 2008). For instance, only six per cent of the Australian landmass is arable, and land clearing, water extraction, and poor soil conservation are degrading the quality of this limited resource (Australian Government, 2014). By exacerbating the impact of soil degradation, climate change has the capacity to heighten the vulnerabilities of communities, agriculture, and natural resource management, which depend in part on quality soils.

Participants also highlighted the increasing urbanisation of both coastal areas and hinterlands as augmenting pressures on human and natural systems. For example, since the mid-1970s, Australia has witnessed the movement of retirees, 'alternative lifestylers', and those who are able to conduct their business through the internet (often termed 'tree-changers' or 'sea-changers') from metropolitan cities to non-metropolitan parts of the country (Murphy 2002; Burnley and Murphy, 2004). Participants contended that these 'tree- and sea-changers' were accustomed to extensive government and agency support during events in urban areas, and that they expect the same level of service delivery in rural areas to which they move. One (15) posited that this situation potentially increases the vulnerabilities of such groups to hazard events:

I perceive rural people have got much better resilience. They know that there isn't an ambulance around the corner. They can't just ring 000 because I'm hot—but we get those calls in Melbourne. [Rural people] are prepared to look after themselves and an emergency is an emergency when I can't cope with it anymore. Whereas in Melbourne, it's quite different: an emergency is when I don't want to cope with it and I call somebody else. So I think the community expectations is a problem and it's leading to a lack of resilience particularly in the metropolitan areas, and also for people who move from the country to the city, at least that is my experience.

The country's strategic emergency managers are also concerned that the growing interdependence between infrastructural, social, and technical systems is boosting vulnerabilities to hazards. Interdependencies between energy, transport, and food production systems, for instance, mean that the disaster impacts experienced in one community can affect many other communities (Boin and 't Hart, 2010). Participants were particularly concerned that intensifying significant events increase the chances of a breakdown in a 'weak link' in interconnected critical infrastructure systems. This is because critical infrastructure is important in a modern society reliant on the effective functioning of utilities to provide public services, maintain a quality

of life, and encourage economic growth. Despite the sometimes fragile nature of essential critical infrastructure services during disaster events, industrialised societies expect that they will be available during extreme events (Boin and McConnell, 2007; Gheorghe et al., 2007; Marti and Hollman, 2008; Sarriegi et al., 2008; Beccuti et al., 2012).

Tensions between political drivers and operational realities

Another increasingly important challenge for strategic-level emergency management is political involvement during significant events. It is well-recognised that, in a time of crisis or emergency, political leaders are expected to be informed and demonstrate visible leadership (Boin and 't Hart, 2003; Boin, 't Hart, and McConnell, 2009). While acknowledging that government ministers have an important role to play during operational responses in providing authority and credibility and informing strategic decision-making, study participants noted that the relationship between the political and operational aspects of emergency management can be challenging. They suggested that, particularly during significant events, some political responses are ad hoc, inconsistent, and concerned with 'messages for the media' or achieving a political position. These tensions were seen to be due to a lack of shared understanding and agreed processes.

Participants proposed that their cohort should seek to understand the socio-political environment in which politicians operate, and underlined a need for secondments to ministerial offices as well as leadership development in diplomacy. They advocated establishing agreed arrangements, relationships, and understandings well before any major event, enabling a coordinated approach to fulfilling political and operational needs. One (30) stated that:

> Forums and roles need to be exercised to engender familiarity and to build and maintain the personal relationships and trust that is required to work effectively at these levels.

They were also of the collective view that the most effective political leaders sought briefings from agency staff and were careful not to raise community expectations beyond what emergency services could meet. Expectations and the roles and responsibilities of emergency services and political actors are intertwined with questions about how communities and politicians evaluate emergency management performance. This issue is expanded below.

The role of emergency management in community resilience

Two dominant phrases in emergency management parlance and policy documents represented another core challenge for strategic emergency management:

- shared responsibility; and
- disaster resilience.

While acknowledging that a broad notion of 'shared responsibility' could be important (McLennan and Handmer, 2012), senior managers in this study expressed disquiet about what it actually constitutes and whether there is a shared understanding of the concept. Their disquiet centred on whether the concept reflects more neo-liberal ideas of 'small government' (and therefore a reduction in community services) or of gaps between what can reasonably be expected from populations during extreme events and what they are willing or capable of doing. Many participants were concerned that communities often are left to manage residual risks shifted towards individuals whether or not they have the financial, physical, mental, or social capacity to manage them, such as managing natural hazard risks after susceptible lands have been approved for development (cf. Handmer, 2003).

Participants also suggested that, while 'disaster resilience' could serve as an overarching concept for integrated and proactive emergency management planning, there is a distinct lack of a shared understanding of what constitutes resilience, and, hence, what role strategic–level emergency management should and could play in its implementation. For instance, they noted that attempts to enhance community resilience are undermined by mixed and sometimes contradictory messages from different emergency service organisations and governments. One (22) said that:

> We tell people that they've got to be self-reliant in the case of flooding but here's [name of emergency service] with a couple of helicopters that are on permanent standby and so of course the minute there's a flood anywhere, they're filling them up with milk and bread and going around doing air drops to houses. So on the one hand you tell people to be self-reliant and on the other hand what you're actually demonstrating is there's generally no need to be self-reliant, we will come and fix things up for you and you also generate the capacity for resentment, aggravation and argument if a person happens to be one of the few who didn't have the helicopter arrive and drop the bread.

The capacity to address and support community resilience is linked to many of the other identified challenges, particularly the need to address socio–political drivers of vulnerabilities. Yet, the matter of the role (and capacity) of the emergency services in directly addressing them largely remains unexplored.

Participants were far from settled on the concept of disaster resilience and the role of strategic–level emergency management within the broader agenda of DRR. On the one hand, one group asserted that, owing to financial cutbacks, the sector should focus solely on emergency response. Another framed the role of emergency management as being about connecting response and recovery, including community engagement activities that support preparedness. A final group argued that, for strategic–level emergency management to fulfil its role in DRR, planning needs to incorporate a much wider and more integrated and longer–term view, necessitating active interaction with the political system. As one (30) participant put it:

> This means a seat at strategic decision-making forums and associated accountability for those decisions.

Measures of effectiveness

Related to the role of emergency management in community resilience is the challenge of addressing community (and therefore political) expectations or defining and measuring emergency management efficacy. Participants consistently described community expectations as increasingly unrealistic and argued that, as a consequence, community disaster resilience had declined. They argued that a central driver of this challenge is an expectation that emergency service organisations will provide a consistent level of service despite mounting evidence that presently unsustainable lifestyles are making people ever more vulnerable to a changing climate and associated extreme events. One (30) noted that:

> There is a general expectation among community members that it is the government's role to keep them safe and . . . any strategy to do so should not impinge on individual freedoms. Government and emergency management agencies have accepted, and at times actively encouraged, this belief to the point that many emergency management agencies perceive their primary role is to 'bring order out of chaos' under emergency management conditions. This leads to a re-enforcement of the response model at the expense of the risk mitigation model in agency, community, and political contexts.

In many jurisdictions, while monitoring and review strategies are being developed, there is concern that external sources (such as the media) evaluate the success or failure of emergency management in a post–hoc and arbitrary manner, and that this 'evaluation' is primarily dependent on whether or not there was a good outcome (Owen et al., 2012). Participants suggested that the ramifications of such capricious evaluations combined with potentially unrealistic community expectations include increasingly adversarial post–event inquiries. They added that it is dampening the interest of existing and potential senior managers in assuming critical decision-making roles, both because of perceived exposure to litigation and a desire not to be portrayed as having 'let the community down'.

Part of this challenge relates to establishing agreed outcome measures and difficulties in setting universal standards that can be applied across all scales of events given the subjective nature of performance assessments. In many other safety critical industries, sole reliance on outcome measures has been found to be flawed and even dangerous for the longer-term viability of the system (Dekker, 2006; Hollnagel, Woods, and Levensen, 2006). Equally, the outcome of an emergency might have been positive, despite unsafe practices and risks taken by all involved (including community members), and it was simply down to luck that there was not an adverse outcome (Dekker, 2006). Conversely, all the best measures and processes may have been in place and performed well, but in spite of harm being minimised, there may still have been negative impacts. As a couple of participants (4 and 22) pointed out:

> This is a fundamental question. Can they [significant events] be well managed? The minute we ask the question . . . then that immediately limits the conceptualisation of the

problem. The whole point of going down the resilience path was to rethink this idea not just another name change. Is it not about adapt and innovate in the face of very rapid change; very different to managing. You don't manage a Black Saturday.

This is a tricky one and one which is not palatable to the community . . . the Victorian fires [of 2009] in my view had a good management outcome. . . . [We] could have been looking at 5,000 deaths from that fire.

Participants were particularly concerned that there needed to be wider and more explicit support for risk reduction activities. This was the case even when such efforts may seem to inconvenience communities at the time of their implementation, such as tolerance of smoke from fuel reduction burning or acceptance of certain land use or development constraints or even exclusions.

Participants suggested that there needed to be a dialogue to address expectations regarding management of significant or unbounded events and, given economic and social constraints, acceptable levels of risk (Kapucu, 2008). They suggested that internal debriefs and reviews should continue to facilitate continuous improvement and learning, and that a national–level, multi-jurisdictional 'roundtable' develop, trial, and review fit-for-purpose performance criteria. They also emphasised that development of process and outcome measures appropriate to the industry could assist personnel and external stakeholders in better recognising challenges and accord personnel with some protection during post-hoc, adversarial inquiries. As a couple of participants (27 and 24) stated:

[We are not] of a mindset to ensure that the public knows just how difficult a task is undertaken at times.

These objectives (i.e. purpose for EM) and performance indicators would be based on a clear value proposition for the various stakeholders.

Several participants noted that such dialogue needs to extend beyond an appreciation of the complexities and limitations of managing responses to significant events and include political understanding of and commitment to risk reduction efforts.

Information systems and social media

Another broad challenge identified by the study's participants concerned the increasing sophistication and use of information systems and social media, both within the sector and communities. A range of data on the use of information systems during significant events reinforces the extent of the challenge. In a sophisticated technological age, the use of information systems during disasters is inevitable and necessary owing to the multitude of public and private organisations now involved in strategic-level emergency management, each with their own specific information requirements (Comfort et al., 2004; Turoff et al., 2004a, 2004b; Van de Walle and Turoff, 2008). Yet, financial constraints and a lack of uniformity in standardising disaster

management information systems often limits the ability to visualise and disseminate information (Baber et al., 2007; Militello et al., 2007; Ley et al., 2012). Compounding information system incompatibility are privacy and security constraints that complicate the sharing of information between organisations at a strategic level. The literature indicates a need to explore legislative change in addressing some of these challenges (Kruchten et al., 2008; Reddick, 2011; Vogt, Hertweck, and Hales, 2011).

Concern about, and interest in, the role of social media during significant emergency events was also expressed. While participants highlighted several ways in which social media could potentially support information dissemination, its effective contribution to emergency management was contested. Participants asserted that, although information is increasing in diversity and accessibility, its variable quality needs to be taken into account. In the words of three (14, 9, and 38) participants:

> *This is a major challenge for the fire and emergency management sector. This phenomenon cannot be stopped, nor can it be totally controlled. The major risk is around the reliability of information. Any individual can post information that may or may not be true, which others may then use to make life-changing decisions. However it also provides an opportunity. People will tend to place greater trust in 'official' sources, provided those sources are readily available and current. This places an obligation on fire and emergency organisations to embrace these emerging technologies and resource them accordingly.*

> *Cost of personnel being assigned to address social media trivia and hype instead of gathering and quality assuring our own intelligence.*

> *Get over it. Lose the fear of something which is not dominated by the hierarchy, appreciate its weaknesses and flaws, play to the space and earn a reputation as a trusted source.*

Participants emphasised that addressing this challenge necessitates the creation of wider connections and alliances with a new range of organisations and social media users to examine harnessing and harvesting social media from a variety of perspectives. They also noted that a first step would be to develop relationships with existing social media providers and experts, rather than attempt to build expertise in-house or to 'reinvent the wheel'. Finally, some said that there is a need to apply tools that can filter 'crowd-sourced' information to inform intelligence-gathering teams within emergency management, including mapping images uploaded on to social media websites to gain 'real-time' intelligence. To make best use of such technologies, the sector could start with a review of existing industry practices on the use of social media.

Addressing the challenges
(Re)frame emergency management as a component of DRR
Study participants contended that, to address these challenges, there is a need to explicitly frame the role of strategic emergency management *within* a broader DRR

context. As outlined earlier, strategic emergency management guides the overall handling of major events, including tackling of whole-of-government and community worries about consequences and longer-term recovery. DRR has a much wider agenda as it is concerned with addressing socio-political drivers of vulnerability to hazards (Pelling, 2003; Field et al., 2012). Participants highlighted that the efficacy of strategic-level emergency management is very much influenced by this broader DRR agenda. Moreover, the majority of Australia's strategic-level emergency managers fear that the industry's existing challenges will become increasingly difficult to resolve without greater efforts to address socio-political drivers of vulnerabilities. In short, there was concern that emergency management was equated with DRR, rather than being considered *one* component of that broader agenda. As one (4) participant put it:

> We're expected to arrive on the day of the disaster and somehow hold back the waters, stop the catastrophic mega fire and we can't do it. And then we get blamed because the town planning or the building infrastructure laws were not enforced and people build on the flood zone and the local council caved in to the developer and all of that. . . . This [need for change] will fall into place once the core problem is reconceptualised. It's meaningless until then. There is some very good stuff out there once [the need] to change has been accepted.

Recognising the challenges exacerbated by the increasing occurrence of 'non-routine and unbounded events' (Handmer and Dovers, 2007) and a changing socio-political/environmental landscape, most participants flagged the need to review and clarify the role of emergency service organisations. Such a perspective reflects the idea of reflexive learning in reframing policy problems (Schon and Rein, 1994; Bosomworth, 2015) to explore and understand better their multidimensional nature. One suggestion from this study is to facilitate a dialogue on the public value of emergency management, including a realistic portrayal of capacity and community expectations, as it operates within a broader setting.

These senior managers attached greatest weight to situating their work *within* community-based DRR efforts. Hence, there is a need to reposition clearly emergency management on the broader agenda of DRR as it relates to community resilience. Theoretically, DRR concentrates on the underlying drivers of vulnerability to hazards, with an overall focus on capacity-building and development (Wisner et al., 2004), as well as on reducing or avoiding pre-existing socio-political factors that turn an emergency event into a disaster.

Viewing Australia's strategic-level emergency management as a contributor to DRR that is greatly influenced by the efficacy of that broader agenda could provide a conceptual and practical framework via which it might better achieve its goals. Perhaps more importantly, explicitly contextualising emergency management within a broader societal agenda of DRR and its relationship with resilience and sustainability could help the sector to manage some of the identified challenges. Australia's *National Strategy for Disaster Resilience* (Council of Australian Governments, 2011) may

offer some political imprimatur for such an approach. However, efforts under its auspices will need to be accompanied by an emphasis on tackling the underlying socio-political drivers of vulnerability, which could do more to reduce the impacts of hazards, as opposed to turning increasingly to emergency management for the solution.

Leadership capacity-building

Demands associated with incident complexity, managing increasing expectations, and recognising certain limited capacities of the sector present new challenges for leadership and strategic planning, including a need to change the cultural institutions of the emergency services. First, there is a requirement for knowledge and skills among personnel in strategic-level emergency management teams, as well as for political representatives to be fully engaged in and have an understanding of the entirety of emergency management. Political decision-makers must be engaged before a crisis so that operational objectives and possibilities are well-understood in the 'heat of the moment'. In addition, strategic-level emergency managers need to become more directly involved in policy matters, particularly those connected to DRR, and not see themselves as somehow 'separate' from public policy processes.

A holistic view of the challenges identified here also points to a need to support the development of new skills among strategic-level emergency managers and members of their teams, especially in sharing, refuting, and calibrating distributed situational information to build 'collective meaning structures' (Kruke and Olsen, 2012). It also indicates a need to forge skills that enable recognition of when the quality of decision-making or performance may be in decline, so that individuals and teams can collectively avoid or recover from such situations. Similarly, study participants raised concerns about maintaining a workforce capability in an all-hazards environment, given that increasing incident complexity means significant events may involve a set of problems not previously experienced. A focus is needed on developing skills in 'managing the unknown', rather than in technical prowess.

These concerns reflect many arguments found in the literature. Murphy and Dunn (2012, p. 7), for instance, argue that, while training for routine accidents is effective at all levels of emergency management, this is not the case for novel or unbounded disasters. A lack of training and support for such events places undue stress on people who, on the whole, care deeply about the outcomes. A capability to provide what Marcus, Dorn, and Henderson (2005) term 'meta-leadership' is also an identified need across agencies. A number of participants observed that increased cross-agency training is required to facilitate sound working relationships and the necessary capabilities for all-hazard environments.

All of the challenges discussed in this study yield new objectives for leadership and capability development in the emergency services industry, including legislative support and technological innovation. Yet, the study found variability in current leadership development, with only some jurisdictions having created relevant programmes. Participants said that a shift towards further leadership development might

be facilitated by national-level strategic leadership and training. In addition, they stated that learning across the industry could be supported through a 'safe spaces' approach (Arao and Clemens, 2013) to critical reflection and review.

Brooks and Owen (2012) suggest two key strategies to help address these challenges. The first is to effectively link formal training pathways with assessment, exercise, and role performance, including the three stages of non-technical skills training: awareness-raising; practice; and continual reinforcement. The second is to review, assess, and possibly develop new 'rules-of-thumb' or 'quick strategies' for coordination at the strategic level of emergency management to aid handling of complex, dynamic, and uncertain environments. For instance, there is a need to train at what Renaud (2010) calls 'the edge of chaos', in order to be more effective when coordinating responses to unbounded events. This type of training, where the emphasis is on innovation, collaboration, and experimentation, could create an opportunity to move from a 'command-and-control' type of culture to one characterised by collaboration and influence.

Adopt a network governance approach

Participants were concerned that part of what undermines the ability of strategic-level emergency management to address these increasing complexities is a currently disconnected and fragmented policy landscape. For example, emergency service organisations frequently find themselves at the end of a decision-making chain dealing with the consequences of a rising number of hazards. It has become ever more common in parts of Australia to trade off the risks posed by natural hazards, such as locating developments in flood- or fire-prone areas, against an increased emergency management capacity (Handmer et al., 2012). In addition, each state has different jurisdictional and governance arrangements in place, challenging attempts to integrate emergency service arrangements (Eburn and Dovers, 2012).

Difficulties also stem from tensions between administrative areas of responsibility within governments, frequently resulting in silo mentalities within organisations and sometimes horizontal rivalries vis-à-vis responsibilities and resources (Howes et al., 2015). Alongside other organisational and institutional changes, such as local governments downsizing their core business, and outsourcing and relying on contractors for plant and operations, administrative tensions have implications for the tackling of complex emergency management issues.

To address this fragmented policy context, strategic-level emergency management needs to adopt a network governance approach, as advocated by Howes et al. (2015). Network governance—a necessity in contemporary disasters (Scholtens, 2008)—relies not only on the involvement of traditional organisations, such as ambulance, fire, and police services, but also on critical infrastructure, communities, and non-governmental organisations. Howes et al. (2015) stress that a network governance approach could help to address the additional challenge of maintaining currency of knowledge while operating in a context increasingly characterised by economic and financial constraints. For instance, ongoing workforce restructuring within the emergency services presents

real tests to future scanning and strategic planning, and tends to focus attention on matters on the immediate horizon.

However, as Howes et al. (2015) highlight, there are deeply structural and cultural barriers to a network (collaborative) governance approach that also hinder the capacity for new learning. Emergency services are traditionally hierarchical in nature with clear command–and–control arrangements. Yet in striving to collaborate with non–emergency stakeholders, there is a need to emphasise relationships and alliances: horizontal coordination mechanisms among peers rather than vertical control mechanisms among commanders and subordinates (Fulk and DeSanctis, 1999; Ostrom, 2010; Bharosa, Janssen, and Tan, 2011). Participants contended, therefore, that, if strategic-level emergency management is to adopt a network governance approach, the sector must first overcome these cultural barriers within the industry to encourage better alliances and relationships with a wider group of stakeholders.

These senior managers pointed out that the traditional reactive 'command–and–control' culture, reinforced by the need to manage and coordinate in a dynamic and sometimes chaotic and dangerous emergency environment, needs to be addressed across the entire sector. Dominant and collectively-held beliefs of emergency services often establish a basis for a stereotypical social identity (Lyng, 1990; Lois, 2001; Owen, 2013), such as that they should be able to manage any emergency, no matter the context. While much research suggests that the deeply ingrained bureaucratic cultures of the emergency services also can compel an allegiance to their own agency and foster a culture of rivalry (Marcus, Dorn, and Henderson, 2006; Waugh and Streib, 2006; Marincioni, 2007), such social identities and rivalries are not unique to the emergency services (Edmondson, 2005; Kimmel, 2008).

These 'ideological echo chambers' (Zuckerman, 2008) and cultural barriers can present barriers to reflection and learning from errors. This problem is exacerbated by the fact that the sector often is trapped in a perpetual cycle of response, internal review, prepare, and respond again (Owen, 2012). Equally, study participants noted that, while there is a need to change certain definitions of identity of many actors involved in emergency management response, there is also a need to change the expectations of community groups, the media, and political leaders (abandoning the perception that the services should be able to manage any emergency, no matter what the context).

The main implication of these institutional barriers for strategic-level emergency management is that, without a networked governance approach, the sector's capacity for high-level reflection and learning may be constrained. Networked governance could help strategic-level emergency management overcome a tendency to react within narrow frames of problem-solving, and to challenge the traditional occupational identity of reactive 'command and control'. People need to be able to think ahead, function in an inclusive manner, and draw on networks in collaborative ways, while at the same time engaging in timely decision-making. This takes the argument back to the need for a reframing of the role of emergency management within DRR *and* for strategic-level managers to demonstrate leadership in this regard.

Conclusion

To address the challenges facing future strategic-level emergency management in Australia holistically, there is a need to: (i) reframe emergency management as a component of DRR rather than emergency management and DRR being one and the same; (ii) adopt a network governance approach; and (iii) further develop the capacities of strategic-level emergency managers.

It is vital to consider the long term and to contextualise emergency management within the broader goals of DRR and sustainable development. This demands a framing of the complex policy problem of emergency management as an important component of the *broader* agenda of DRR. Initiating such a shift could involve discussions with the country's different jurisdictions to develop a nationally-agreed position on the role of emergency service organisations in DRR. This may encompass, for instance, redressing the balance of expertise among staff, the integration of personnel from different sectors into various planning, preparedness, and response activities (and vice versa), and defining the mandate of emergency service organisations so it is of manageable scope.

More clearly framing emergency management as a component of DRR would also assist in the sector's adoption of a network governance approach. The way in which a sector is framed is partly a reflection of its 'culture'. Participants argued that a culture of 'command and control' within the emergency service industry risks alienating the necessary wider group of stakeholders. Addressing that culture could facilitate the ability of strategic-level emergency management to more effectively cooperate with other groups that collaborate with communities on issues beyond emergency management, such as conservation and sporting entities, local government, and healthcare service providers.

More clearly defining the scope of emergency management would enable clearer definition of the skills and knowledge required by strategic-level emergency managers, including managing political information needs. Collective training and information sessions, such as involving politicians and practitioners in planning and scenario exercises, would not only enable all participants to enhance their familiarity with processes, but, again, would help to delimit mandates *and* expectations.

In light of all of the above, current political shifts towards a reliance on 'emergency management' as a climate change adaptation strategy could represent a retrograde step that ignores hazard and adaptation research and practice showing that dealing with underlying drivers of vulnerabilities is equally, if not more, important than just emergency management. Sole reliance on the emergency management sector for adaptation not only creates greater pressures on that sector (and unrealistic expectations), it has great potential to make us more vulnerable to the impacts of climate change, not less. Reframing the complex policy problem of emergency management as a key component of DRR, rather than the central component, might at least initiate broader institutional shifts towards network governance and, consequently, a reduction in the challenges facing strategic-level emergency management. However, the sector's capacity for a paradigm shift remains untested.

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Endnotes

[1] Each interviewee transcript was given a single, numerical de-identified code, such as interview number (14).

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