

Increasing the resilience of the Deaf Community in NSW to natural hazards

Milestone 7 – Final Report

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Increasing the resilience of the Deaf Community in NSW to natural hazards

Final Project Report - Milestone 7

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List of Acronyms

ABS	Australian Bureau of Statistics
AIDER	Assist Infirm Disabled and Elderly Residents
Auslan	Australian Sign Language
BRAC	Bush Fire Resilience in Aboriginal Communities
CALD Program	Culturally and Linguistically Diverse Program
CapTel	Captioned Telephones
CART	Communication Access Real-time Translation
CBO	Community-based Organisation
CFU	Community Fire Unit Program
DECCW	Department of Environment, Climate Change and Water
EMQ	Emergency Management Queensland
FGDs	Focus Group Discussions
Fire Ed	Fire Education Program
IFAP	Intervention and Fire Awareness Program
IP-relay	Internet Protocol Relay
NGO	Non-government Organisation
NRS	National Relay Service
NSW RFS	New South Wales Rural Fire Service
NSW SES	NSW State Emergency Service
NSW	New South Wales
QLD	Queensland
SABRE	Smoke Alarm Battery Replacement For The Elderly Program
SASS	NSW Smoke Alarm Subsidy Scheme
Senior Ed	Senior Education Program
TTYs	Teletypewriters
VCO	Voice Carry Over system
VRS	Video Relay Service

Key terms and concepts

Adaptive capacity: the preconditions that are necessary to enable a system to adapt to disturbances and are determined by the set of available resources, social structures, and human agency (Nelson et al., 2007).

Auslan: Australian Sign Language

Combat Agency: The agency identified in Displan as the agency primarily responsible for controlling the response to a particular emergency. (Source: SERM Act).

Australian Government Disaster Response Plan (COMDISPLAN): The COMDISPLAN outlines the coordination arrangements for the provision of Australian Government physical assistance to states or territories or offshore territories in the event of a disaster (Australian Government Attorney's-General Department, 2011).

Community: In *Communicating with people with a disability - National Guide for Emergency Managers (Attorney General's Department, 2013a)*, four types of communities are identified: (i) geographic communities (bounded by space or location), (ii) communities of interest (shared interests/characteristics/attributes), (iii) virtual communities (connected online), and (iv) communities of circumstance (shared issue or disaster experience). In this project, we align ourselves most closely with 'communities of interest' i.e. groups of people who interact with each other based on shared interests, attributes, social networks, modes of expression and identity.

Crisis: A distinct yet unexpected and non-routine event (or series of events) that threatens the lives of stakeholders and the viability of the affected organisation or population, thereby creating spheres of uncertainty and unknown outcomes (Caywood and Stocker, 1993, Seeger et al., 1998). In doing so, crisis events demand urgent changes whilst simultaneously opening up opportunities for transformation (Farazmand, 2001).

deaf: Someone who is deaf (denoted by a small 'd') is physically deaf but does not use Auslan or identify with the Deaf Community (Schembri, 2010).

Deaf: Someone who is Deaf (with a capital 'D') belongs to the Deaf Community and uses Auslan as their main language. They consider themselves to be 'normal' and not 'impaired' by their inability to hear - their identity is drawn from their shared culture and language and not from their inability to hear. Deaf people rely mainly on their vision (Auslan and text) to communicate and cannot usually hear speech even when amplified by a hearing aid (Schembri, 2010).

Deaf Community: The Deaf Community is a network of people who share a language, a culture, and a history of common experiences – similar to an ethnic community. The Deaf Community is well organised with national, state and local networks of sporting, recreation, social, special interest and advocacy groups (Schembri, 2010).

Disaster: A disaster is a complex, place-oriented product of a hazardous event and the historical outcomes of socio-political and economic forces (distinct from environmental forces) that have

shaped societal structures and society's capacity to respond effectively to the hazard (Wisner et al., 2004). Disasters occur when a significant number of vulnerable people experience a hazard (or series of hazards) that cause severe damage to livelihoods and overwhelm the system, making recovery improbable without external aid (Wisner et al., 2004).

The State Disaster Plan (Displan): The NSW Displan details emergency preparedness, response and recovery arrangements for New South Wales to ensure the coordinated response to emergencies by all agencies having responsibilities and functions in emergencies (Ministry of Police and Emergency Services, 2011).

Emergency: An event, actual or imminent, which endangers or threatens to endanger life, property or the environment, and which requires a significant and coordinated response (Emergency Management Australia, 2004).

Emergency management: A range of measures to manage risks to communities and the environment (Emergency Management Australia, 2004).

Emergency service organisation: Government agencies in New South Wales that are charged (under the New South Wales State Disaster Plan) with the responsibility for managing or controlling an accredited rescue unit. These agencies include: the NSW Police, Fire and Rescue NSW, NSW Rural Fire Service, Ambulance Service, NSW State Emergency Service, and NSW Volunteer Rescue Association (State Emergency and Rescue Management Act 1989 No 165).

Hard-of-hearing: Those who define themselves as being hard-of-hearing or hearing-impaired see themselves as 'hearing' people with a hearing impairment or medical problem. This group of people usually prefer to use speech, listening (with the help of hearing aids) and lipreading to communicate over Auslan and do not identify with the Deaf Community (Macready, 2009, Schembri, 2010).

Hazard: A threat to humans and their welfare with the potential to cause loss (Smith, 1995).

Human capital: Human capital represents the skills, knowledge, capacity to work, and good health that together enable people to pursue different livelihood strategies and achieve their livelihood outcomes. Attributes include: skills, knowledge, education levels, labour capacity, and health (DFID, 2001).

Mitigation: In the context of disaster management, mitigation refers to structural and non-structural measures undertaken to limit the adverse impact of natural hazards (IFRC, 2012).

Natural hazard: Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNISDR, 2007).

Preparedness: The process of ensuring that an individual, population or organisation (1) has complied with preventive measures, (2) is in a state of readiness to contain the effects of a forecasted disastrous event to minimize loss of life, injury, and damage to property, (3) can provide rescue, relief, rehabilitation, and other services in the aftermath of the disaster, and (4)

has the capability and resources to continue to sustain its essential functions without being overwhelmed by the demand placed on them (BusinessDictionary.com, 2012).

Recovery: Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the affected community or population, while facilitating necessary adjustments to reduce disaster risk to future events (IFRC, 2012).

Resilience: The capacity of a system, population or household to absorb disturbance and reorganise throughout volatile periods of change whilst retaining function, structure and identity (see Folke, 2006, Walker and Meyers, 2004).

Risk: The calculated likelihood of an event or change taking place and negatively impacting an exposure unit (individual, household or population) resulting from a decision or course of action (Smith, 2000).

Social capital: those characteristics of social structure and social relations that facilitate collaborative action and enable greater access to resources. Social capital embodies networks and connectedness, group membership, relationships, and levels of trust and reciprocity (DFID, 2001).

Vulnerability: The degree to which an exposure unit [human groups, ecosystems and communities] is susceptible to harm due to exposure to a perturbation or stress, and the ability (or lack thereof) of the exposure unit to cope, recover, or fundamentally adapt (Kasperson and Kasperson, 2001).

Executive Summary

The purpose of this report is to present a summary of the findings from the New South Wales (NSW) State Government funded project entitled *Increasing the resilience of the Deaf Community in NSW to natural hazards and disasters* that aimed to:

1. Increase the resilience of the Deaf Community to future natural hazards and disasters via improved access to and provision of emergency management information; and
2. Increase the effective resources of NSW emergency service organisations enabling them to deliver their core business (to the Deaf Community) and to improve the deaf awareness for staff and professional officers within those organisations.

The key findings and recommendations presented here are drawn from the three main project outputs: The *Synthesis Review*, the *Deaf Community Needs Assessment* and the *Emergency Services Capacity Assessment*. The completion of this task also fulfils the requirements of Milestone 7 of the project as detailed in the original project work plan approved for funding.

THE DEAF COMMUNITY IN NSW AND THE HAZARDS THEY ARE VULNERABLE TO

The Deaf Community in NSW is a small but diverse group of people who share a language (Australian Sign Language or Auslan), a culture, beliefs and practices that derive from a history of common experiences that are transmitted across generations – similar to an ethnic community. They do not define themselves in terms of their hearing impairment. Instead, having a shared language is the main determinant of inclusion. Australian census data suggest that there are 2,205 people in NSW that use sign language (less than 0.01% of the NSW population) but the numbers are estimated to be three times higher than this. The hazards they are exposed to include: bush fires, wind storms, hail storms, lightening, flash flooding, riverine flooding, coastal erosion and inundation, drought, and heatwaves.

KEY CHALLENGES DEAF PEOPLE FACE WHEN RESPONDING TO HAZARDS

Deaf Community members in NSW face numerous challenges in effectively preparing for and responding to hazards, many of which are related to communication. Key challenges include:

- Language barriers as many cannot speak or communicate effectively in English;
- Risk and response information is often not available in accessible forms;
- Deaf people cannot easily contact emergency services;
- Deaf Community members have a limited understanding of hazard risk and the roles and responsibilities of emergency services. Many believe that the onus of responsibility for their safety in hazard situations lies with the emergency services and not on themselves (the *NSW Displan* states the exact opposite), causing some to have unrealistic expectations of the level of support they will get; and
- There is a tendency towards passivity amongst some community members (a contentious issue), which prevents them from asking for the resources they need and leaves them highly reliant on hearing people to help them and make decisions for them.

EMERGENCY SERVICES PROGRAMS TO SUPPORT DEAF PEOPLE

The NSW Rural Fire Service (NSW RFS), the NSW State Emergency Service (NSW SES) and Fire and Rescue NSW (FR NSW) offer a range of community programs aimed at educating the NSW population about the hazard risks that affect NSW and steps people need to take to better prepare for natural hazards before, during and after hazard events. Whilst none of these natural hazard preparedness program or tools specifically cater to the needs of Deaf people, they do have 19 programs, strategies, and communication tools that are either 'Deaf-friendly' or have elements that may be 'Deaf' appropriate once some alternations are made. This creates a solid platform for producing communication materials and strategies that meet the needs of Deaf people whilst taking full advantage of initiatives that already exist. The most notable of these include:

- NSW SES's *FloodSafe* Program;
- The NSW RFS *Fires Near Me* smartphone and tablet application; and
- The NSW RFS *Bushfire Survival Plan* smartphone and tablet application (being released in November 2013).

Drawing upon the collective findings of the project, we present a series of recommendations (listed in Section 6) that are designed to:

1. Increase Deaf people's accessibility to and provisions of emergency management information and programs;
2. Strengthen social capital within communities and build stronger institutional linkages;
3. Increase the capacity of NSW emergency service organisations to better support the Deaf Community in hazard situations and meet their identified needs; and
4. Facilitate greater Deaf Community engagement in and shared action on disaster and emergency preparedness.

1 Introduction

New South Wales (NSW) (Figure 1) is affected by a range of natural hazards that take human life, cause injuries, and destroy private property and infrastructure. Knowledge of these risks is not the only factor that determines risk perception and subsequent action or inaction (Bird et al., 2010, Paul et al., 2009, Rippl, 2002). However, a lack of risk awareness - due, in part, to limited access to information and no prior exposure or experiences with hazard events - does rob people of the choice to increase their preparedness to those possible risks (US-IOTWS, 2007). Deaf and hard-of-hearing people have no systematic, institutionalised, or reliable means of receiving timely and accurate information about natural disasters and how to respond as they unfold (Kent, 2011).

Actions taken by Queensland Premier Anna Bligh and Emergency Management Queensland (EMQ) during the 2011 Queensland floods and Cyclone Yasi (February 2011) brought this issue to the fore. Premier Anna Bligh and EMQ used Australian Sign Language (Auslan) interpreters to communicate with the Deaf Community during live television conferences for the first time. This initiative was highly commendable but the power failed in the affected communities, causing TV broadcasts, Internet and telephone services to fail. This left Deaf people with few means of receiving emergency response information and highly vulnerable to on-going events.

In NSW there is currently no state emergency strategy or process to effectively assess the needs of the Deaf Community in a disaster setting and provide them with the information and support they need to effectively respond to hazards. Furthermore, we know very little about how Deaf and hard-of-hearing Australians perceive risk, the information sources they use to inform themselves of possible risks, and the subsequent actions (if any) they take to prepare for and respond to hazard events. To address this need, the NSW State Government funded a 2-year project entitled *Increasing the resilience of the Deaf Community in NSW to natural hazards and disasters* through the NDMP grants system. The project aims to:

1. Increase the resilience of the Deaf Community to future natural hazards and disasters via improved access to and provision of emergency management information; and
2. Increase the effective resources of NSW emergency service organisations enabling them to deliver their core business (to the Deaf Community) and to improve the deaf awareness for staff and professional officers within those organisations.

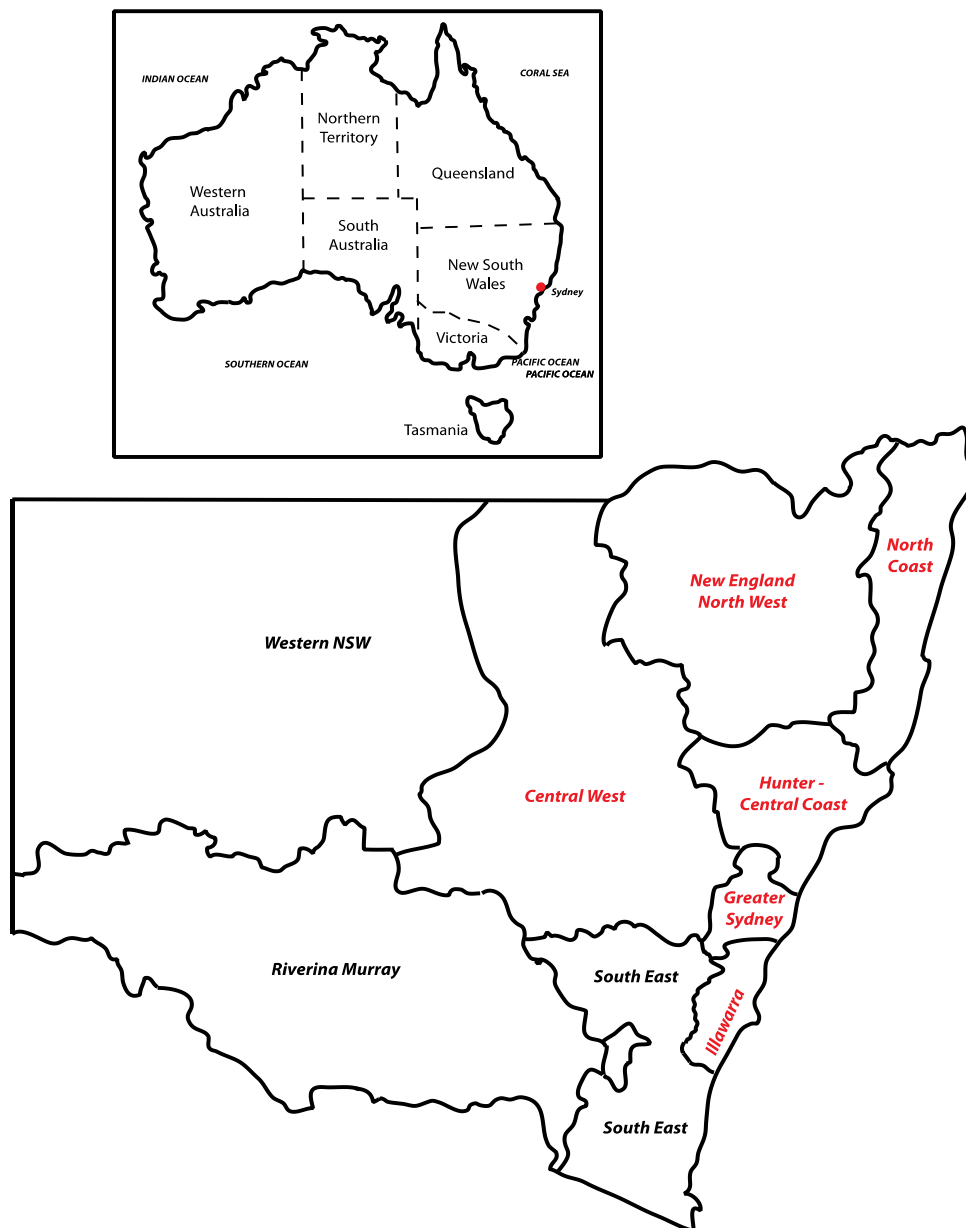


Figure 1: Location of New South Wales, Australia and its regions *

*Regions included in the research are marked in red - see Section 2 for details

The objectives used to fulfil each aim are to:

1. Undertake consultation workshops and to conduct face-to-face interviews with representative members (and stakeholders) of the Deaf Community to determine:
 - a. Determine current awareness of the Deaf Community to natural hazard and disaster risk in NSW;
 - b. Identify the current sources of information used by the Deaf Community to help prepare for emergencies and to respond appropriately in hazard/disaster situations;
 - c. Investigate the preferred forms of communication that will meet the needs of the Deaf Community during live emergency situations in the future; and
 - d. Analyse existing capabilities of the NSW emergency service organisations (specifically, the NSW State Emergency Service, the NSW Rural Fire Service and Fire and Rescue NSW) to deliver risk information and warning messages to deaf people across NSW.
2. Use the results generated from Objective 1 to devise a range of information communication sources/materials and strategies to meet the needs of deaf people in NSW;
3. Trial and test various communication and information sources for selected (high probability) hazard scenarios in NSW with deaf people in NSW; and
4. Assist the NSW State Emergency Service, the NSW Rural Fire Service and Fire and Rescue NSW to devise and implement a communication strategy to specifically cater for the needs of Deaf people in NSW.

Five partner institutions were involved in this collaborative initiative: the Australia-Pacific Natural Hazards Research Laboratory based at the University of NSW; the Deaf Society of New South Wales; Fire and Rescue New South Wales (FR NSW); New South Wales Rural Fire Service (NSW RFS); and the New South Wales State Emergency Service(NSW SES).

This reports presents the key findings of this project and, in doing so, fulfils the requirements of Milestone 7 of the project (see Appendix 1). The remainder of the report is divided up into seven sections. Section 2 outlines our approach and the methods we used to conduct the research. Section 3 identifies the natural hazards that affect NSW and describes the characteristics of the NSW Deaf Community. Drawing upon the reported experiences of Deaf people across the world, Section 4 identifies the challenges that curtail Deaf peoples' access the information and support they need to effectively respond to natural hazards. Here we also present a series of actions that may improve both emergency management strategies in supporting the Deaf Community and increase their resilience and engagement in emergency preparedness processes. Sections 5 and 6 bring our attention back to NSW. Section 5 focuses on the needs and challenges of NSW Deaf Community members in responding to hazards. It details how Deaf people in NSW perceive hazard risk, explores people's understanding of emergency services roles and responsibilities, and examines the actions Deaf people have taken when faced with hazard events in the past and the challenges they have had in effectively responding. Section 5 concludes with the presentation of a range of solutions that Deaf Community members believe will increase their risk awareness and preparedness to future natural hazards. Section 6 looks at the capacity of the emergency services to support and meet the needs of Deaf Community members in emergency and disaster situations. It provides an overview of

emergency management in Australia and NSW and examines the effectiveness of the current programs and tools of the NSW RFS, NSW SES and FR NSW in delivering key preparedness and response messages and instructions to the Deaf Community. Drawing upon the findings of this review, we present a series of recommendations that are designed to: (i) increase Deaf people's accessibility to and provisions of emergency management information and programs; (ii) increase the capacity of NSW emergency service organisations to better support the Deaf Community in hazard situations and meet their identified needs; and (iii) facilitate greater Deaf Community engagement in and shared action on disaster and emergency preparedness. Final reflections and recommendations of further action are then offered in Section 7.

2 Approach and Methods

Taking a holistic and highly contextual approach to disaster management (Calgaro et al., 2013c, Wisner et al., 2004), a four-step approach (Figure 2) was chosen to fulfil the aims and objectives of the project. Our approach aligns closely with the *National Strategy For Disaster Resilience*, which stresses the need to: (i) identify differential risk patterns within and across communities, (ii) strengthen local capacity by placing greater emphasis on community engagement, and (iii) gain a better understanding of the diversity, needs, strengths and vulnerabilities within communities (Council of Australian Governments, 2011b).

The research focussed on six regions in NSW, encompassing both country and city areas where most Deaf people live: the North Coast, New England, the Central Coast, Central West NSW, Sydney, and Illawarra (highlighted in red in Figure 1). There were three reasons for choosing to focus on these regions:

- a. Statistics from the Australian Bureau of Statistics suggest that these are the areas in NSW where Deaf populations are highest (ABS, 2012, ABS, 2013);
- b. The Deaf Society of NSW, our project partner and gatekeeping institution, has offices in these regions, making it easier for us to access Deaf Community members; and
- c. These regions span both country and city areas, which enabled us to obtain the perspectives of people with very different lifestyles and explore possible geographical differences in people's ability to access resources they needed during hazard events.

Six complimentary methods were used throughout the first three phases of the research (see Calgaro et al., 2013a, Calgaro et al., 2013b, Calgaro and Dominey-Howes, 2012 for more details):

- a. Exploratory literature review (Synthesis Literature Review);
- b. Document analysis (Synthesis Literature Review and Emergency Services Capacity Assessment);
- c. Focus group discussions (FGDs) (Deaf Community Needs Assessment);
- d. Semi-structured interviews (Deaf Community Needs Assessment);
- e. Unstructured interviews (Emergency Services Capacity Assessment);
- f. Field observation (Deaf Community Needs Assessment).

These are ‘standard research methods’ used in human and policy relevant research (Bird et al., 2009, Hay, 2005, Hoggert et al., 2002). A summary of the methods used, the information obtained through the application of each method, the sources used and how each method was deployed is provided in Table 1.



Figure 2: Four-step approach to strengthening disaster preparedness for Deaf people

A cross-cultural team comprising of five core members undertook the research: Dr Emma Calgaro (a hearing Research Fellow at UNSW) in partnership with four Deaf Research Assistants (Julia Allen, Nick Craig, Leilani Craig and Sherrie Beaver), Associate Professor Dale Dominey-Howes (Principal Investigator of the project at The University of Sydney - originally at the University of New South Wales) and Kate Matairavula (Deaf Society of NSW). All discussions with the Deaf Community (semi-structured interviews and the FGDs) were undertaken in Auslan.



Source: photo by Julia Allen

Figure 3: Focus group discussion activities in Coffs Harbour

Table 1: Research Methods Summary

Method	Project Stage & Purpose (informational need)	Sources, Participants and Deployment	References
Exploratory literature review	<p>1. SYNTHESIS LITERATURE REVIEW</p> <ul style="list-style-type: none"> Identify who the Deaf Community are, their needs, and their capacity to effectively respond to natural hazards; Identify the types of hazards that occur in NSW; Identify actions that may help strengthen effective action on emergency preparedness for the Deaf Community. 	<p>SOURCES:</p> <ul style="list-style-type: none"> Academic journal articles, reports, government websites, non-government organisation websites, Deaf advocacy group websites, NSW emergency service organisation websites, and intergovernmental organisation websites. 	Flowerdew (1997); Neuman (2000)
Document analysis	<p>1. SYNTHESIS LITERATURE REVIEW</p> <ul style="list-style-type: none"> Gain an overview of the policies and plans that shape emergency management in Australia and NSW; Identify the challenges that inhibit Deaf people's access to information and appropriate support. <p>3. EMERGENCY SERVICES CAPACITY ASSESSMENT</p> <ul style="list-style-type: none"> Gain an overview of the policies and plans that shape emergency management in Australia and NSW; Assess existing capabilities of the NSW emergency service organisations to effectively deliver risk information and response plans and instructions to Deaf people; Identify current programs that may be 'Deaf' appropriate, assess their accessibility to Deaf people in their current form, and examine ways that these existing programs could be altered to be more 'Deaf' accessible. 	<p>SOURCES:</p> <ul style="list-style-type: none"> Emergency management policies and plans, programs and strategies used at the federal level in Australia and within NSW (including state, regional, district, and local policies and plans). NSW SES, NSW RFS and FR NSW documents and summaries detailing current programs, strategies and communication tools. Reports, government websites, non-government organisation websites, Deaf advocacy group websites, NSW emergency service organisation websites, and intergovernmental organisation websites. 	Clark (1997); Creswell (2009).
Focus group discussions (FGDs)	<p>2. DEAF COMMUNITY NEEDS ASSESSMENT</p> <ul style="list-style-type: none"> Ascertain awareness levels of localised natural hazards risk among Deaf people; Determine the types of natural hazards Deaf people have experienced throughout their lifetime; Identify current challenges Deaf people have in preparing and responding to natural hazards; Identify what support Deaf people need and want; Determine the most effective communication mediums for disseminating preparedness and response information and instructions to Deaf people; Identify a range of actions designed to improve Deaf peoples' preparedness levels and increase the capacity of the emergency services to effectively assist Deaf people. 	<p>PARTICIPANTS:</p> <ul style="list-style-type: none"> 31 FGDs were undertaken in total: 15 in Phase 1 and 16 in Phase 2; A broad spectrum of NSW residents from the six regions. They spanned all ages (above 18), professions, living arrangements and marital status, gender, and location (city and country residents were well-represented); Whilst the sample was dominated by culturally Deaf individuals (in line with the project's mandate), some deaf people (those who were not culturally Deaf), hard-of-hearing people and hearing individuals also attended some of the sessions. <p>DEPLOYMENT:</p> <ul style="list-style-type: none"> The FGDs were undertaken in 2 phases: Phase 1 (late August - mid December 2012) and Phase 2 (April - May 2013); Participants of the Phase 1 FGDs were recruited via: the networks of the Deaf Society of NSW and Deaf Society staff; personal and professional referrals; professional and social networks (both formal and informal) operating within the NSW Deaf Community; fliers posted on the Deaf Society's Facebook and Internet pages; adverts in the <i>Deaf Herald</i>; and snowballing techniques; Two additional recruitment methods were used to enlist participants in Phase 2. Direct invites were sent to Phase 1 FGDs participants via email or SMS. A short Auslan video advertising the Phase 2 FGDs was also created and posted on the Deaf Society's Facebook and Internet pages. 	Cameron (2005); Goss and Leinbach(1996); Kitzinger(1994).
Semi-structured interviews	<p>2. DEAF COMMUNITY NEEDS ASSESSMENT</p> <ul style="list-style-type: none"> Ascertain how Deaf people identify themselves and their communities; Identify the communication mediums and support networks Deaf people use in daily life and in times of need; Gauge levels of risk awareness and preparedness including how much Deaf people know about the role of emergency services during all phases of the disaster cycle; Gain insights into how Deaf and hard-of-hearing community members have coped with and responded to past emergency and natural hazard disasters and the challenges they have faced in gaining access to the resources they needed; Ascertain what type of support Deaf people need and want to help them respond effectively to natural hazards. 	<p>PARTICIPANTS</p> <ul style="list-style-type: none"> 38 of the 39 interviews conducted were undertaken with Deaf or hard-of-hearing participants. Despite the small sample size, the research was designed to be as representative as possible. One participant was a hearing Auslan interpreter who had intimate knowledge of Deaf communications issues and had witnessed first hand the challenges Deaf people faced when responding to the January 2011 floods and Cyclone Yasi (February 2011); 15 of the 39 participants had had past experiences with natural hazards. <p>DEPLOYMENT:</p> <p>Participants were recruited from the Phase 1 FGDs, personal referrals, social networks operating within the NSW Deaf Community, and snowballing techniques</p>	
Unstructured interviews	<p>3. EMERGENCY SERVICES CAPACITY ASSESSMENT</p> <ul style="list-style-type: none"> Assess existing capabilities of the NSW emergency service organisations to effectively deliver risk information and response plans and instructions to Deaf people; Identify current programs and communication tools that may be 'Deaf' appropriate, assess their accessibility to Deaf people in their current form, and examine ways that these existing programs and tools could be altered to be more 'Deaf' accessible. Ascertain any challenges that the emergency service may have in delivering and monitoring effective community programs (related to current levels of social, human, economic capital) including additional programs for the deaf and hard-of-hearing; Explore possible communication and disaster preparedness options that both meet the needs of the deaf and hard-of-hearing communities and may be feasible/worth exploring given the emergency services current resource levels and practical constraints. 	<p>PARTICIPANTS:</p> <ul style="list-style-type: none"> Key informants from the NSW SES, NSW RFS, and FR NSW that work in communications and/or on relevant community-based programs. <p>DEPLOYMENT:</p> <ul style="list-style-type: none"> Key informants were contacted initially via email and/or phone. Follow-up discussions were then undertaken in person, over Skype and via email to obtain more detail or to clarify information. 	Dunn (2005), May (2001)
Field observation	<p>2. DEAF COMMUNITY NEEDS ASSESSMENT</p> <ul style="list-style-type: none"> To reflect upon and record the issues being discussed in the interviews and FGDs and identify common or evolving themes as they emerge from the data collecting process 	<p>DEPLOYMENT:</p> <ul style="list-style-type: none"> Observations were carried out throughout the fieldwork period during open-ended interviews and FGDs and were recorded in a fieldwork diary and in photographs. 	Corti(1993); Kearns (2000).

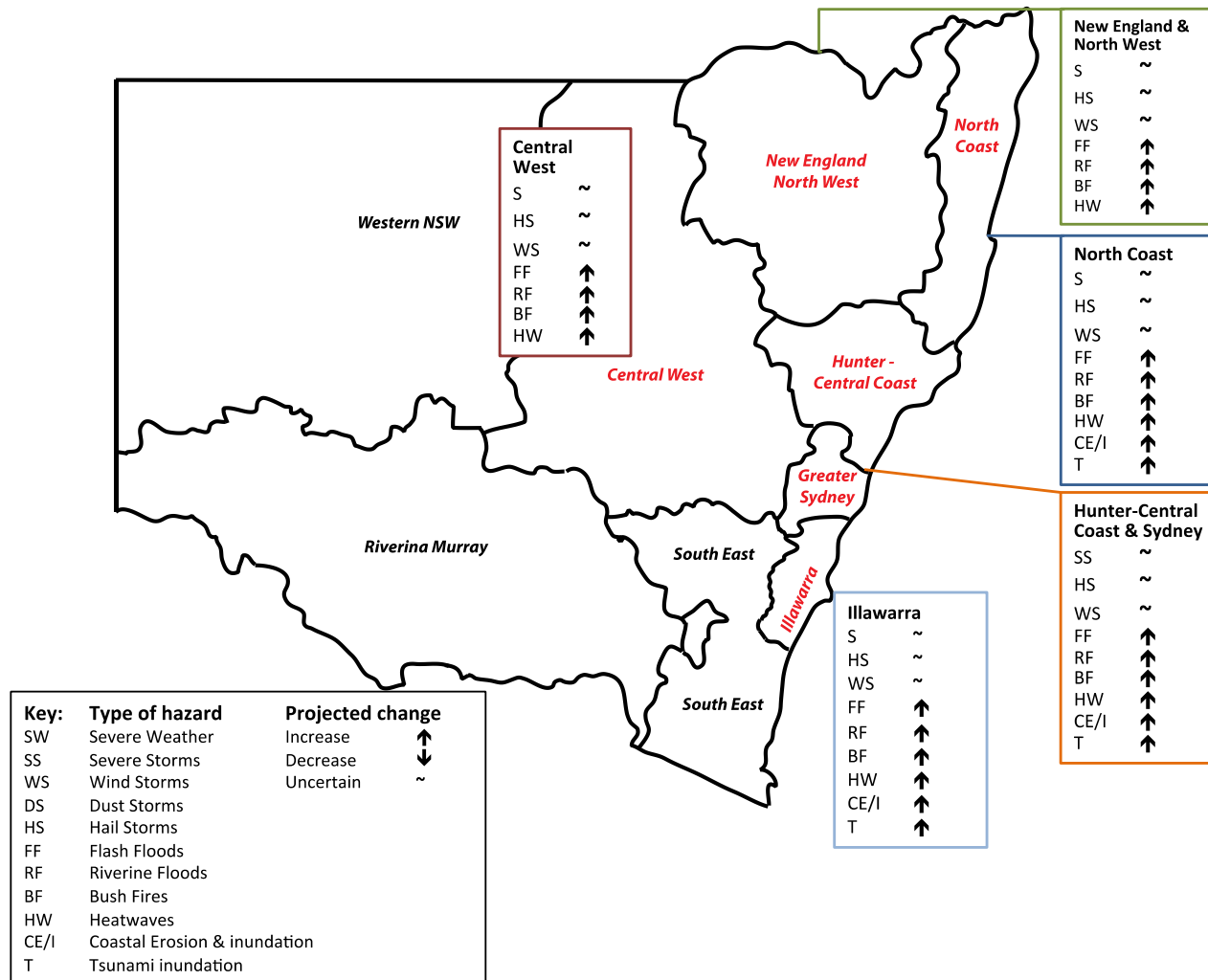
3 A community at risk

Reducing natural hazard risk levels and bolstering preparedness begins with identifying *who* are at risk (the focal population) and the nature of that risk (*to what*). So, this section outlines the types of natural hazards that occur in NSW and describes the characteristics of the Deaf Community in NSW.

3.1 Natural hazards in New South Wales

New South Wales (NSW) residents are exposed to several types of natural hazards. These include bush fires, wind storms, hail storms, lightening, flash flooding, riverine flooding, coastal erosion and inundation, drought, and heatwaves (DECCW, 2010e, Emergency Management Australia, 2006). Bushfires are one of the most destructive forces of nature. However, severe storms are the most common natural hazard in Australia and are responsible for inflicting the most damage in terms of insurance costs in Australia and NSW (Emergency Management Australia, 2006, Insurance Council of Australia, 2012).

Climate change projections for NSW indicate that the severity and frequency of bushfires, heatwaves, and coastal erosion and inundation (due to increases in sea-levels rise) are likely to increase (DECCW, 2010e). The risk of bushfires is expected to increase the most. Projected increases in the number and intensity of days of high temperature, low humidity and higher evaporation levels will increase the frequency and intensity of fires, with the occurrence of days of very high to extreme fire-risk possibly rising by 10–50% in all regions (DECCW, 2010e). Heatwaves are also expected to increase in frequency and severity due to projected mean maximum temperature increases of 1-3°C by 2050 (DECCW, 2010e). Sea levels along the NSW coast are projected to rise as much as 40 cm above 1990 mean sea levels by 2050 whilst a 1% increase in storm surge is deemed possible (DECCW, 2010e). A projected rise in sea level of up to 40 cm is likely to result in a recession of sandy parts of the coastline of up to 20–40 metres by 2050 (DECCW, 2010e). It is unclear what impacts climate change may have on future storm (including thunderstorms, hailstorms, lightening or flood event frequencies and patterns (DECCW, 2010e). However, flood risk is expected to increase due to the rising developmental pressures in low-lying coastal areas (DECCW, 2010e). The geographical patterns of natural hazards events experienced across the state are presented in Figure 4.



Sources: DECCW (2010a, 2010b, 2010c, 2010d, 2010f, 2010g)

Figure 4: Natural hazards patterns in NSW by region and climate change projections

3.2 The Deaf Community

“Deaf people know how I feel, what my frustrations are and my feelings. Hearing people do not know or will ever understand that. It doesn’t matter if a hearing person has a deaf family, this person will still never fully understand 100% of what it’s like to be a Deaf person” (New England resident).

One of the most important tasks for the emergency manager is to understand who the stakeholders are, the numbers of each stakeholder group, and what is important to them (Boughton, 1998, Ferrier and Planner, 1999, Phillips et al., 2005). But the identification of *who* involves more than the listing of demographics; it involves understanding how people identify themselves and how they operate in their daily lives. These characteristics and behavioural tendencies are hooks that disaster and emergency managers can use to build effective disaster management strategies that capitalise on the strengths of a population and provide resources and support where needed (Wisner, 2003).

The Deaf Community in NSW is a small but diverse group of people who are united by a shared language (Australian Sign Language or Auslan), culture and a common way of relating to the world deriving from a history of common experiences that are transmitted across generations – similar to an ethnic community (Padden and Humphries, 1988, Schembri, 2010). They do not define themselves in terms of their hearing impairment. Instead, having a shared language is the main determinant of inclusion. A distinction between the ‘culturally deaf’ and ‘audiologically deaf’ populations is reinforced in the written word (Padden and Humphries, 1988). Culturally deaf people refer to themselves as ‘Deaf’ (spelt with a capital ‘D’) whilst those who are physically deaf with no links to the Deaf Community are ‘deaf’ (small ‘d’) (Padden and Humphries, 1988).

The exact numbers of Auslan users in Australia and NSW is difficult to ascertain due to the ambiguity of the Australian Census questions relating to language. According to Australian Census data (see ABS, 2013), there are an estimated 8,406 Auslan speakers (9,935 who speak a type of sign language) in Australia and 2,205 in NSW (rising to 2,623 when including all sign languages). This represents less than 0.1% of the population at both geographical levels (see ABS, 2013). However, Hyde and Power (1991) and the Deaf Society of NSW suggest that the true number is closer to three times higher than official figures suggest. Inaccuracies in the data on how many Deaf people there are in NSW and where they are located makes it extremely difficult for emergency service organisations to know where to allocate their resources and how to effectively include this population in their planning.

It is very important for Deaf people to feel a part of the Deaf culture and community. It fosters a sense of belonging and creates a sphere of inclusion, acceptance, trust, and equality. According to those we interviewed, the characteristics that define the NSW Deaf Community include (Calgaro et al., 2013a): shared language enabling clear and in-depth communication (85%); and being a minority language cultural group with a common identity and values

(49%); common interests (44%); and common experiences (41%). However, levels of social cohesion and connectedness varied greatly across the six regions. Residents in both the Northern NSW and Illawarra generally felt that they belonged to a strong cultural community. Responses from residents in Sydney, New England and the Central Coast were mixed, whilst Central West residents overwhelmingly felt that their community was weak and lacked strong social networks. This has implications for emergency and natural hazard management - those areas that have higher levels of social cohesion have larger support networks to draw upon in times of need. We revisit this point and discuss ways to increase social cohesion in Sections 5.4 and 6.4. The existence of stronger networks also provides emergency services with natural entry points for community engagement.

4 Challenges in supporting Deaf people in the natural hazard context

There is limited information on the experiences of Deaf/deaf and hard-of-hearing people in Australia have in responding to disaster situations here but lessons can be learnt from experiences recorded from around the world. Here, we identify the challenges that Deaf/deaf people, on the one hand, face in preparing and responding to hazardous events as well as those that emergency service organisations have in effectively supporting deaf people prior, during, and after an emergency or disaster event. Drawing upon these international experiences, we conclude this section by identifying a set of general recommendations aimed at improving disaster preparedness and response levels amongst the Deaf/deaf and hard-of-hearing populace.

4.1 Challenges in supporting the Deaf Community in emergency situations

The main challenges the Deaf Community face when responding to emergency situations or disasters are related to communication (Ferrier and Planner, 1999, Wisner, 2003, Sullivan and Häkkinen, 2006, Wisner, 1993, DHHCAN, 2004, Malizia et al., 2008). Many are unable to receive local emergency notification messages prior to evacuation or whilst in shelters. They also have difficulties obtaining information on how to access the resources they need for recovery.

4.2 Challenges for the emergency services

Emergency management organisations experience multiple challenges in effectively supporting Deaf/deaf people and those with disabilities effectively prepare and respond to events. These challenges are summarised in Boxes 1-3.

Box 1: Problems with supporting Deaf/deaf and disabled people prepare for disasters

Good intentions but no action:

- Conventional emergency management approaches rarely go beyond acknowledging that people with disabilities need to be 'helped' by emergency response and support services when a disaster occurs (Sullivan and Häkkinen, 2006, Wisner, 2003).
- Non-government support organisations (NGOs) express strong intentions to include disabled people in their disaster response policies, plans, and actions. However, these policies and statement of intent often fail to materialize into practice or are not well known. The disabled are often included under the broader banner of 'vulnerable groups' earmarked to receive relief, aids, and equipment, who are usually referred onto other 'specialist organisations' for assistance (Kett et al., 2005).

Exclusion from planning and support mechanisms

- People with disabilities and support/representative organisations are often left out of preparedness and planning activities (DHHCAN, 2004, Kett et al., 2005, National Council on Disability, 2005). These include analyzing and documenting the possibility of an emergency or disaster and the potential impacts, and community consultations that help inform the design of emergency preparedness and response strategies (National Council of Disability, 2005). Cumbersome bureaucracy and a shortage of funds are cited as reasons for this (Fjord and Manderson, 2009, Kett et al., 2005).
- The strengths and skills of community-based organisations (CBOs) serving people with disabilities are not well integrated into the emergency service plans (National Council on Disability, 2005). Nick et al. (2009) argue that CBOs are underutilized resources in the disaster context: they best understand the needs of the groups they work with and are trusted. Accordingly, CBOs are well-placed to: (i) help inform emergency services of the needs of the groups they work with prior to and after the onset of an event; and (ii) to help mobilize community and local resources in crisis situations (Nick et al., 2009).

Limited access to knowledge

- Deaf/deaf and hard-of-hearing community members often lack of knowledge about where and how to access disaster preparedness information and training both prior to and during a disaster event, a problem that they share with 'hearing' people (Calgaro, 2010, Kent, 2011, National Council on Disability, 2005, Waterstone and Stein, 2006). This includes a lack of knowledge and coordination of existing disability-related resources (National Council on Disability, 2005).
- Emergency preparedness information is not always available in accessible formats. These include large print, disks, audio files/MP3, visual explanations of procedures accompanied by simple text, and accessible media, including web sites or captioned and audio-described films and videos (National Council on Disability, 2005).

Training of emergency respondents and staff is inadequate

- There are few training opportunities for first responders on the specific needs of people with disabilities and activity limitations. Instead, first responders rely on street experience and react to situations as they arise (National Council on Disability, 2005).
- Shelter staff are not trained how to assist deaf and disabled people (National Council on Disability, 2005). Furthermore, legal regulations may disallow disability specialists to provide help in disaster shelters if they cannot provide the required documentation on the spot (Waterstone and Stein, 2006).

Box 2: Problems with assisting Deaf/deaf and disabled people during disasters

Difficulty in locating vulnerable populations

- It can be difficult to clearly identify and locate vulnerable populations during an emergency (Nick et al., 2009).

Communication issues

- A lack of captioning on major broadcast systems, as well as on internet news sites, creates anxiety when deaf people can see pictures of events as they unfold but cannot ascertain what's happening and where it's happening. Furthermore, scrolling messages sometimes blocked captions, making it difficult for deaf people to read captioned information (National Council on Disability, 2005).
- When electricity is cut, deaf people are unable to use telecommunication equipment dependent on electricity causing them to miss out on audio announcements broadcast in public spaces and workplaces (National Council on Disability, 2005).
- Triple 0 centers may be lacking the latest telecommunications technologies and therefore might not be prepared to handle voice carry over (VCO), IP-relay (Internet protocol), VRS (video relay service), and CapTel (captioned telephones) calls deaf and hard of hearing people (National Council on Disability, 2005).
- The timing of warnings and ensuring that the Deaf Community has access to warnings outside the home and workplace is also difficult to manage (Kent, 2011).
- Written updates (including the text of oral announcements) on the disaster event as it unfolds and subsequent response instructions can also be missing from public areas or shelters (National Council on Disability, 2005). This leaves the Deaf/deaf and hard-of-hearing (as well as members of the 'hearing population' that are out of hearing range) without any way to get written updates (National Council on Disability, 2005). These types of updates are particularly important when other communications systems like the Internet, and phone services go down.

Inappropriate shelter facilities and services

- Not all shelters are equipped with the facilities needed to serve those with disabilities (National Council on Disability, 2005, Waterstone and Stein, 2006). After Hurricane Katrina and Rita, the US National Organization on Disability reported that less than 30% of shelters had access to sign language interpreters; 80% lacked TTYs; 60% did not have televisions with open caption capabilities; and only 56% had areas where oral announcements were posted (Waterstone and Stein, 2006).
- Suitable communication mediums are often missing in evacuation points and shelters. These include auxiliary aids and services such as sign language interpreters, CART (communication access real-time translation) readers, people to assist with completing paperwork, and people to take notes (National Council on Disability, 2005). After Hurricane Katrina in 2005, deaf people were isolated in an area designated as "Deaf Area" and were left without signing translators and public address announcements never reached them (Sullivan and Häkkinen, 2006).
- Family units are sometimes split up, causing deaf people to be separated from their main support systems who often act as interpreters for them (National Council on Disability, 2005, Waterstone and Stein, 2006).
- Where shelters have lacked the technology or skilled staff to enable clear communication between deaf people and emergency response staff, there have been instances where Deaf Community members have been turned away (National Council on Disability, 2005, Nick et al., 2009).

Box 3: Problems with assisting Deaf/deaf and disabled people after disasters

Limited provision of appropriate trauma counselling:

- In the aftermath of an emergency or disaster, post-event trauma counseling is rarely available for Deaf people due to a lack of counselors with sign language capabilities and the absence of sign language interpreters (National Council on Disability, 2005). This has led to traumatised Deaf individuals being asked to assist in counseling another deaf person seeking the same services, which only further compounds the trauma.

Failure of emergency management organisations to incorporate lessons learnt into future strategies

- Information and lessons learned pertaining to accessibility to information, appropriate facilities (shelters, first aid stations, portable toilets, temporary housing), as well as shelter identification, access, management, training, and services are not shared across organisations and states (National Council on Disability, 2005). This problem is not isolated to practices relating to assisting deaf and disabled individuals or communities; it is a widespread challenge in disaster management where lessons are often 'observed' by government and emergency response agencies but not necessarily incorporated into future practices (see Birkland, 2006, Thomalla et al., 2009, Zou and Thomalla, 2008).

4.3 Lessons learnt and recommendations for improving support for Deaf/deaf people

Drawing upon lessons learnt from international emergency and disaster experiences, here we presents 10 recommendations aimed at increasing Deaf people's resilience and improving the support emergency management organisations provide to deaf and hard-of-hearing individuals:

1. *Deaf people need to take ownership of their own preparedness* and safety to the degree allowed by their disability (National Council on Disability, 2005). This not only increases their resilience to hazard but also helps them maintain the dignity and independence that lies at the heart of the disability movement (National Council on Disability, 2005). But to do this, they need support;
2. Emergency services require access to reliable information on the location and needs of the diverse Deaf Community and hard-of-hearing people (Kett et al., 2005, Parr, 1987);
3. Increase inclusion in emergency planning and management by including Deaf/deaf and hard-of-hearing representative bodies, community-based organisations, disability experts, and Deaf/deaf and hard-of-hearing people in all stages of the emergency management and disaster planning process. This requires the development of strong relationships between emergency management organisations and deaf and hard-of-hearing representative and support bodies and (DHHCAN, 2004, National Organization On Disability, 2002, Nick et al., 2009, Parr, 1987, Waterstone and Stein, 2006);
4. Deaf and hard-of-hearing people should be supported in enhancing their knowledge of both the types of risk that they may face and how best to respond in the event of an emergency or disaster (Parr, 1987, Phillips et al., 2005, Sullivan and Häkkinen, 2006);

5. Emergency services personnel and first responders require training on the specific needs of Deaf/deaf people so they know how to better support them (Kett et al., 2005, National Council on Disability, 2005, Parr, 1987);
6. Appropriate services and facilities that suit the requirement of deaf people need to be made available in evacuation shelters. If this is not possible in all locations, then both shelter staff and deaf people need to be made aware of centres that can specifically cater for deaf and hard-of-hearing people (National Council on Disability, 2005);
7. It is imperative that communication methods need to match the needs of the end-users. Furthermore, making information on the needs of deaf and hard-of-hearing people will encourage wider community awareness of their needs (Kent, 2011, National Council on Disability, 2005);
8. It is vital that the language used in emergency warnings and signage (including the symbols and pictograms used on signage) are understood across cultures and languages, including those that are specific to sub-cultures that exist within populations (Malizia et al., 2008);
9. Multiple methods of communication are required to ensure that Deaf/deaf and hard-of-hearing people get reliable access to the information they need to effectively respond (Kent, 2011).
10. Combining the following communication mediums in emergency warning and evacuations strategies is considered the best strategy for ensuring widespread access to information (Malizia et al., 2008, Nick et al., 2009, Sullivan and Häkkinen, 2006, Kent, 2011, National Council on Disability, 2005, Edmiston, 2011, Stephens, 2011):
 - Television broadcasts with clear captioning;
 - Email or text alert to mobile phones;
 - Video sign mail through video relay operators;
 - Call-in number for updates;
 - A national reverse 000 phone-based public warning system that can quickly target a precise geographic area and saturate it with thousands of calls per hour. This service would however need to be able to make TTY calls; and
 - Taking full advantage of new communication technologies such as Internet services, mobile phone services (particularly smartphone applications and SMS warning systems) and social networks (especially *Twitter*) to effectively reach both urban rural or scattered communities.

5 NSW Deaf Community experiences, knowledge and needs

As argued in Section 4, very little is known about how Deaf/deaf Australians perceive risk, the information sources they use to inform themselves of possible risks, and the subsequent actions (if any) they take to prepare themselves prior to the onset of hazardous events. We also have limited information on the actions they take during an event; the sources and type of information they rely on for directives, the networks (personal or community-based) they turn to for assistance when their individual coping capacities are overwhelmed and their capacity to recover following the emergency or disaster event. In this section we redress these knowledge gaps by providing information on each of these points in the context of NSW. We conclude by presenting a range of solutions Deaf Community members in NSW believe will increase their risk awareness and help them better prepare and respond to future natural hazards.

5.1 Knowledge of risk and the role of emergency services and subsequent preparedness levels

Deaf people's knowledge of basic terms often used in disaster and emergency preparedness information material (crisis, emergency, disaster, hazard, and natural hazard) was low. Knowledge levels and perceptions of natural hazard risk amongst Deaf Community members were also low. Risk perceptions that Deaf people have of natural hazards that affect NSW (generally) and the place in which they live also differs greatly from natural hazard occurrences and risk levels identified by the Department of Environment, Climate Change and Water (DECCW). People cannot plan or effectively respond to risks that they don't know about or to event processes that they don't fully understand. The vast majority of people interviewed (79%) did not have an emergency plan due to people: (i) not having time and (ii) not knowing or feeling like they needed one. Most of those that did have an emergency plan also had experienced natural hazards in the past. The majority of those interviewed did have some understanding of climate change; 64% of people believed that climate change would affect them in some way.

Deaf people in NSW are also largely unaware of the roles and responsibilities of the NSW State Emergency Services, the NSW Rural Fire Service and Fire and Rescue NSW in relation to supporting community members before, during or after a natural hazard has occurred. Being unclear of the roles and responsibilities of the emergency services and a subsequent reliance on assistance that 'may never come' leaves people extremely underprepared and more vulnerable to natural hazards.

Advances in communication mediums have given Deaf people greater autonomy in accessing information. The widespread usage of the mobile phone (with SMS facilities) and smartphones (enabling constant access to instant chat programs like Skype, MSN messenger, and FaceTime) has resulted in a shift away from Deaf people accessing information second-hand from hearing individuals to them accessing information directly. Smartphones are the preferred medium but the higher costs of smartphone plans means not all Deaf/deaf people can afford them. The most favoured means through which to access risk information is family and friends, followed by television, text messages (largely received from family and friends), the Internet and social media (Facebook).

5.2 Lessons learnt from past hazard experiences

A key objective of this project was to gain insights into how Deaf people have prepared for, responded to, and recovered from natural hazards in the past and to explore the challenges they faced. Preparedness and adaptive capacity is shaped by past responses to problems and challenges, informed by knowledge gained from these experiences. People are adapting to change every day; this knowledge and pattern of experiences cannot be overlooked or undermined (Cannon, 2008).

Our findings suggest that Deaf people's ability to anticipate and plan for the hazard events they faced was curtailed by a limited knowledge of the risks. The majority of Deaf people we interviewed had no prior experience with hazards before the event that affected them. Consequently, they had no idea about what to do when they were confronted with the hazard event in question. Those that had experienced more than one natural hazard in their lifetime were better prepared and more likely to have an emergency response plan in place that the family followed.

Most had not received any warnings prior to the experienced event(s). The consequences of not receiving any warnings (limited access to human capital) included: confusion, helplessness, panic for themselves and their children, and a complete state of unpreparedness. During the hazard event, communication was found to be the biggest issue Deaf people faced when responding to natural hazards. There was a lack of information on how to respond effectively during the hazard events people experienced (including what to do, where to go, who to contact, and how to access basic resources like food, shelter, money, and clothes) and a lack of appropriate communication mediums through which to obtain this information. The most common communication mediums used to access information on the changing nature of the hazard and what to do as the event unfolded were: face-to-face contact with other people including members of the public via the written word; SMS; the Internet and email; and television.

Access to strong social networks proved instrumental in helping people cope with and respond to the hazards they faced. Deaf people often turned to trusted social networks - family, friends, neighbours (Deaf and hearing), school teachers, trusted employers, and Deaf support organisations - for emotional and logistical support and information during and after the hazard events they experienced.

In many cases, support offered by the government was seen to fall short of meeting the needs of Deaf people causing frustration and mistrust in the government's understanding of their needs and subsequent ability to support them. People's experiences with the emergency services were also largely negative. Some people did receive support from the emergency services at some stage during the hazard events but it was felt that assistance often came too late. The main issues Deaf people had when interacting with emergency services personnel and first responders include:

- Emergency services personnel and first line responders exhibiting discomfort with having to communicate with Deaf people directly. Instead, personnel regularly chose to converse with any hearing individuals (even if the hearing individuals present were children);
- Communication methods used to disseminate evacuation warning and instructions (door-knocks undertaken by hearing people and audio loudspeakers) were largely ineffective causing Deaf people to be left stranded for hours, not knowing what to do and where to go;
- First responders not having enough patience to communicate with Deaf people via pen and paper and not offering to organise Auslan interpreters; and
- The language used by emergency services personnel and first line responders is too advanced for some Deaf people to understand.

This outcome is detrimental to future preparedness levels. Frustration and apathy felt by Deaf Community members leads to a growing disconnect between communities and government support structures (in this case the emergency services and first line responders). This may not only deter community members from seeking help from these same organisations in the future (thereby removing a needed support structure and increasing their vulnerability to future events) but it also erodes the effectiveness of governance structures and processes put in place to help the very people they are alienating.

Lessons taken from these past experiences also suggest that Deaf/deaf support organisations are well placed to help facilitate greater access to the resources Deaf people need to cope with the impacts of the experienced events and recover afterwards. Following the 2011/2012 Christchurch earthquakes, Deaf Aotearoa (main Deaf support organisation in New Zealand) took the following actions in cooperation with emergency services to ensure deaf people received the support they needed:

- Established a list of deaf people in the affected areas and contacted these people on a regular basis to ensure that they were okay;

- Organised counselling for Deaf Community members;
- Scheduled specific consultation times (via SMS) when Deaf people could communicate with emergency services personnel via a team of Deaf Aotearoa interpreters about the state of and availability of basic services (water, sanitation), where the emergency centres were located, and what to do in the event of aftershocks and how to prepare for future events; and
- Partnered with the emergency services in providing Deaf people with constant updates as the event unfolded (including the supply of interpreters in media broadcasts) and during the initial stages of the recovery process. This ensured people could receive information updates and instructions on what to do and how to better prepare themselves.

The active presence of these representative organisation help create spheres of safety and trust, and provide effective support for Deaf people in emergency situations. Consequently they are a natural facilitating link between Deaf/deaf individuals, the emergency services, and the resources Deaf/deaf people need to effectively cope and respond to natural hazards. The collaborative actions cooperation between Deaf Aotearoa and emergency services could be used as a model for improving institutional cooperation between NSW emergency services and the Deaf Society of NSW. We discuss this recommendation further in Section 6.4.

5.3 Key challenges Deaf people face when responding to hazards

The challenges identified from Deaf people’s past hazard experiences (Section 5.2) correspond to those identified by the NSW Deaf Community and the experiences of other Deaf people around the world (Section 4.1). Language barriers and not having access to information in accessible forms greatly undermines Deaf people’s response capabilities. However, the findings also indicate that not all of the identified challenges are related to communication. Cultural differences, education, mismatched expectations, and social cohesion also play a role in influencing Deaf response capabilities. The key challenges are summarised below.

Communication barriers - the biggest challenge

- Language barriers - Auslan is the preferred language for most, with English often being the second language Deaf people learn;
- Risk and response information is often not available in accessible forms;
- Deaf people have limited options for contacting emergency services during a hazard event;
- There is a shortage of Auslan interpreters in some parts of NSW (generally), making it particularly difficult for Deaf people to access them during emergency events.

Socio-cultural challenges to Deaf preparedness

- There is a lack of Deaf awareness amongst emergency services and the hearing public, which hinders their ability to effectively help Deaf people;
- There is a mismatch between what Deaf people expect emergency services to do for them in an emergency situation and the responsibilities emergency services are mandated to provide under the *NSW Disaster Plan (Displan)*;
- Strength of community and social support networks varies across NSW, which leaves some people (particularly those in country areas) without adequate support and feeling isolated in a disaster or emergency event;
- Passivity versus activism and empowerment - some Deaf Community members believe that Deaf people are too passive in asking for the resources they need and rely too heavily on hearing people to help them and make decisions for them. Limited educational opportunities, coupled with wider societal beliefs that deaf people need to be taken care of, have caused many Deaf people to rely on hearing people to make decisions for them. Older Deaf people also attribute this tendency to their limited exposure to and experience with advocating for themselves and their rights in a hearing world. This is a contentious cultural issue that is by no means universal. There are many Deaf people who are independent and feel empowered and who are looking for opportunities that would allow them to get more involved in natural hazard preparedness activities.

5.4 Preparedness solutions to increase Deaf people's resilience to hazards

Deaf Community members recognise the need to take full advantage of a wide range of communication and telecommunication options/mediums to effectively disseminate information about natural hazard risk levels, warnings, and instructions on what to do. They also recognise the important role social networks play in assisting them in times of need and the need to capitalise on existing strengths to further improve these linkages within and across communities. In light of these challenges and identified needs, Deaf people in NSW have therefore identified a wide range of strategies and action points that they believe will increase their risk awareness and help them better prepare and respond to future natural hazards. These strategies and desired tools are grouped into four categories and presented in Tables 2-5. These strategies have also been ranked in terms of importance to Deaf Community members.

Table 2: Solutions to improve access to information identified by deaf people

Rank	Improving access to information[†]
1	More visual hazard warning signs are needed in public areas
2	Central register system administered by emergency services/local councils for all those with disabilities to register their needs and contact details to make it easier for emergency services to know how many Deaf people there are, where they are and what their needs are
3	More interpreters needed (Auslan& Deaf-Blind) during emergencies
4	Door-to-door updates by the emergency services or Deaf Liaison Officers during hazard events
5	Access to GPS system that tracks weather conditions, road blocks and provides alerts on approaching natural disasters
6	Need for plain text with pictures for written material
7	Car radio services with scrolling hazard captions
8	Regular newsletters and pamphlets on natural hazard risk, preparedness, and response from councils/emergency services or Centrelink
9	Deaf support organisations to disseminate natural hazard and emergency information
10	Lasers lights of updates for hazards shown on wind-screens in cars
11	Visual hazard signs that states "If you see a bushfire or floods, please call this #". People would like the same with an SMS contact number

Table 3: Mobile and landline telecommunication solutions to current needs

Rank	Mobile and landline telecommunication solutions
1	Establish a direct SMS "000" emergency contact number - no 3rd parties i.e. through National Relay Service (NRS) or Video Relay Service (VRS) as is now the case with the new 000 emergency system
2	Receive SMS Emergency Warning Alerts from NSW emergency services
3	Video Relay Service (VRS) to contact emergency services
4	Access to SMS severe weather updates from weather bureaus
5	Creation of smartphone apps like <i>Silent Tweets</i> or the NSW RFS app <i>Fires Near Me</i>
6	Improve reception for mobiles especially in rural areas
7	Have an SMS '000' two way conversation contact number instead of one way
8	Government to subsidise or provide smartphones
9	Improve affordability of better mobile and landline services (Telstra)
10	Faster responses times from NRS and VRS
11	Training on use of smartphone and apps for senior citizens
12	Alert icon app that alerts emergency services and personal contacts where you are in emergencies
13	Make VRS service available 24/7
=14	Create SMS alert function for 131500transport line to enable deaf people to get updates about network problems
=14	Introduce a 'Chat' SMS app (like MSN) to enable live two-way contact via emergency '000' service
=14	Establish 'bush telegraph system' via SMS
17	Special hazard information line that is accessible via SMS

[†]Challenges marked in black in Tables 2-5 are based on the data from Phase 1 of the research that was reaffirmed in the Phase 2 FGDs. Those listed in red are additional challenges that community members added in the Phase 2 FGDs.

Table 4: Internet, TV, TTY, and Fax solutions

Rank	Internet, TV, TTY, and Fax solutions
1	All live TV news reports to have Auslan interpreting (that show full view of interpreter)
2	TV reports to have standardised & reliable captioning
3	Central website providing emergency information for all disasters and hazards (in simple English)
4	Increase access to emergency Information through the Internet (Auslan videos, captioned videos)
5	One central government emergency service website for people with disabilities
6	Greater use of social media through Internet (Facebook, Twitter)
7	Have direct emergency numbers for TTY and/or fax as an alternative to phone and internet services
8	24/7 specific TV news channel with constant captions and Auslan interpreters for Deaf
9	Google glasses to be used for relaying emergency information
10	Free or cheaper Internet Plans for Deaf people (half price discount)
11	Foxtel to have newsflashes with captions and Auslan
12	Compulsory captioning on all public TV and public transportation screens
13	Improve Internet speeds in rural areas
14	State based digital emergency notices through Tele-text and TV (such as Channel 46 NSW) and Twitter feeds
15	Improve TV reception in rural areas for clearer picture on TV
16	All TV news accessible online in Auslan and captions, etc.
17	Information 131500 transport line in pre-recorded video format to be made available online

Table 5: Capacity building and educational needs and actions

Rank	Capacity building and educational needs
1	Deaf awareness training for emergency services & public
2	Regular hazard workshops for Deaf people
3	Train emergency services on how to receive NRS calls from Deaf consumers
4	Emergency Services to train Deaf people to work as 'Deaf Liaison Officers'
5	Deaf Awareness Training for PM, CEO's and politicians, TV news presenters
6	Improve interpreter skills (via training) for emergency situations
7	Provide training for Deaf people (particularly seniors) on how to access information on the Internet
8	Deaf Society of NSW needs more staff and provide 24/7 emergency support
9	Train older generations on how to use smartphones and apps

Deaf Community members also understand the importance of having access to strong community networks in times of need. Social capital promotes reassurance, and stability in times of need (DFID, 2001, Munasinghe, 2007). Investing in the building of strong networks and improving social cohesion not only lowers vulnerability levels to natural hazards but also improves general well-being (Jäger et al., 2007). With this in mind, the Deaf Community have proposed a set of actions they feel will strengthen social networks, improve community cohesion, and increase institutional cooperation. Box 4 details seven key recommendations.

Box 4: Seven actions to improve community cohesion and institutional support

1. Organising a mentoring program within the Deaf Communities, whereby older community members such as former teachers and professional workers share their experiences with younger community members;
2. Support organisations and community groups to arrange more social activities in areas thought to have weaker community linkages to further increase social cohesion and strengthen networks. This is seen as particularly important in the Central West of NSW;
3. The Deaf Society of NSW to allocate more hours to Deaf-Blind services and provide guides for activities that Deaf-Blind people would like to be involved in;
4. Increase government funding for the Deaf Society of NSW to enable them to offer better services and support to the Deaf Community, particularly for those living in rural areas where support is most lacking;
5. Increase institutional learning among Deaf support organisations through a collective forum that is run on a regular basis. This forum would enable support organisations to learn from each other's successes;
6. Create a Deaf advisory committee to work with the government so they can better support the Deaf Community;
7. Strengthen institutional linkages and cooperation between the emergency services and Deaf support organisations, particularly the Deaf Society of NSW.

6 Improving emergency services support of Deaf people

Changes to existing emergency management strategies and processes cannot take place without having the appropriate structures (directives, policies and plans) in place to facilitate such a shift. In this section we therefore provide an overview of emergency management in Australia and the main policies and plans that shape emergency management strategies and actions in Australia generally and NSW specifically. We also review the current community programs and tools that NSW SES, NSW RFS and FR NSW have to support emergency and disaster preparedness for Deaf/deaf people and assess their effectiveness in informing and supporting the Deaf population. The outcomes of these are then used (in conjunction with the results from the *Deaf Community Needs Assessment* presented in Section 5) to formulate a series of recommendations that are designed to:

1. Increase Deaf people's accessibility to and provisions of emergency management information and programs;
2. Strengthen social capital within communities and build stronger institutional linkages;
3. Increase the capacity of NSW emergency service organisations to better support the Deaf Community in hazard situations and meet their identified needs; and
4. Facilitate greater Deaf Community engagement in and shared action on disaster and emergency preparedness.

6.1 Emergency management in NSW and Australia

A review of Australia's emergency management system, along with the policies and plans that support this system, reveals that the system is highly top-down and reflects the country's constitutional arrangements, whereby the States and Territories have the constitutional responsibility for protecting the lives and property of their citizens (Emergency Management Australia, 2009). The laws, policies, and subsequent emergency response plans used to direct emergency management in NSW are linked directly to two Commonwealth directives: the *Australian Emergency Management Arrangements* and the *Disaster Response Plan* (COMDISPLAN). These two directives provide the foundations upon which the NSW state government policies and plans (the main one being the *State Disaster Plan or Displan*) are based. But response and recovery arrangements are graduated from the bottom up, beginning with the individual affected by the hazard and moving up to the emergency services (ascending from the local, district, state and national levels) only when the capacity of the individual to respond is overwhelmed (NSW State Emergency Management Committee, 2003). Emergency management in Australia is also a shared responsibility between all stakeholders - the emergency services, non-government organisations, volunteers, community members, and the private sector (Emergency Management Australia, 2009). This integrated and collaborative approach is reinforced in the *National Strategy For Disaster Resilience*.

Australia's emergency management approach to servicing the specific needs of people with disabilities is to **provide special services** and arrangements for people with impairments or disabilities. The review of the existing emergency response and recovery/preparedness policies and plans that influence the actions and response capabilities of emergency service organisations confirms this. There are no specific arrangements for Deaf/deaf or hard-of-hearing people included in the existing plans and policies. However, the introduction of a special set of emergency management guidelines for people with disabilities (*Communicating with People with Disability: National Guidelines for Emergency Managers*) that align with both the *National Strategy for Disaster Resilience* and the *National Disability Strategy* does indicate a shift towards a more inclusionary model (Attorney General's Department, 2013a, Council of Australian Governments, 2011b, Council of Australian Governments, 2011a). The purpose of the national guidelines is to (i) help emergency managers and emergency services personnel across all levels of government and incident management better serve community members with disabilities, and (ii) promote mutual understanding and engagement between people with disability, carers, representative bodies, and emergency managers. This revised approach facilitates wide-spread participation, community empowerment and stresses the need for clear communication of risk and appropriate responses. A Quick Guide has also been developed to immediately aide emergency managers in identifying ways to address the communication needs of community members who have a disability at each stage of the Prevention, Preparedness, Response and Recovery (PPRR) cycle (see Attorney General's Department, 2013b).

6.2 NSW emergency services programs to support Deaf people

The NSW RFS, NSW SES and FR NSW offer more than 26 community programs aimed at educating the NSW population about the hazard risks that affect NSW and steps people need to take to better prepare for and respond before, during and after hazard events (see Calgaro et al., 2013b). A review of these programs clearly shows that the NSW emergency services are highly conscious of and committed to communicating effectively with and supporting the very diverse NSW public. The NSW RFS, NSW SES and FR NSW do not currently have any natural hazard preparedness programs that specifically cater to the needs of Deaf people (the SASS and SABRE programs are aimed at house fire prevention and preparedness). However, there are 19 programs, strategies, and communication tools that are either the 'Deaf-friendly' or have elements that may be 'Deaf' appropriate (see Calgaro et al., 2013b for more details on all programs). The most notable of these include:

- NSW SES's *FloodSafe* Program - the website has pictorial links to a dedicated Deaf and hearing impaired page that includes six Auslan videos with captions on flood preparedness, and there is a page dedicated to non-English speakers that includes pictorial preparedness instructions;
- The NSW RFS *Fires Near Me* smartphone and tablet app - smartphone apps enable access to written and pictorial material, which is most accessible for Deaf people; and
- The NSW RFS *Bushfire Survival Plan* smartphone and tablet app (being released in November 2013).

Box 5 identifies those programs that are deemed to have the greatest potential (judged on their current form) to be important natural hazard preparedness resources for deaf people following some alterations. Another initiative that is Deaf accessible is the national *Emergency Alert* system. *Emergency Alert* is the automated telephone warning system that is used by *emergency services in all states* to send voice messages to landlines and text messages to mobile phones within a defined area, about likely or actual emergencies such as fire, flood, or extreme weather events. The mobile version is an excellent way for Deaf people to access live information about all natural hazard threats in their area. For the mobile version, the system automatically sends a text message to all mobiles (using Telstra, Optus and Vodafone) with a registered service address within the warning area (Ministry of Police and Emergency Services, 2012).

Box 5: Promising natural hazard preparedness programs needing 'Deaf-friendly' adjustments

PROGRAMS LED BY FR NSW

FireEd -Deaf and hard-of-hearing children, from both oral and signing programs could greatly benefit from visual and hands on educational activities and seminars offered under this program. The dissemination of basic fire safety information to children is particularly important for children from families with non-English speaking backgrounds. However, questions of accessibility remain: (i) are these programs offered in deaf schools?; (ii) are mainstreamed deaf children provided with interpreters or communication support?; and (iii) does FR NSW know where deaf students are so that they can service their needs? If not, deaf students would not be able to participate.

SeniorEd- Deaf seniors - who are highly dependent on hearing children or others close to them to help them - are very keen to gain more independence through learning how to protect themselves. This program has the potential to provide deaf seniors with this knowledge. However, information delivery needs to be done face-to-face in Auslan. This could be achieved via community workshops offered in partnership with the Deaf Society of NSW offices.

CALD (partner with NSW RFS) - The CALD program matches well with deaf needs on two grounds: (i) set up to assist people from diverse cultural and linguistic backgrounds (Deaf people are a cultural and linguistic minority), people working with CALD have experience in running cross-cultural programs and activities; and (ii) it caters to people with limited or no English. However, programs and activities would need to be delivered in Auslan (via Auslan Youtube videos or through community workshops) and information would need to be highly visual.

Community Fire Units- Deaf people would like to have (and become) *Deaf Liaison Officers* - individuals trained by and working for the main emergency service organisations - who can act as knowledgeable liaisons between the Deaf Community and the emergency services. These officers could work closely with Community Fire Units. However, questions about deaf participation have been raised: (i) in light of Auslan interpreter shortages in rural areas, would it be possible to access interpreters for the training?; and (ii) who will cover the interpreter expenses?

PROGRAMS LED BY NSW RFS

Prepare.Act.Survive Campaign and Program- This campaign and program - including tools like the *Household Assessment Tool*, *Prepare a Bushfire Survival Plan*, *Fire Danger Ratings*, *Bush Fire Alert Levels System*- have all the information one needs to prepare for a bushfire. However, the language used needs to be simplified and the information needs to be presented in a more visual way (pictures and videos). Auslan videos also need to be added to the *Multilingual Safety Information* webpage (http://www.rfs.nsw.gov.au/fact_sheets/non_english.cfm).

Bushfire Awareness Program- This program contains the information needed to better educate deaf people on hazards, what disasters are, and how people can better prepare themselves. However, the presentation of the information is heavily text-based and the language is too advanced for people with limited English or low literacy levels to understand. Delivering this material via a Natural Hazards workshops (undertaken in Auslan) would also be highly beneficial for Deaf people.

AIDER Program- This program would be very beneficial to seniors and those with disabilities but it is not well publicised within the Deaf Community. So, many people do not know about it but there is great interest in it.

Hotspots Program - This would greatly benefit deaf people in rural areas but questions have been raised regarding the acceptance of Deaf people by hearing neighbours and problems in sourcing Auslan interpreters in rural areas to enable Deaf people to participate.

Community Fire Units- the NSW RFS CFU program has great potential (see comments under FR NSW above). The biggest problem is that there is *no* public information available on it.

NSW SES PROGRAMS

StormSafe Program - Mirroring the features of the *FloodSafe* program, *StormSafe's* accessibility for deaf people is heightened by its home webpage having clear pictorial links to separate webpages for deaf people and non-English users on its website. Its non-English speakers page also contains pictorial safety messages (in cartoon form) advising people what to do when faced with severe storms. Missing, however, are the Auslan videos (with captions) on the Deaf and hearing impaired page. These need to be added to make the information more deaf-friendly.

TsunamiSafe Program - Being the least developed of the three *Safe* programs, the *TsunamiSafe* program does have the potential to be a valuable resource if the *FloodSafe* model and tools were adopted. Currently, the *TsunamiSafe* website is too text-based and the language is too advanced for many deaf people.

All Hazards Emergency Kit - The kit could be very useful in helping Deaf Community members create their own emergency kit. The Emergency Kit Magnet is a great way to remind people to do this. To improve accessibility, two alterations are suggested. The kit is highly text-based but the language is simple enough for people to understand. The inclusion of Auslan videos and/or a pictorial brochure would work best to reach out to all community members (Deaf or hearing) with varying levels of English comprehension skills.

6.3 Recommendations for improving communication and delivery of preparedness information

Our evaluation of the emergency services communication materials and strategies in meeting the needs of Deaf people reveals that considerable communication innovation and capacities already exists within the emergency services. This creates a solid platform for producing communication materials and strategies that meet the needs of Deaf people whilst taking full advantage of initiatives that already exist. To this end, we have identified 17 recommendations to improve their accessibility to Deaf people (Box 6). Key recommendations include:

1. Including a specific Deaf/deaf and hard-of-hearing webpage on emergency services websites (using the NSW SES *FloodSafe* webpage as a model) that includes clear visual icons, Auslan videos with captions, PDF brochures containing visual cues, and Deaf-accessible contact details;
2. ***Shift emphasis from the written word and text to visual cues (symbols, pictures, cartoons, common icons or photos) paired with basic English text to increase understanding and accessibility for a wide range of people including Deaf people and those whose first language is not English;***
3. Increase the use of both Auslan videos (with captions) and pictorial formats to better communicate with Deaf people. A balance of both formats - Auslan videos and pictorial formats - would be best but if finances are lacking pictorial formats are a good (and in some cases a better) substitute as they are accessible to all; and
4. Produce an 'all hazards' DVD (based on the model used by Deaf Services Queensland's *Be prepared for natural disasters* DVD), disseminate this through public libraries, the emergency services and established Deaf/deaf and hard-of-hearing networks and support organisations. A joint emergency services road show run in partnership with the Deaf Society of NSW could also be used to promote the DVD.

Box 6: Recommendations for increasing accessibility to current emergency services programs

WEBSITE NAVIGATION

- Include one website section specifically for deaf and hard-of-hearing people that includes different links to specific information that is relevant to this group. This includes cross-links on the NSW SES, NSW RFS and FR NSW pages to each other's deaf and hard-of-hearing pages
- Include clear pictorial links to deaf-relevant content on the homepages of websites
- Group material in a way that requires users to use fewer hyperlinks to get access to related material
- The Deaf Society of NSW to have a direct web link on their homepage that links Deaf users to all relevant NSW state emergency service organisations to make it easier for Deaf people to locate emergency and natural hazard information

USAGE OF MULTIMEDIA TOOLS

- Use Auslan videos with captions on all emergency service organization websites to explain what people need to do in the event of different hazards
- Add more visual examples of key points or instructions to video clips to help deaf people quickly grasp the topic of discussion
- Shorten the length of video clips (ideally to no more than a maximum length 2 minutes)
- Create an 'all hazards' DVD that presents what natural hazards and natural disasters are, which natural hazards affect NSW and what people should do to better prepare themselves and respond to future events (including who to contact and how to contact them). Information needs to be presented in Auslan with captions (using basic English) and accompanied by corresponding pictures and visual examples to ensure accessibility for a wide range of Deaf/deaf and hard-of-hearing people. These DVDs should be distributed through public libraries, the emergency services and established Deaf/deaf and hard-of-hearing networks and support organisations

USAGE OF TEXT, VISUAL CUES AND LANGUAGE

- Use visual cues (pictures, common or universal icons, photos) and pictorial formats in emergency and hazard preparedness material as much as possible
- Use visual cues (particularly icons) consistently across all emergency and disaster preparedness material produced by the NSW SES, NSW RFS and FR NSW to avoid confusion for Deaf people, an action point that requires co-ordination across the three organisations and community consultation
- Add numbering or clear steps to text boxes and/or pictorial formats to increase understanding
- When using text, pair simple language (basic English) with visual cues as much as possible. Include pictures of the resources people need to be better prepared for natural hazards, use green checks (✓) and red "x" marks (✗) to demonstrate good practices and bad practice and add arrows to help deaf people understand connections between key instructions and points
- Create mini 'fold-out' versions of larger preparedness documents (e.g. the *Prepare.Act.Survive Survival Plan* Booklet) that illustrates the plan in a numerical or step-by-step way. The main booklet can be provided for those who have capability of understanding the language use whilst those who are Deaf, less literate, or non-English users can use the mini booklet

REFERENCING TO NON VOICED-BASED EMERGENCY CONTACT NUMBERS

- Reference all deaf accessible emergency contact mediums (and corresponding numbers, email addresses, NRS Skype usernames) on websites and printed/printable material to enable deaf people to choose which medium they prefer i.e.:
 - by TTY - dial 106
 - by internet relay and ask for Triple Zero (000)
 - bySMS relay – text 0423 677 767
 - by video relay – login to Skype and contact NRS
- Make sure that any references to the 106 emergency contact number is solely a TTY number and not a SMS based service
- Create a new icon for the new SMS emergency number and add this icon to all emergency services websites and disaster preparedness material where appropriate i.e. the new icon should include a symbol of a mobile phone accompanied by the term "000 SMS EMERGENCY CALL".
- Produce a version of the popular NSW SES 132 500 magnet that includes the new emergency SMS number that deaf people can contact

6.4 Recommendations for facilitating shared responsibility in emergency management in NSW

“I also would like to see a Deaf person work or be involved with the SES. I would if given a chance”(Central West resident).

The overarching aim of this research was to identify ways (strategies, materials and tools) to increase the resilience of Deaf people by:(i) ascertaining their needs and preparedness challenges,(ii) examining the accessibility of existing emergency services programs and communication tools from a Deaf perspective, and (iii) proposing a set of tools, activities and procedures to improve hazard preparedness for Deaf people. We have fulfilled these requirements in Sections 5, 6.2 and 6.3. However, this research has also identified a deeper issue that is affecting the Deaf Community’s ability to effectively respond to natural hazards. As argued in Section 5.1, there is much confusion amongst Deaf people concerning the responsibilities that emergency service organisations have in supporting the community. Residents believe that the onus of responsibility for preparedness actions and ensuring their safety during live hazard events falls more to the emergency services and local councils than on themselves, indicating a fundamental mismatch between perceived responsibilities by community members and those stipulated by Australian emergency management mandates(Calgaro et al., 2013a). This is not a Deaf-specific problem; it is mirrored in the wider NSW and Australian population (Bohensky and Leitch, 2013, Box, 2013, Department of Premier and Cabinet, 2011, Leigh, 2006, Whittaker and Handmer, 2010).

This finding clearly indicates that Australia’s ‘shared responsibility’ approach to emergency management outlined in Section 6.1 is not well understood by the Deaf Community in NSW or the general public. People affected by natural hazards are never simply passive victims; they are active agents who make choices based on multiple factors including risk perceptions, expectations, personal experiences, and cultural norms(Fordham, 1999, McLaughlin and Dietz, 2008). However, this message is simply not getting through to the NSW public. This consequent mismatch in expectations not only causes misplaced community frustration but also leaves Deaf people underprepared and highly vulnerable to future hazard events.

There is therefore a need for shifting the public’s (conscious or unconscious) perceptions from being wedded to a state of dependence and reliance on emergency services to one of participation and empowerment. This shift in emphasis aligns strongly with both the *National Strategy For Disaster Resilience*(Council of Australian Governments, 2011b) and Articles 9 and

11[‡]of the United Nations' *Convention on the Rights of Persons with Disabilities* (UNCRPD) that Australia is a signatory of (Hans and Mohanty, 2006, United Nations Secretariat for the Convention on the Rights of Persons with Disabilities, 2006). It is also supported by the lessons learnt from the international disaster response experiences (outlined in Section 4.3) i.e. **Deaf people need to take ownership of their own preparedness and safety** to the degree allowed by their disability (National Council on Disability, 2005). It is clear from the Deaf Community Needs Assessment results that **Deaf people want to be more active and involved in emergency management practices** and are looking for opportunities to do this (see Sections 5.3 and 5.4). Consequently, our final set of recommendations is aimed at facilitating shared responsibility in emergency management. These are presented in Box 7.

6.5 Emergency services capacities to implement Deaf-accessible programs

The creation and implementation of new and adjusted emergency and disaster risk management protocols, strategies, and tools cannot be done effectively without determining whether the institutions responsible for implementation have the resources (social, human, economic capital) they need to successfully operationalize changes (Tan-Mullins et al., 2007). The emergency services in NSW are therefore charged with the difficult task of balancing the priorities of multiple groups and making judgements on how best to use the finite resources they have to service the collective needs of a very diverse population.

FR NSW was unable to undertake the planned Institutional Capacity Assessment within the timeframe of the project. Instead, a self-assessment will be planned at a later date. The NSW RFS and NSW SES did undertake a preliminary[§] self-evaluation of their capacity to (i) action suggested changes to their current program and (ii) implement the range of resilience building strategies that the NSW Deaf Community proposed as part of the Deaf Community Needs Assessment.

[‡] Article 9 of the United Nations' *Convention on the Rights of Persons with Disabilities* (UNCRPD) stipulates that signatories (which includes Australia) shall "take appropriate measures to ensure to persons with disabilities access, on an equal basis with others...to information and communications... [including] ...emergency services" (Hans & Mohanty, 2006). Article 11 of the UNCRPD states that signatories are required to "take...all necessary measures to ensure the protection and safety of persons with disabilities in situations of risk" (United Nations Secretariat for the Convention on the Rights of Persons With Disabilities, 2006).

[§] The NSW RFS and NSW SES were also prevented from undertaking a full Institutional Capacity Assessment within the timeframes of this project. However, they have provided a very useful preliminary evaluation of the strategies and recommendations. The inability of the emergency service partner organisations to undertake full Institutional Capacity Assessments within the project's designated timeframe also made it impossible for us to devise a communication strategy that matches the needs of Deaf people in NSW in partnership with the all partner organisations as originally planned. Instead, we offer a series of recommendations that form the basis for future discussions between the emergency services and the Deaf Society of NSW as the main Deaf service organisation in NSW.

Box 7: Recommendations for facilitating shared responsibility in emergency management

IMPROVING HAZARD AWARENESS AND PREPAREDNESS FOR DEAF COMMUNITY MEMBERS

- **Regular natural hazard workshops for Deaf people** (presented in Auslan) to be provided throughout NSW by the emergency services (NSW RFS, NSW SES, FR NSW - working together) with support from the Deaf Society of NSW and Deaf Liaison Officers (see below). Content to include: identification of natural hazard risk in NSW, the roles and responsibilities of emergency service organisations (within the context of the Australia's emergency management policies and practices), and the steps people need to take to better prepare and respond to future hazard events (see Calgaro et al., 2013a for more details).

INCREASING DEAF AWARENESS AMONG EMERGENCY SERVICES STAFF AND SUPPORT PERSONNEL

- **Regular Deaf Awareness Training** for emergency services personnel, first-responders and volunteers working on the ground during a hazard event, government officers with emergency management response responsibilities and the general public. To be provided by Deaf Society of NSW in partnerships with emergency services (NSW RFS, NSW SES, FR NSW - working together) and Deaf Liaison Officers (see Calgaro et al., 2013a for more details).

BUILDING RAPPORT AND TRUST BETWEEN DEAF COMMUNITY MEMBERS AND EMERGENCY SERVICES

- **Emergency services to train and appoint a Deaf Liaison Officer** to work in partnership with emergency services and the Deaf Society of NSW to improve Deaf people's access to and comprehension of emergency and disaster preparedness information and resources. This person would be a trusted and culturally sensitive liaison that could successfully link the Deaf Community and the emergency services and build much needed trust, mutual understanding and rapport. This position could be for a shared officer (either between NSW RFS, NSW SES and FR NSW only or between all three ESOs and the Deaf Society of NSW. For specifics on possible roles see Calgaro et al. (2013a);
- **Create a Deaf advisory committee** to work with the emergency services (together or separately) and government on ways to increase disaster preparedness and resilience to natural hazard events and to discuss issues as they arise. Emergency services personnel could meet with this committee twice a year, for example, before and after bush fire season.

BUILDING INSTITUTIONAL PARTNERSHIPS AND CAPACITY

- **Create a formal link between the Deaf Society of NSW and the emergency service organisations** (NSW RFS NSW SES and FR NSW) to build and strengthen institutional partnerships and facilitate collaborative initiatives designed to empower Deaf Community members to be active agents in their own preparedness. Possible roles for the Deaf Society of NSW could include:
 - Being a conduit between NSW emergency services and the Deaf Community to facilitate appropriate channels of communication using established networks and client lists;
 - Hosting a webpage on their website (or a link to either an external 'all hazards' preparedness website or individual ESO websites) that provides Deaf people with information and advice in Deaf-accessible formats on: how to prepare and respond to different hazard events; who to contact to get access to resources people need during and after hazard events; and providing contact details of the Deaf Liaison Officer (if appointed);
 - Work with the emergency services to ensure that emergency services and first responders have the resources they need (e.g. access to interpreters or Deaf counsellors if needed) to properly support Deaf people during and after live events.
- **Provision of more Auslan interpreters during emergency events.** This could be a shared responsibility between the NSW emergency services and the Deaf Society of NSW. However, further discussions are needed to explore how shared arrangements would work and funding sources;
- **Improve Auslan interpreter skills for emergency situations** via training undertaken by the emergency service organisations (NSW RFS NSW SES and FR NSW) in partnership with Sign Language Communications (SLC) to help increase the effectiveness of communication during live events.

Both organisations are largely supportive of the recommendations aimed at increasing Deaf people's accessibility to their current community programs and communication materials outlined in Section 6.3. However, actioning these changes will be subject to available resources - see Calgaro et al. (2013b) for details. A review of the risk awareness and preparedness strategies put forward by the Deaf Community (Section 5.4) reveals that many of these fall outside the jurisdictions (and therefore control) of the NSW emergency service organisations and the Deaf Society of NSW. Accordingly, Table 6 lists the solutions that are the responsibility of the emergency services, the Ministry of Police and Emergency Services and the Deaf Society of NSW as the Deaf Community representative body. These solutions are the focus of this review. Some of the suggestions that are listed in Table 6 are either already in place (either fully or in part) or are currently believed to be in the planning phase (highlighted in ***bold italics*** in Table 6). There is, however, scope to implement some of the other strategies listed in Table 6.

The strategies that have support are summarised below:

- **Inclusion of a specific Deaf and hard-of-hearing webpage on emergency services homepages:** The NSW SES's *FloodSafe* website already has a **dedicated page**. Creating a Deaf and hard-of-hearing webpage for the *TsunamiSafe* program are options currently under consideration. The NSW RFS are currently redesigning their website. They are supportive of making their website more accessible to people with a range of disabilities and special needs and will take our recommendations under advisement;
- **Need for plain text with pictures for written material:** The NSW RFS support a shift from text toward a greater use of visual cues to increase understanding and accessibility of material presented in their written material;
- **Increase access to emergency information through the Internet (Auslan videos, captioned videos):** The NSW SES's *FloodSafe* Program already features Auslan videos with captions but they are considering adding Auslan video content to their *StormSafe* and *TsunamiSafe* program webpages. The NSW RFS also supports greater usage of Auslan videos and pictorial formats to improve accessibility;
- **Appointment of a Deaf Liaison Officer:** This is well-supported by the NSW SES. Having a Deaf person working with emergency services in some capacity would help facilitate active Deaf Community engagement in emergency management. The RFS are supportive in principle but are not currently in a position to host a Deaf Liaison Officer;
- **Deaf support organisations to act as intermediaries between emergency services and the Deaf Community:** The emergency services (and Deaf Community) strongly support the strengthening of institutional linkages and cooperation between the emergency services and Deaf support organisations (particularly the Deaf Society of NSW). Lessons taken from the past experiences of Deaf people in coping with hazards suggest that Deaf/deaf support organisations are well placed to help facilitate greater access to the resources Deaf people need to cope with the impacts of the events and recover afterwards.

Table 6: Solutions for increasing support and information accessibility for Deaf people

Improving access to information	Response organisations
More visual hazard warning signs in public areas	NSW RFS, NSW SES, FR NSW
Central register system administered by emergency services/ councils where disabled people can register contact details& needs	NSW RFS, NSW SES, FR NSW
More interpreters (Auslan& deaf-blind) during emergencies	Shared between ESOs and Deaf Society of NSW
<i>Door-to-door updates by the emergency services</i> or Deaf Liaison Officers during hazard events	<i>NSW RFS, NSW SES, FR NSW</i>
<i>Access to GPS system that tracks weather conditions, road blocks and provides alerts on approaching natural disasters</i>	<i>NSW RFS, NSW SES, FR NSW</i>
Need for plain text with pictures for written material	NSW RFS, NSW SES, FR NSW
Regular newsletters and pamphlets on hazard risk, preparedness, and response from councils/emergency services or Centrelink	NSW RFS, NSW SES, FR NSW
Deaf support organisations to disseminate natural hazard and emergency information	Deaf Society of NSW
Visual hazard signs that state “if you see a bushfire or floods, please call this #” - would like the same in SMS format	NSW RFS, NSW SES, FR NSW
Mobile and landline telecommunication solutions	Response organisations
Establish a direct SMS “000” emergency contact number (no 3rd party - NRS or VRS)	Federal government
<i>Receive SMS Emergency Warning Alerts from emergency services</i>	<i>NSW RFS, NSW SES, FR NSW</i>
Video Relay Service (VRS) to contact Emergency Services	NSW RFS, NSW SES, FR NSW
<i>Smartphone apps like Silent Tweets, RFS NSW Fires Near Me app</i>	<i>NSW RFS, NSW SES, FR NSW</i>
Alert icon App that knows where you are if emergency situations	NSW RFS, NSW SES, FR NSW
<i>Central website providing emergency information for all disasters and hazards (in simple, plain English)</i>	<i>Ministry for Police & Emergency Services</i>
Increase access to emergency Information through the Internet (Auslan videos, captioned videos)	NSW RFS, NSW SES, FR NSW
One central government emergency service website for people with disabilities	Ministry for Police & Emergency Services in partnership with NSW RFS, NSW SES, FR NSW
Use of social media through Internet (Facebook, Twitter)	NSW RFS, NSW SES, FR NSW
State based digital emergency notices through Tele-text and TV (such as Channel 46 NSW) and twitter feeds	Ministry for Police & Emergency Services (?)
Capacity building and educational needs	Response organisations
Deaf Awareness Training for emergency services & public	Deaf Society of NSW in partnership with all ESOs
Regular hazard workshops for Deaf people	Deaf Society of NSW in partnership with all ESOs
Train emergency services on how to receive NRS calls from Deaf consumers	Deaf Society of NSW in partnership with all ESOs
Emergency Services to train Deaf people to work as ‘Deaf Liaison Officers’	All ESOs in partnership with the Deaf Society of NSW
Improve interpreter skills (via training) for emergency situations	Sign Language Communications (SLC) in partnership with all ESOs
Provide training for deaf people (particularly seniors) on how to access information on the Internet	Deaf Society of NSW with community organisations
Deaf Society of NSW to provide 24/7 emergency support	Deaf Society of NSW

7 Conclusion

In this report we have presented the main findings of the project in accordance with our 4-step approach. First, we provided the foundational knowledge needed to formulate effective resilience building strategies. Specifically, we:

- Identified the types of natural hazards that occur in NSW and describes the characteristics of the Deaf Community in NSW (*who* is at risk and to *what*);
- Reviewed the experiences of Deaf people around the world and provided an overview of the challenges that Deaf/deaf people, on the one hand, face in preparing and responding to hazardous events as well as those that emergency service organisations have in effectively supporting deaf people prior, during, and after an emergency or disaster event (thereby providing a broader context for more specific enquires); and
- Presented a set of general recommendations aimed at improving disaster preparedness and response levels amongst the Deaf/deaf and hard-of-hearing populace from the lessons gained from the past experiences of Deaf people around the world.

Second, we identified the specific needs and challenges that the NSW Deaf Community face in responding to natural hazard events. This is a first as we have very little knowledge on the experiences Deaf people in Australia have had in responding to hazards in the past. This includes:

- How Deaf/deaf people in NSW perceive risk;
- The information sources they use to inform themselves of possible risks;
- The sources and type of information they rely on for directives, the networks (personal or community-based) they turn to for assistance when their individual coping capacities are overwhelmed and their capacity to recover following the emergency or disaster event; and
- The actions Deaf people take to prepare themselves prior to the onset of hazardous events, the actions people take in response to natural hazards and the challenges they face.

Most, importantly, we presented a range of solutions Deaf Community members believe will increase their risk awareness and help them better prepare and respond to future natural hazards.

Third, we looked at the capacity of the NSW emergency services to support and meet the identified needs of Deaf Community members in emergency and disaster situations. This began with an overview of emergency management in Australia and NSW followed by an examination of the effectiveness of the current programs and tools of the NSW RFS, NSW SES and FR NSW in delivering key preparedness and response messages and instructions to the Deaf Community.

Drawing upon the collective findings of the Synthesis Review (Step 1), the Deaf Community Needs Assessment (Step 2), and the Emergency Services Capacity Assessment (Step 3), we presented a series of recommendations (Step 4) that are designed to:

1. Increase Deaf people's accessibility to and provisions of emergency management information and programs;
2. Strengthen social capital within communities and build stronger institutional linkages;
3. Increase the capacity of NSW emergency service organisations to better support the Deaf Community in hazard situations and meet their identified needs; and
4. Facilitate greater Deaf Community engagement in and shared action on disaster and emergency preparedness.

In doing so, we have met the main aims of this project.

That said, we would like to stress that the recommendations made in this report and the dialogue with the partner organisations that contributed to the formation of these recommendations only marks the start of a longer process. Building community resilience to natural hazards requires mutual understanding, trust, strong cooperative partnerships and sustained engagement between the emergency services, Deaf support organisations and Deaf Community members. We hope that the information here provides a solid platform for future discussions and progress in generating greater cross-cultural understanding and advancing resilience within the Deaf Community.

However, there are some wider issues that require further investigation:

1. Emergency services need to know where Deaf people live and what proportion of the Deaf population live in high-risk areas. However, as noted in Section 3.2, reliable information on the Deaf population is hard to obtain due, in part, to the types of questions that are asked in the Australian Bureau of Statistics census. Having a central register system (administered by emergency services or local councils) where disabled people can register contact details and their specific needs (see Table 6) could assist in locating Deaf people and help inform emergency services of what resources are needed to support these populations and where these resources are needed. However, this type of system is difficult to maintain and could increase Deaf people's vulnerability if the details are not kept up-to-date by users (see Calgaro et al., 2013b for more details);
2. Emergency services are charged with the responsibility of supporting a very diverse range of people. Consequently, they face the difficult task of deciding how best to use finite resources to meet these needs of diverse populations. Our mandate for this project was to identify ways to increase the resilience of Deaf people to natural hazard events. We have made efforts to recommend ways that current emergency services programs and tools can be changed to benefit a wider audience (Section 6.3) in recognition of this issue but we acknowledge that more needs to be done on balancing these competing and sometimes conflicting needs. We therefore recommend the undertaking of more research (that builds on our findings) to:

- a. Ascertain how the communication and support needs of the Deaf Community interface with other minority groups (e.g. people who hard-of-hearing, people that speak a language other than English, those with low-literacy levels, people with limited or no sight, people who are colour blind); and
- b. Identify commonalities and differences between the needs of these different groups; and
- c. Examine the capacity of emergency services to meet these diverse needs based on existing resources and internal structures and priorities that are in place (the latter being very important as these can either hinder or facilitate action); and
- d. Devise communication and community engagement strategies and tools that both service these diverse needs and facilitate greater community ownership of their own preparedness and response capabilities to future hazards.

With thanks:

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Appendix 1



PROJECT WORK PLAN

TITLE: Increasing the resilience of the Deaf Community in NSW to natural hazards and disasters

PROJECT PARTNERS: The Deaf Society of NSW (DSNSW), the NSW State Emergency Service (NSW SES), the NSW Rural Fire Service (NSWRFS), the Fire Rescue NSW (FR NSW) and the ATNHRL, UNSW

In order to successfully deliver this project, a detailed work plan is required. This plan takes account of the stated aims and objectives of the proposal and the available timeline and budget. The aims and objectives of the project are provided followed by 'step-by-step' work tasks, description of methods, reference to who completes the work, the milestones and the deliverables.

AIMS:

- 1 - increase the resilience of the Deaf Community to future natural hazards and disasters via improved access to and provision of emergency management information; and
- 2 – increase the effective resources of NSW emergency service organisations enabling them to deliver their core business (to the Deaf Community) and to improve the deaf awareness for staff and professional officers within those organisations.

The aims will be achieved via the successful delivery of the following objectives:

OBJECTIVES:

- 1 – to undertake consultation workshops and to conduct face-to-face interviews with representative members (and stakeholders) of the Deaf Community to determine:
 - (a) present awareness of the Deaf Community to natural hazard and disaster risk in NSW;
 - (b) to identify the current sources of information used by the Deaf Community to help prepare for emergencies and to respond appropriately in hazard/disaster situations;
 - (c) to investigate the preferred forms of 'communication' that will meet the needs of the Deaf Community during live emergency situations in the future; and
 - (d) to analyse existing capabilities of the NSW emergency service organisations (specifically, the NSW SES, the NSW RFS and FR NSW) to deliver risk information and warning messages to deaf people across NSW.

(a) to (d) constitute the fundamental research questions of this project.

2 – to use the results generated from Objective 1 to devise a range of information communication sources/materials and strategies to meet the needs of deaf people in NSW;

3 – to trial and test various communication and information sources for selected (high probability) hazard scenarios in NSW with deaf people in NSW; and

4 – to assist the NSW SES, the NSW RFS and the FR NSW devise and implement a communication strategy to specifically cater for the needs of deaf people in NSW.

Step-by-step Tasks, Project Timeframe, Methods, Milestones and Deliverables:

In order to successfully deliver the project, it is divided into a sequence of steps with associated 'Tasks'. The tasks will be completed within specific timeframes. Appropriate methods and tools will be applied to the relevant steps/tasks and particular deliverables will be produced at specific milestones in the project. These are detailed in the text that follows and graphically illustrated in the accompanying Table.

1 – Establishment of an Advisory Committee (Co-Chaired by a representative of the NSW SES and the Deaf Society of NSW) to guide the project. The committee should be manageable in size and comprise appropriate representatives of all relevant stakeholder organisations. The Committee should be able to adequately meet on a regular basis (e.g., monthly) and guide the research to keep the project on track and ensure it meets its objectives;

2 – Appointment of a suitably qualified Research Fellow with experience in mixed methods, quantitative and qualitative social science and human geography research using questionnaire survey instruments, face-to-face interviews (in-depth, open and closed questions, semi-structured), leading workshops/forums and with appropriate statistical and other (e.g., qualitative coding software – Nvivo, Chi squared, t-test, parametric and non-parametric statistics etc) analytical techniques. A strong knowledge of social processes, human geography, hazard, risk and vulnerability sciences and the principles of emergency risk management are fundamental requirements. Knowledge of Auslan would be a distinct advantage (or capacity/willingness to learn). The ideal candidate will have a PhD in a relevant discipline field. The UNSW Enterprise Agreement conditions state that for such a position, appointment at Level A, step 6 is most appropriate. This salary scale (and its Year 2 incremental rise to step 7 (plus planned 6% pay rise for that step)) are reflected in the budget requested. Hereafter, this person will be referred to as the "Research Fellow (RF)";

3 – RF to undertake a detailed background literature review to examine existing literature and policy context and official protocols in relation to communicating risk management information to the Deaf Community. This should focus on both the domestic situation in Australia (with a particular focus on NSW and other State emergency service organisations) and internationally (e.g., US weather service etc). This will provide a benchmark of existing ‘best practice’;

4 – RF to develop appropriate social survey questionnaires (open and closed question for quantitative and qualitative analyses) for interviewing participants about existing hazard and risk awareness in NSW and sources of risk management information. Questionnaire development (and testing/trialling) to take account of latest best practice and knowledge of risk management social surveying (e.g., Bird, 2009). Project to consider use of on-line free questionnaire survey tools (e.g., Survey Monkey) and hosted on the NSW SES and DSNSW web sites to increase total number of surveys. The interviewing will take place in two forms: (1) community consultation forums (multiple persons participating). There will be eight such community forums (3 in the Sydney metro region) and 5 in the regions and rural areas. The exact locations of these community forums will be guided by the distribution of existing Deaf Society of NSW regional areas (together with their local networks) and the NSW SES regions. This will ensure efficiency and congruence between Deaf Society of NSW offices and NSW SES regions/units. From the forum participants, *circa* 200 people will be asked to participate in detailed one-on-one, face-to-face interviews with the RF to obtain more detailed qualitative knowledge relevant for supporting evidence based decision making and policy development and implementation. The results of the forum and face-to-face interviews will be added to the results of surveys completing using the on-line Survey Monkey questionnaire increasing the overall number of participants consulted;

5 – RF (together with Auslan interpreters) and a Deaf Society of NSW Deaf Facilitator to undertake community consultation forums and face-to-face interviews with deaf participants. Results to be collated, coded and analysed using quantitative (statistical) techniques for pattern identification and qualitative techniques (e.g., Nvivo) to provide rich, contextual information on hazard awareness, information needs, current information access protocols and preferred forms of communication;

6 – RF to prepare document/report detailing preferred communication types/styles and protocols (preferred by the Deaf Community) for receiving official warnings and other risk management information during emergencies;

7 – RF in partnership with emergency service organisations, to undertake analysis of existing capabilities of those organisations to communicate with members of the Deaf Community during crises and emergencies. This will include policy and protocol analysis, skills audits and alike to identify current practices and gaps in capacity;

8 – Develop and trial various emergency communication strategies for selected hazard/disaster scenarios.

Timeframe of project, work tasks, methods and management

Work tasks	Timeframe					Comments & Notes	Deliverables & Milestones
	0 – 6 months	6 – 12 months	12 – 18 months	18 – 24 months	24 months onwards		
Project Management						Management to occur throughout project supported by Research and Finance Managers at the ATRC-NHRL, UNSW. All project partners to be consulted on major project decisions throughout	Project to be completed on time and to budget
Establishment of project Advisory Committee						All project partners have already committed to membership of this Advisory Committee. Should be Co-Chaired by NSW SES and Deaf Society of NSW	Project to be completed on time and to budget
Appointment of suitably qualified Research Fellow						As soon as possible after project funds awarded. (At UNSW Level A, step 6)	To lead the research and to develop products, reports, publications and materials
Synthesis of previous work (including literature review, policy and practice synthesis)						Standard literature review of available materials and previous work – to also take account of NSW SES, NSW RFS and FR NSW policies	Deliverable = “Synthesis Report” Milestone 1 = @ 6 months
Develop, test and implement questionnaire survey via consultation forums and face-to-face interviews (plus analysis of results)						This achieves Objective 1a, b & 1c	Deliverable = “Questionnaire survey and question bank” Milestone 2 = @ 6-9 months Deliverable = “Preliminary results Report” Milestone 3 = @ 12 months
Undertake emergency service organisation capability assessment in relation to communication with Deaf Community						In reality, this task to be completed by about 15 months in to project and commences soon after RF appointed This achieves Objective 1d	Deliverable = “Capability Report” (confidential for benefit of sponsoring organisations) Milestone 4 = @ 15 months
Develop, trial and evaluate alternative communication materials and strategies						This achieves Objectives 2 & 3	Deliverable = “Hazard scenarios & communication materials” Milestone 5 = @ 18 months
Develop emergency service organisation communication protocols, materials and strategies (e.g., with NSW SES etc)						This achieves Objective 4	Deliverable = “Strategies & Protocols” Milestone 6 = @ 24 months
Project write-up							Deliverable = “Final Report” Milestone 7 = @ 24 months
Results dissemination and communication to the wider community (incl. all emergency service organisations in NSW and Australia), the Deaf Community, the wider community)						Project successfully completed	Deliverables = “Knowledge notes, Communication Briefs, Newsletters, journal publications etc” Milestone 8 = as appropriate