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CONTENTS

ABSTRACT.....	IV
KEYWORDS	IV
1.0 INTRODUCTION	5
2.0 METHOD	5
2.1 Questionnaire	5
2.2 Selection of communities	6
2.3 Questionnaire delivery	8
3.0 RESULTS.....	11
3.1 Return rates	11
4.0 REPRESENTATIVENESS OF SAMPLE	11
4.1 Home ownership	11
4.2 Number of years living in the community	12
4.3 General demographics	14
5.0 PERCEPTIONS OF FLOOD RISK.....	16
5.1 The most likely natural disaster that could affect your community	16
5.2 Had the respondent been affected by any previous events.....	17
5.3 The extent to which respondents were affected by various events	19
5.4 When respondents thought certain disasters were next likely to affect their community	20
5.5 The last time a respondent's community was flooded.	21
5.6 The last time a respondent's house was flooded.....	22
6.0 PREPAREDNESS FOR FLOODING	23
6.1 Current preparations	23
6.2 Respondents' beliefs about preparing for flooding	24
6.3 Critical awareness	25
6.4 Intention to seek information and become involved with a local group.....	26
6.5 Flood protection provided by a levee	27
6.6 Flood insurance	28
7.0 FLOOD WARNINGS	29
7.1 Elements making up the public flood warning system	29
7.2 What respondents would do on hearing a flood warning	30
7.3 The number that respondents would call for help in a flood	31
7.4 The organisation respondents would contact for information in a flood.....	32
7.5 Evacuation during a flood	32
7.6 Flooded areas of road.....	33
8.0 PUBLIC EDUCATION.....	36
8.1 Had respondents seen any flood information for their local river.....	36
8.2 Places information was received from about preparing for floods	37
8.3 Whether respondents had asked any particular people, groups or organisations for information on how to get ready for floods	38
8.4 Preferences for getting information about preparing for floods.....	38
8.5 Preferences for receiving information about current flooding	39
8.6 Responsibility for flooding	40
8.7 Belief in preparing for flooding	40

9.0	HAZARD COGNITIONS – THE EXTENT TO WHICH PEOPLE THINK ABOUT AND DISCUSS HAZARDS	41
9.1	Barriers to flood preparation	41
9.2	Outcome expectancy and level of concern	41
9.3	Sense of community	42
9.4	Self efficacy	43
10.0	STRUCTURAL INFORMATION ABOUT RESPONDENTS' PROPERTY	45
10.1	Details about building structure	45
11.0	CONCLUSIONS	46
	REFERENCES.....	49
	ACKNOWLEDGEMENTS.....	50

FIGURES

Figure 1	Survey delivery areas for Grafton with associated census data from relevant Collector Districts.	8
Figure 1a	Survey delivery areas for Ulmarra (near Grafton) with associated census data from relevant Collector Districts.	9
Figure 2	Survey delivery areas for Narrabri with associated census data from relevant Collector Districts.	9
Figure 3	Survey delivery areas for Albury with associated census data from relevant Collector Districts.	10
Figure 4	Survey delivery areas for Maitland with associated census data from relevant Collector Districts.	10
Figure 5	The number of years residents had lived in their community.	12
Figure 6	The number of years residents had lived in their current homes.....	13

TABLES

Table 1	Communities selected for the survey of flood risk perception, education and warnings.	6
Table 2	Is the area floodable or less likely/unlikely to flood?	11
Table 3	Reported home ownership and rental statistics	11
Table 4	Number of years respondents had lived in their current community and home.....	12
Table 5	Percentage of respondents who had lived 1 year and 5 years in their houses and wider community.....	13
Table 6	General demographic statistics	15
Table 7	Demographic statistics for employment status, income and highest educational qualification.....	15
Table 8	The most likely natural disaster that could affect your community	17
Table 9	Whether respondents had been affected by any previous events.....	18
Table 10	The extent that respondents were affected by different events, considering property damage, injuries and financial impact (1=Little impact, 10=Severe impact).....	19
Table 11	The extent that respondents were affected by different events, considering property damage, injuries and financial impact (1=Little impact, 10=Severe impact).....	20
Table 12	The last time residents thought their communities were flooded.....	22
Table 13	The last time residents thought the house where they live was flooded	22
Table 14	Which of the following have you or your family done to prepare for an emergency?	24
Table 15	Respondents' beliefs about preparing for flooding.....	24
Table 16	Respondents' belief about whether it is necessary to make preparations for floods versus whether they are living in a floodable area.....	25
Table 17	How concerned respondents are about floods (1=Not at all, 5=A great deal)	26
Table 18	In the next month or so do you intend to: (a) seek information about flood risk (b)seek information on things to do to prepare for a possible flood (c)become involved with a local group to discuss how to reduce flood risk to your community?	27
Table 19	Does your community have flood protection provided by a levee, and if "Yes", what level of protection do you think is provided?	28
Table 20	Are you insured against floods?	28

Table 21	Respondents views of elements that make up the different community's public flood warning systems.....	29
Table 22	On hearing a flood warning what would respondents do?.....	30
Table 23	What number would you call for help in a flood?.....	31
Table 24	Who would you contact for information in a flood?.....	32
Table 25	If you were told to evacuate your property during a flood, would you...?.....	33
Table 26	Flooded areas of road – what respondents would do when encountering this situation	34
Table 27	Flooded areas of road – what respondents would do when encountering this situation (breakdown by gender)	34
Table 28	Flooded areas of road – what respondents would do when encountering this situation (breakdown by age)	35
Table 29	Had respondents seen any flood information for their local river	36
Table 30	Have you heard or received any information about preparing for floods from the following places?.....	37
Table 31	Have you asked any of the following people, groups or organisations for information on how to get ready for floods?	38
Table 32	How would you prefer to get information on how to prepare your household/business for floods?	39
Table 33	In a flood, how would you prefer to receive information about that flood?	39
Table 34	Please indicate on the scale, whose responsibility you believe it is to protect us from flood (1=Not at all, 5=A great deal)	40
Table 35	Please indicate on the scale, how much you agree with the following statement, “There is no use preparing for floods as we can't do much anyway” (1=Not at all, 5=A great deal).....	40
Table 36	To what extent might each of the following prevent you from preparing for floods? (1=Not at all, 5=A great deal).....	41
Table 37	To what extent do you believe that: (1=Not at all, 5=A great deal).....	42
Table 38	Residents' sense of community: Please use the scale to indicate how much each statement applies/doesn't apply to you (1=Doesn't Apply, 5=Applies strongly)	43
Table 39	Residents' self efficacy: Please use the scale to indicate how much each statement applies/doesn't apply to you: (1=Doesn't Apply, 5=Applies strongly)	44
Table 40	Is your house raised above ground level?.....	45

APPENDICES

Appendix 1	Copy of the questionnaire sent to all towns (Maitland version)	51
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ABSTRACT

To improve public awareness and preparedness for local flooding and encourage a better response to flood warnings, the New South Wales State Emergency Services are in the process of developing a comprehensive public education strategy.

This report describes the results of a survey about flood perceptions and warnings undertaken in four communities in New South Wales Australia. The survey was conducted in Grafton, Narrabri, Albury and Maitland in November 2005. A total of 2000 questionnaires were delivered directly to houses in all four areas, with an overall return rate of 25%. The questionnaire included questions on: awareness, risk perception, previous exposure to flooding, information received concerning preparedness activities, information sought for preparedness purposes and the extent to which people engaged or plan to engage in preparedness activities.

The results of the survey provide a baseline understanding of current issues regarding flooding for respondents in the four communities. Having a baseline survey such as this also allows for the evaluation of future flood education programmes (by way of a comparison survey), and the identification and utilisation of effective strategies for flood preparedness and warnings.

KEYWORDS

Flood, hazard, education, warnings, perception, preparedness, understanding, community, New South Wales, Australia, Grafton, Narrabri, Albury, Maitland.

1.0 INTRODUCTION

Floods are the most damaging natural hazard in New South Wales, resulting in annualised losses in excess of \$150 million (State Emergency Services, 2001). The management of the flood risk is a shared partnership between a number of agencies and is outlined in the New South Wales Flood Plan.

Flood protection works are one of the most common mitigation options adopted over the last 100 years. However, due to a public desire to make use of floodplains, land-use planning and flood protection works do not provide mitigation for the entire risk. Warning systems have been developed to address the remaining residual risk.

In New South Wales flood warnings are disseminated by the State Emergency Services (SES) from information provided by the Bureau of Meteorology (State Emergency Services, 2001). The Bureau of Meteorology uses a 'Flood Watch' category, to warn of the possible onset of weather which could lead to flooding. When floods are developing, the Bureau of Meteorology predicts flood categories (minor, moderate and major), based on nationally-agreed definitions of consequence (e.g. roads closed, isolation and the inundation of rural areas and towns/suburbs) and using gauges as the target points. The New South Wales State Emergency Service has taken on the role of adding value to the Bureau's quantitative flood-height predictions, building up levels of flood intelligence which are used to 'translate' the prediction by indicating likely consequences, in the 'reference areas' around the gauges for which the predictions are issued (pers. comm. Chas Keys, June 2006). This planning for the value-adding task is being done state-wide.

Warnings are broadcast by local radio stations, and supplemented by door-to-door knocking by SES volunteers and police when evacuations are required. The effectiveness of these systems has been under review in recent time (Handmer, 2002a,b; Pfister, 2002) due to the often low evacuation compliance. In the review of the 2001 Grafton floods in New South Wales (Pfister, 2002), around 97% of residents surveyed reported hearing the flood warning and evacuation order, but only around 18% complied with the request to leave.

To improve public awareness, including warning response, the New South Wales SES is in the process of developing a comprehensive public education strategy (Gissing, 2003). The work presented in this report is aimed at evaluating the effectiveness of flood education programmes and improving response to warnings.

2.0 METHOD

2.1 Questionnaire

The primary research method used for finding out about flood risk perception, education and warnings in New South Wales communities was a self-administered questionnaire. These types of questionnaires provide an effective way to gather data from large, geographically dispersed populations. It is also possible to cover more complex issues in self-administered

surveys than over the telephone (Bartley, 1999). However, these surveys can also be slow; no interviewer is present in person to answer any questions respondents may have; there may be lower response rates in comparison with other methods; and the problem of respondent self selection may occur, which can lead to demographic biases.

Self-administered questionnaires were our preferred survey method because of their ability to allow respondents to make considered responses to complex and interlinked questions. However, we acknowledge that demographic bias may be present in the sample associated with this method. As a consequence, the conclusions and recommendations suggested here should be viewed with this in mind.

The questionnaire was developed in consultation with New South Wales State Emergency Services. A copy of the questionnaire can be found in Appendix 1.

2.2 Selection of communities

The communities selected to be part of this survey were chosen based on their propensity to flood and the current arrangements that they have in place to manage flood risk. Four towns were selected: Grafton (including Ulmarra), Narrabri, Albury and Maitland. Details of these towns are outlined in Table 1.

Table 1 Communities selected for the survey of flood risk perception, education and warnings.

Grafton

Population size: 17,426 (2001 census)

Flood History: Prior to the 2005 survey, the most recent flooding had occurred in March 2001 where water came to the top of the current levee, but did not over-top it (7.75m at the Prince Street gauge). A partially successful evacuation was undertaken to try to remove residents from danger. Some flooding (over-topping of the levee) also occurred at nearby Ulmarra in 2001.

Flood Protection: A levee system has been present in Grafton from the 1970s, with the New South Grafton levee completed in 1997. The levee system is designed to withhold floods to the 1% Annual Exceedance Probability (AEP) level (Paterson, 2000). Ulmarra also has a levee which was built in the 1970s.

Flood Education: Flood brochures were produced and distributed a few years prior to the survey in 2005.



Flooding in Grafton, May 1996 before the completion of the Heber St levee.

Narrabri

Population size: 6,245 (2001 census)

Flood History: The last floods to occur prior to the 2005 survey included local flooding in December 2004, with a few properties inundated and some minor flooding in 2005. Only minor flooding has occurred since 1955.

Flood Protection: No substantial levee.

Flood Education: Brochures were available regarding flooding in Narrabri prior to the 2005 survey.



Flooding in Narrabri, December 2004.

Albury

Population size: 42,148 (2001 census)

Flood History: No recent significant flooding had occurred prior to the 2005 survey and thus there had been no attempts to evacuate residents.

Flood Protection: A levee designed to withstand a 1 in 100 flood event (1% AEP).

Flood Education: No significant flood education had been undertaken prior to the 2005 survey.



Minor flooding in Albury, October 2000

Maitland

Population size: 53,470 (2001 census)

Flood History: Up to the 2005 survey, the last major flood was in 1955 at Maitland with some smaller flood events occurring since then.

Flood Protection: Post 1955, levees were built along the banks of the Hunter River from Oakhampton to Morpeth. However they generally cannot contain big floods (less than 10% AEP). Despite the use of spillways, buildings start to be flooded at 10% AEP or less (Webb, McKeown & Associates, 2007).

Flood Education: Recent flood education initiatives had taken place in Maitland prior to the 2005 survey.



Flooding in Maitland, 1955

2.3 Questionnaire delivery

In all, 2000 questionnaires were distributed throughout the selected New South Wales communities. Narrabri, Albury and Maitland all received 500 questionnaires each. Grafton township received 450 questionnaires and 50 questionnaires were delivered to nearby Ulmarra. Ulmarra's results are combined into the total number of questionnaires received back for Grafton, but can be separated out at a later stage if additional analysis is required.

Questionnaires were delivered by hand-delivery to letterboxes with the help of local SES volunteers in late November 2005. To gain an understanding of the perspectives of residents living in areas of different elevation, questionnaires were distributed randomly to houses both within known floodable areas (i.e. areas of 1% flood probability) and areas outside the high risk flood zone. Figures 1 to 4 show the delivery areas for the different towns.

In order to boost response rates, a reminder letter and survey were posted to addresses where the first questionnaires had been distributed. The reminder letter and survey were posted out in late December 2005.

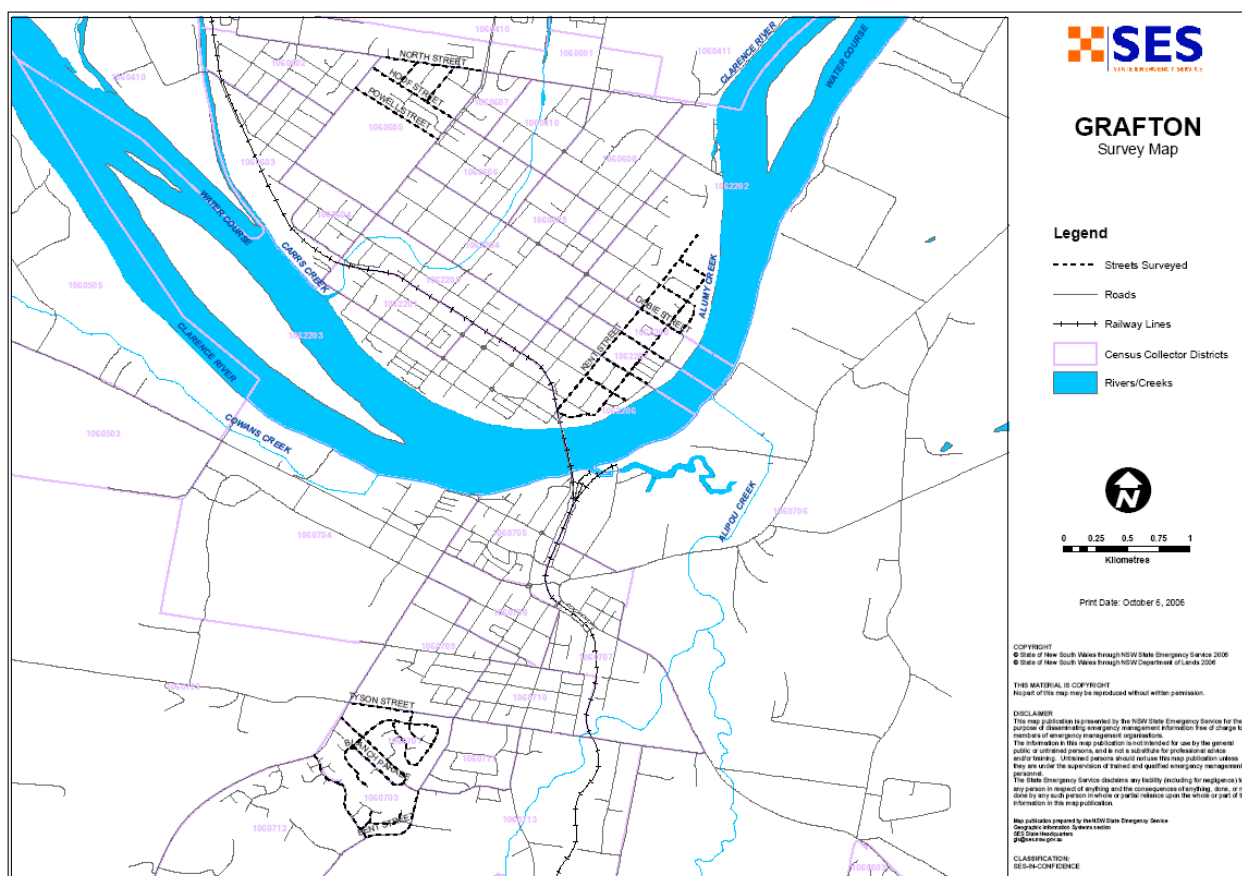


Figure 1 Survey delivery areas for Grafton with associated census data from relevant Collector Districts.

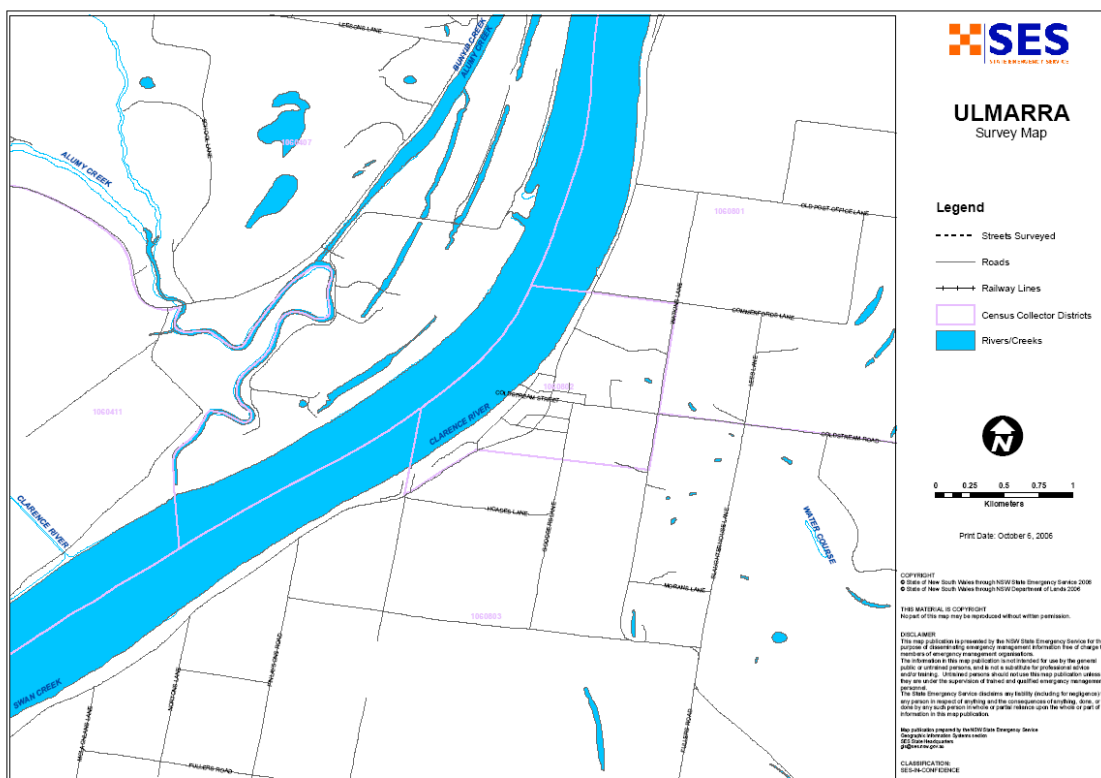


Figure 1a Survey delivery areas for Ulmarra (near Grafton) with associated census data from relevant Collector Districts.

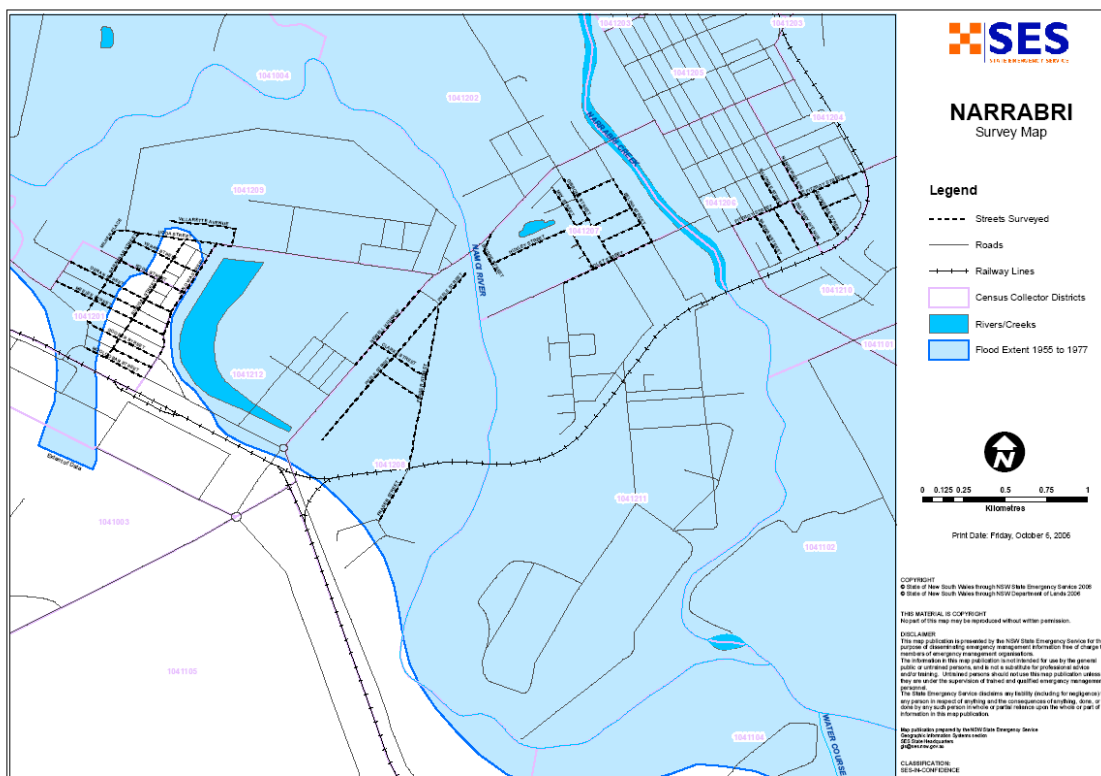


Figure 2 Survey delivery areas for Narrabri with associated census data from relevant Collector Districts.

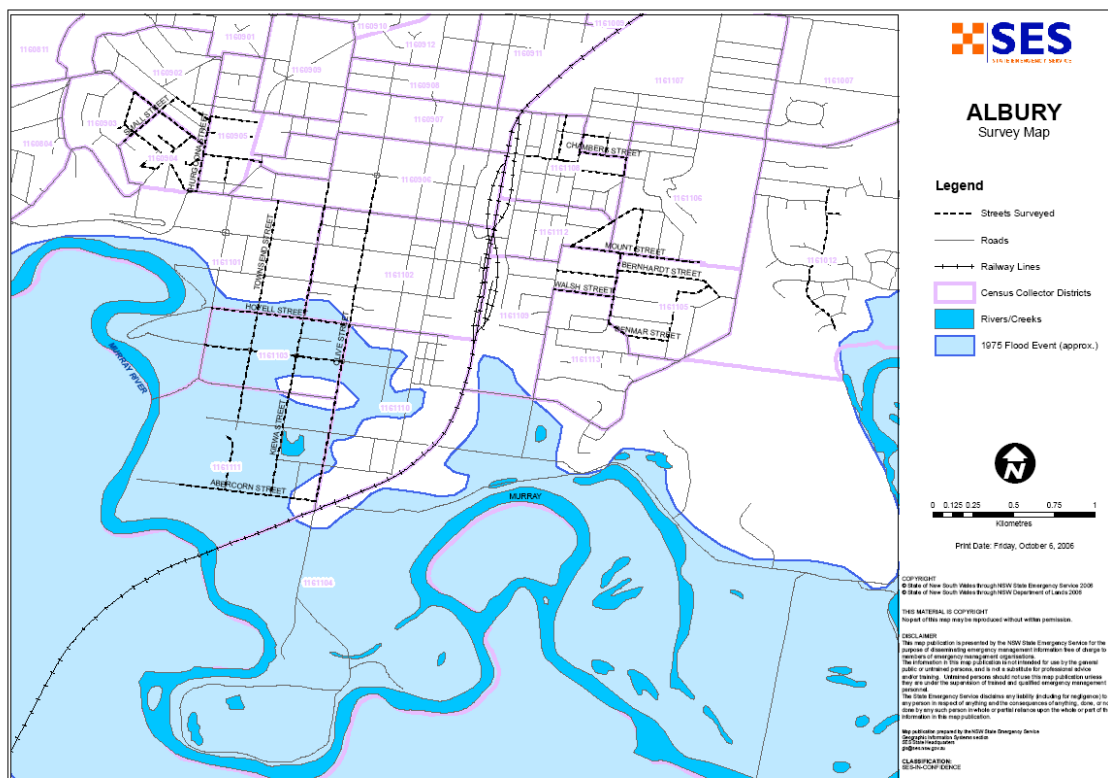


Figure 3 Survey delivery areas for Albury with associated census data from relevant Collector Districts.

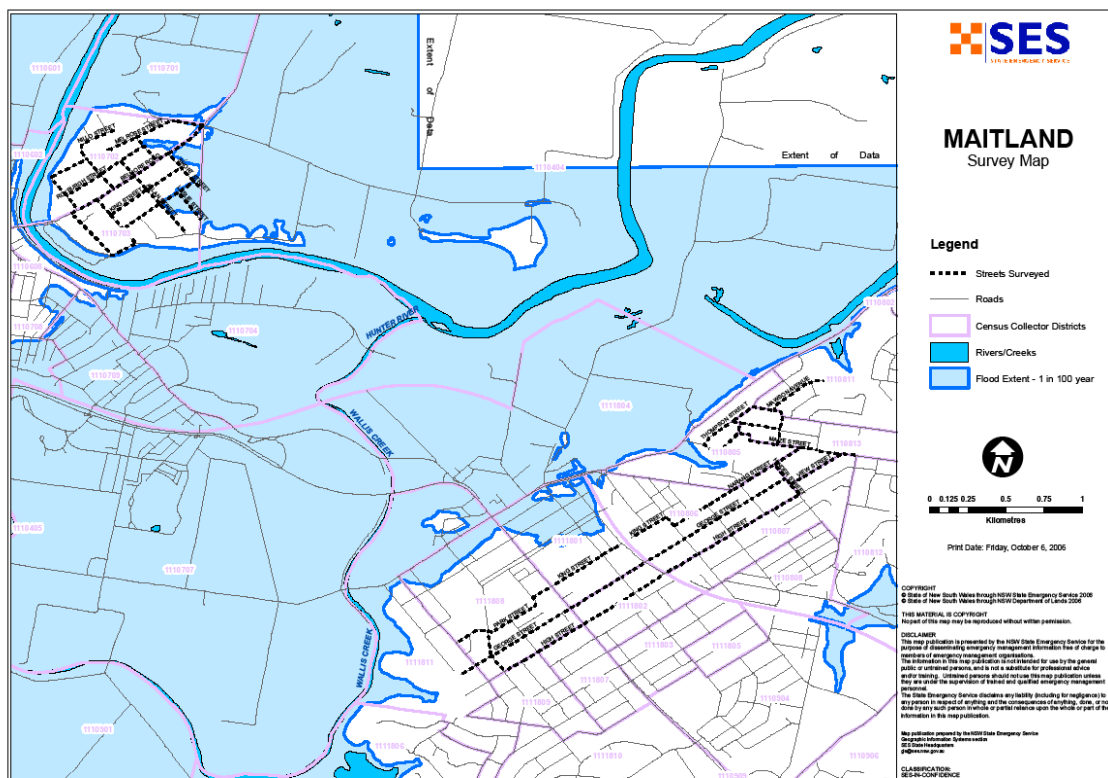


Figure 4 Survey delivery areas for Maitland with associated census data from relevant Collector Districts.

3.0 RESULTS

3.1 Return rates

Return rates from the survey were slightly above the rates expected for postal surveys (typically 20%). Overall, out of 2000 successfully delivered questionnaires, 479 (25%) surveys were returned to us. Maitland and Grafton had the highest return rates (28%), followed by Narrabri and Albury (22%).

Table 2 shows the approximate ratios of surveys returned from floodable areas (i.e. 1% flood probability) versus areas that are less likely or unlikely to flood.

Table 2 Is the area floodable or less likely/unlikely to flood?

	Location									
	Grafton		Narrabri		Albury		Maitland		All respondents	
	N	%	N	%	N	%	N	%	N	%
No answer	0	.0%	0	.0%	0	.0%	0	.0%	0	.0%
Likely to flood	73	55.3%	70	65.4%	51	49.0%	66	48.5%	260	54.3%
Less or unlikely to flood	59	44.7%	37	34.6%	53	51.0%	70	51.5%	219	45.7%
Total	132	100.0%	107	100.0%	104	100.0%	136	100.0%	479	100.0%

4.0 REPRESENTATIVENESS OF SAMPLE

4.1 Home ownership

Nearly 90% of residents living in Narrabri own their own home, with under 10% of people renting (Table 3). Grafton and Maitland have similar home ownership statistics at around 85% and 88% respectively. The town with the least amount of home ownership is Albury at 74%, where there are a greater proportion of people surveyed living in rental properties (26%). Very few respondents from any of the towns surveyed reported that they own holiday homes (only 1% in Albury and 2% in Maitland).

In general, comparison with the Australian 2001 census data suggests that a greater proportion of home-owners answered the questionnaire, and lesser numbers of people renting filled it out. This trend is true of all of the four towns surveyed.

Table 3 Reported home ownership and rental statistics

Do you/someone in your house own or rent the home you live in?	Location							
	Grafton		Narrabri		Albury		Maitland	
	Survey %	Census %	Survey %	Census %	Survey %	Census %	Survey %	Census %
Own or buying a house	84.7%	67%	89.5%	61%	73.8%	65%	88.4%	72%
Rent	15.3%	31%	9.5%	36%	26.2%	33%	10.9%	27%
Other (specify)	0%	2%	1.0%	3%	0%	2%	.8%	2%

4.2 Number of years living in the community

Narrabri residents had spent the greatest number of years living within their community, at a mean of 35 years. Albury residents had spent the least number of years living in their community (22 years) with Maitland and Grafton between the two (Table 4). In terms of the amount of time spent living in their current homes, Maitland and Narrabri residents had spent the greatest number of years in their houses (at a mean of just under 20 years), with Grafton on 14 years and Albury on 12 years.

Despite some quite high means the figures below (Figures 5 and 6) still show a significant proportion of respondents who have only lived a few years in their houses or communities. The means are driven up by lesser numbers of residents who have lived in the same place for over 50 years or more.

Table 4 Number of years respondents had lived in their current community and home

	Location											
	Grafton			Narrabri			Albury			Maitland		
	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N
Years in community	24.94	19.27	131	34.73	20.59	103	22.20	20.23	103	28.98	23.14	128
Years in current home	14.34	14.61	130	18.92	15.65	104	11.77	14.68	103	19.49	18.65	128

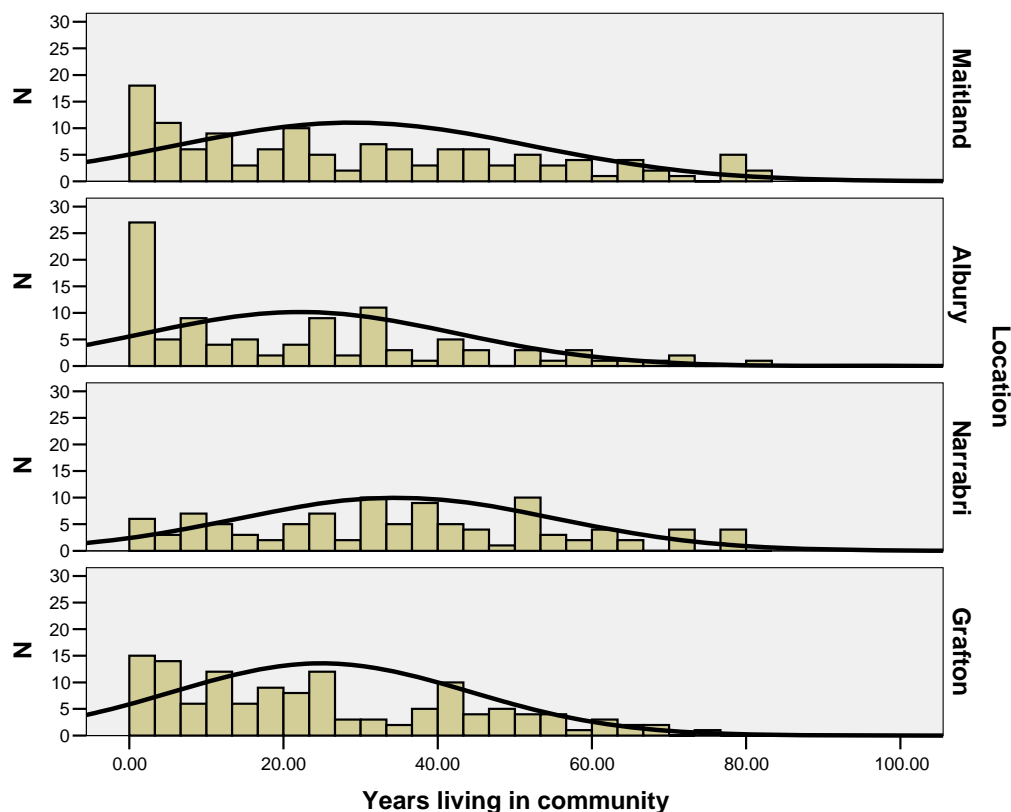


Figure 5 The number of years residents had lived in their community.

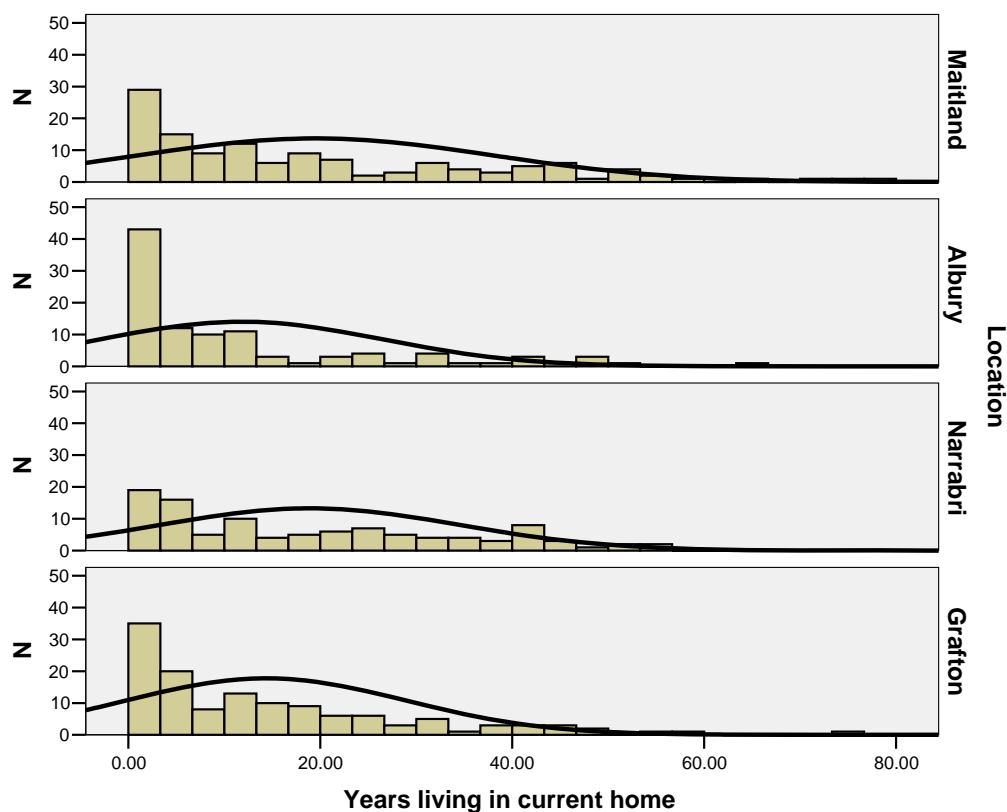


Figure 6 The number of years residents had lived in their current homes.

The 2001 census data indicates that:-

- In Grafton 81% of residents had reported living in the same house for the last year, with 57% living in the same house for five years.
- In Narrabri 81% of residents had reported living in the same house for the last year, with 57% living in the same house for five years.
- In Albury 79% of residents had reported living in the same house for the last year, with 52% living in the same house for five years.
- In Maitland 83% of residents had reported living in the same house for the last year, with 60% living in the same house for five years.

This census data can be compared with figures calculated from responses given by the survey respondents (Table 5). The survey data shows that higher proportions of long term residents answered the questionnaire compared with the general demographic data for the area.

Table 5 Percentage of respondents who had lived 1 year and 5 years in their houses and wider community

	Grafton	Narrabri	Albury	Maitland
Have lived for at least 1 year in this community	95%	99%	92%	98%
Have lived for 5 years in this community	85%	94%	74%	84%
Have lived for at least 1 year in the same house	89%	96%	87%	96%
Have lived for at least 5 years in the same house	67%	77%	52%	73%

4.3 General demographics

Tables 6 and 7 show the general demographic statistics (compared with census data) for each town surveyed. The main points from the general demographic statistics are as follows:

- In Grafton, Narrabri and Maitland approximately half the respondents to the questionnaire reported as male and half were female. In Albury, however, there was some demographic bias with more females (60%) than males answering the questionnaire.
- Narrabri and Maitland had the greatest percentage of couples with families with children (30-34%) followed by Grafton (27%) and Albury (23%). Grafton had the greatest number of couples without children (40%). All towns had similar percentages of single parent families (less than 9%) and people living alone (18-19%). On comparison with the census data, it appears that a greater proportion of couples without children, and people living alone, answered the questionnaire than couples with children.
- Most respondents who answered the questionnaire regarded themselves as Australian (89% or over). Less than 2% of respondents from Narrabri, Grafton and Maitland recorded their ethnicity as Aboriginal or Torres Strait Islander origin and no-one from Maitland reported this to be the case. Maitland had the greatest number of respondents who chose "Other" with respect to ethnic background (10%). This is generally consistent with the census results except in Narrabri where the proportions of Aboriginal/Torres Strait Islanders who answered the questionnaire were less than those indicated in the census.
- A high percentage of respondents from all the towns surveyed reported that they were born in Australia (91% or over), which is consistent with census data.
- In terms of age, the majority of respondents from Narrabri, Maitland and Albury were aged 45-64 years, and in Grafton the greatest percentage of respondents were aged 65 years or over. When comparing with the census results, it is evident that there is some bias, with lower proportions of people aged 18-44 answering the survey, and slightly greater proportions of those aged over 45.
- A large percentage of respondents from Grafton were not in paid employment (59%), however this is likely to be strongly influenced by the fact that many were aged over 65 years. Narrabri had the highest percentage of full time employment (45%), with the other towns falling below that figure. In Grafton and Albury the census figures closely matched the statistics for the survey data, however in Narrabri there was a bias toward those in full and part-time employment, and in Maitland a bias toward people in part-time employment.
- Gross household income for 2004 was evenly spread across all the towns from very low levels of income (under \$10,000) to over \$90,000. While the 2001 census figures are not directly comparable (as the census collects weekly income rather than yearly income), it appears there may be a slight bias toward people in the lower and upper income brackets, with more of those people answering the questionnaire.
- In terms of educational qualifications, survey respondents appear to be biased toward having qualifications of some sort including either a professional/trade certificate, university undergraduate or university post-graduate degree. Lesser proportions of respondents had school, or no qualifications, when compared with the census data.

Table 6 General demographic statistics

		Location							
		Grafton		Narrabri		Albury		Maitland	
		Survey %	Census %	Survey %	Census %	Survey %	Census %	Survey %	Census %
Gender	Male	53.3%	49%	48.5%	50%	40.0%	48%	49.2%	49%
	Female	46.7%	51%	51.5%	50%	60.0%	52%	50.8%	51%
Which best describes your living situation?	Couple family with children	26.6%	47%	34.3%	50%	22.7%	48%	30.5%	56%
	Couple family without children	40.6%	22%	35.2%	21%	37.1%	20%	32.1%	18%
	One parent family	8.6%	16%	2.9%	13%	8.2%	14%	7.6%	15%
	Other family	2.3%	1%	4.8%	1%	4.1%	1%	2.3%	1%
	Alone	18.8%	12%	18.1%	11%	18.6%	12%	19.8%	8%
	With other people, not family	.8%	3%	1.9%	3%	6.2%	5%	2.3%	2.3%
	Other (specify)	2.3%	-	2.9%	-	3.1%	-	5.3%	-
Ethnic background	Australian	95.3%	89%	94.3%	86%	93.8%	90%	89.3%	92%
	Aboriginal or Torres Strait Islander origin	1.6%	5%	1.9%	9%	0%	2%	.8%	2%
	Other (specify)	3.1%	6%	3.8%	5%	6.2%	8%	9.9%	6%
Were you born in Australia?	Yes	94.6%	96%	93.3%	96%	93.8%	91%	91.6%	93%
	No	5.4%	4%	6.7%	4%	6.2%	9%	8.4%	7%
Age	18-24 years	3.2%	10%	3.8%	11%	7.3%	14%	2.3%	13%
	25-44 years	23.0%	35%	25.0%	39%	33.3%	38%	27.5%	40%
	45-64 years	33.3%	31%	45.2%	31%	39.6%	30%	44.3%	31%
	65 years and over	40.5%	24%	26.0%	19%	19.8%	18%	26.0%	16%

Table 7 Demographic statistics for employment status, income and highest educational qualification

		Location							
		Grafton		Narrabri		Albury		Maitland	
		Survey %	Census %	Survey %	Census %	Survey %	Census %	Survey %	Census %
Employment status	Employed full-time	30.1%	29%	45.1%	30%	42.1%	38%	31.0%	29%
	Employed part-time	11.4%	17%	17.6%	2%	16.8%	20%	21.7%	3%
	Not in paid employment	58.5%	54%	37.3%	68%	41.1%	42%	47.3%	69%
Household 2004 gross income	Under \$10,000	9.2%	0.5%	6.7%	0.5%	3.4%	1%	7.0%	0.5%
	\$10,001 to \$15,000	10.1%	20%	9.0%	16%	9.0%	17%	13.0%	14%
	\$15,001 to \$20,000	14.7%	15%	4.5%	11%	4.5%	10%	11.3%	12%
	\$20,001 to \$30,000	13.8%	12%	12.4%	9%	10.1%	8%	11.3%	9%
	\$30,001 to \$40,000	5.5%	22%	12.4%	20%	7.9%	20%	8.7%	19%
	\$40,001 to \$50,000	8.3%	9%	5.6%	11%	9.0%	11%	4.3%	10%
	\$50,001 to \$60,000	10.1%	7%	5.6%	9%	6.7%	9%	5.2%	9%
	\$60,001 +	28%	15%	44%	21%	49%	23%	39%	26%
Highest educational qualification	School qualifications or less	44.0%	70%	43.0%	70%	32.0%	62%	42.0%	65%
	Trade certificate or professional certificate	34.7%	22%	30.0%	22%	33.3%	27%	31.8%	28%
	University undergraduate degree	16.1%	6%	16.0%	6%	26.0%	8%	17.1%	6%
	University postgraduate degree	4.8%	2%	11.0%	1%	8.3%	3%	9.3%	2%

5.0 PERCEPTIONS OF FLOOD RISK

5.1 The most likely natural disaster that could affect your community

The most likely natural disaster anticipated by respondents to affect their community was flooding (Table 8) with 85% of total respondents thinking that this was likely. This was closely followed by a thunderstorm with high winds and/or hail (79% of total respondents). Bushfire (20%), windstorms (10%), earthquake (3%) and tsunami (0%) were all thought to be disasters that were less likely to impact on communities. (Note: Some of the towns are located inland, where there is no risk of tsunami).

When breaking down the statistics for different towns, Narrabri was the town with the highest percentage of respondents who thought that a flood was likely to impact upon them (96%). Grafton and Maitland also had high percentages of respondents who thought that a flood was likely to affect their community (88-90%). Narrabri, Grafton and Maitland all thought that a thunderstorm with wind/hail was the second most likely natural disaster that could affect their community (with responses ranging from 73-86%).

Albury had a much lower response to the suggestion of flooding with only 64% of respondents indicating that they thought a flood was likely. Albury residents felt there was a higher chance of a thunderstorm with high wind/hail occurring (73%), than flooding. This figure may have been influenced, by a storm which affected Albury on 2nd December 2006, while the surveys were being collected. For Albury, bushfire also seemed to have a reasonably high profile with 48% of respondents reporting this disaster was likely.

Table 8 The most likely natural disaster that could affect your community

Two most likely natural disasters		Location									
		Grafton		Narrabri		Albury		Maitland		Total	
		Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Flood	No	13	9.8%	4	3.8%	38	36.5%	16	11.9%	71	14.9%
	Yes	119	90.2%	102	96.2%	66	63.5%	118	88.1%	405	85.1%
Thunderstorm with high winds and/or hail	No	18	13.6%	27	25.5%	28	26.9%	25	18.7%	98	20.6%
	Yes	114	86.4%	79	74.5%	76	73.1%	109	81.3%	378	79.4%
Windstorm	No	121	91.7%	92	86.8%	90	86.5%	124	92.5%	427	89.7%
	Yes	11	8.3%	14	13.2%	14	13.5%	10	7.5%	49	10.3%
Bushfire	No	116	87.9%	89	84.0%	54	51.9%	121	90.3%	380	79.8%
	Yes	16	12.1%	17	16.0%	50	48.1%	13	9.7%	96	20.2%
Earthquake	No	130	98.5%	106	100.0%	103	99.0%	124	92.5%	463	97.3%
	Yes	2	1.5%	0	0%	1	1.0%	10	7.5%	13	2.7%
Tsunami	No	132	100.0%	106	100.0%	104	100.0%	134	100.0%	476	100.0%
	Yes	0	0%	0	0%	0	0%	0	0%	0	.0%
Other	No	131	99.2%	105	99.1%	102	98.1%	132	98.5%	470	98.7%
	Yes	1	.8%	1	.9%	2	1.9%	2	1.5%	6	1.3%
Other please specify											
Dam wall collapsing		0	0%	0	0%	1	1.0%	0	0%	1	.2%
El Nino		0	0%	0	0%	1	1.0%	0	0%	1	.2%
Explosion (Cargill)		0	0%	1	9%	0	0%	0	0%	1	.2%
House fire		1	.8%	0	0%	0	0%	0	0%	1	.2%
Nil		0	0%	0	0%	0	0%	1	.7%	1	.2%
Terrorist		0	0%	0	0%	0	0%	1	.7%	1	.2%

5.2 Had the respondent been affected by any previous events.

When considering all the respondents to the questionnaire across the four towns surveyed, 66% had experienced a thunderstorm with high winds/hail, 59% had been affected by a flood and 28% had been affected by a windstorm (Table 9). All other event types were experienced by less than 20% of respondents. Fifteen per cent said that no events had affected them.

In terms of flooding, residents' from Narrabri had most been affected by flooding in the past with 82% acknowledging that this was the case. (This high indication may be partly due to the fact that a greater number of Narrabri residents who returned their questionnaire (65%) were living in areas more likely to flood). This was closely followed by Grafton on 71%. Maitland and Albury respondents had had less experience of flooding with only 45% of those from Maitland indicating they had experienced flooding, and 35% from Albury.

The other previous type of event to have affected large numbers of respondents was thunderstorms with high winds/hail. Nearly 75% of respondents in Narrabri and Grafton noted that they had been affected by this type of event and nearly 59% of respondents in Albury and Maitland. Notably 46.2% of respondents in Narrabri indicated that they had been affected by a windstorm also. Other types of events generally only affected around a quarter or less of respondents from the different towns.

Table 9 Whether respondents had been affected by any previous events.

Have you ever been affected by...		Grafton		Narrabri		Albury		Maitland		Total	
		Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Flood	No	37	28.9%	19	17.9%	67	65.0%	70	54.7%	193	41.5%
	Yes	91	71.1%	87	82.1%	36	35.0%	58	45.3%	272	58.5%
Thunderstorm with high winds and/or hail	No	35	27.3%	27	25.5%	43	41.7%	53	41.4%	158	34.0%
	Yes	93	72.7%	79	74.5%	60	58.3%	75	58.6%	307	66.0%
Windstorm	No	94	73.4%	57	53.8%	79	76.7%	104	81.3%	334	71.8%
	Yes	34	26.6%	49	46.2%	24	23.3%	24	18.8%	131	28.2%
Bushfire	No	100	78.1%	89	84.0%	73	70.9%	115	89.8%	377	81.1%
	Yes	28	21.9%	17	16.0%	30	29.1%	13	10.2%	88	18.9%
Earthquake	No	126	98.4%	105	99.1%	100	97.1%	81	63.3%	412	88.6%
	Yes	2	1.6%	1	.9%	3	2.9%	47	36.7%	53	11.4%
Tsunami	No	128	100.0%	106	100.0%	103	100.0%	128	100.0%	465	100.0%
	Yes	0	0%	0	0%	0	0%	0	0%	0	0%
Other	No	127	99.2%	103	97.2%	100	97.1%	124	96.9%	454	97.6%
	Yes	1	.8%	3	2.8%	3	2.9%	4	3.1%	11	2.4%
No events have affected me	No	115	89.8%	99	93.4%	81	78.6%	103	79.8%	398	85.4%
	Yes	13	10.2%	7	6.6%	22	21.4%	26	20.2%	68	14.6%
Other please specify											
But not in this locality!		1	.8%	0	0%	0	0%	0	0%	1	.2%
Cyclone - WA		0	0%	0	0%	0	0%	1	.7%	1	.2%
Cyclone		0	0%	1	.9%	0	0%	1	.7%	2	.4%
Cyclone (not in this area)		0	0%	0	0%	1	1.0%	0	0%	1	.2%
Drought		1	.8%	1	.9%	0	0%	0	0%	2	.4%
Dust storm		0	0%	0	0%	1	1.0%	0	0%	1	.2%
Flood and bushfire prior to moving here		0	0%	0	0%	0	0%	1	.7%	1	.2%
Flood level affects property value		0	0%	0	0%	0	0%	1	.7%	1	.2%
Lightning strike		0	0%	0	0%	0	0%	1	.7%	1	.2%
Mini cyclone		0	0%	1	.9%	0	0%	0	0%	1	.2%
Sandstorm		0	0%	0	0%	1	1.0%	0	0%	1	.2%

5.3 The extent to which respondents were affected by various events

Overall, respondents appeared to be most affected by flooding, thunderstorms and windstorms, choosing rankings of between 4 and 5 to represent the impacts of past events (Table 10). A ranking in this range still represents only a 'moderate impact' rather than a 'severe impact' as the rankings fall in the middle of the overall spectrum.

In terms of flooding, residents from Maitland gave the highest ranking of nearly '6', suggesting the impacts they suffered as a result of flooding were slightly higher than 'moderate' but still could not be considered 'severe'. Grafton, Narrabri and Maitland respondents all gave rankings falling under '5'. Narrabri ranked the effects of previous thunderstorms with high winds/hail slightly higher than that of flooding.

A low standard deviation (i.e. closer to '0') suggests that respondents tend to agree on the effect that past events have had on them. In terms of flooding Grafton, Narrabri and Albury all have standard deviations around 2.5 showing that a degree of spread does exist within people's opinions. Maitland residents (with a standard deviation of 3.16) show the least agreement about the effect that flooding has had on them.

Table 10 The extent that respondents were affected by different events, considering property damage, injuries and financial impact (1=Little impact, 10=Severe impact)

	Location											
	Grafton			Narrabri			Albury			Maitland		
	Mean	Standard Deviation	Valid N	Mean	Standard Deviation	Valid N	Mean	Standard Deviation	Valid N	Mean	Standard Deviation	Valid N
Extent affected by Flood	4.07	2.68	90	4.93	2.80	88	3.68	2.30	41	5.92	3.16	62
Extent affected by Thunderstorm with high winds and/or hail	4.76	2.67	93	5.19	2.28	80	3.82	2.21	62	4.04	2.26	81
Extent affected by Windstorm	4.00	2.43	38	4.39	2.55	57	4.60	2.21	30	4.15	2.26	34
Extent affected by Bushfire	4.34	2.92	29	2.17	1.66	24	3.59	2.60	32	3.96	2.81	25
Extent affected by Earthquake	1.00	0	9	1.42	1.16	12	4.60	3.78	5	3.62	1.97	52
Extent affected by Tsunami	1.00	0	7	1.00	0	10	1.00	0	3	1.71	1.50	7
Extent affected by Other (specify)	7.00	1.41	2	5.33	3.79	3	4.33	3.51	3	6.67	3.21	3

5.4 When respondents thought certain disasters were next likely to affect their community

The combined respondents from all four towns felt that within the next year a thunderstorm with high winds/hail (68%) or a windstorm (45%) would be most likely to affect their town (Table 11). When looking at a five year time scale, respondents indicated that the flooding (49%) or bushfire (30%) would be most likely to occur within that time frame. A substantial percentage of respondents thought that they would never experience an earthquake (45%) or a tsunami (86%).

When looking at flooding specifically, both Grafton and Narrabri residents (64-66%) felt that flooding was most likely to occur within the time period of the next five years. Albury and Maitland were split more evenly with around a third indicating that they thought flooding would occur in the next five years and a similar percentage suggesting that they felt flooding would affect their community within the longer time frame of twenty years. These survey results are consistent with questionnaires undertaken in other communities where the greatest proportion of respondents usually indicate that they believe a flood will occur in the near future, possibly sometime in the next ten to twenty years (e.g. Johnston et al., 2002)

Table 11 The extent that respondents were affected by different events, considering property damage, injuries and financial impact (1=Little impact, 10=Severe impact)

Next likely to be affected by...		Location									
		Grafton		Narrabri		Albury		Maitland		Total	
		Column Valid N %	N	Column Valid N %	N	Column Valid N %	N	Column Valid N %	N	Column Valid N %	N
Flood	Within the next year	20.0%	24	23.5%	24	13.1%	13	2.4%	3	14.3%	64
	Within the next 5 years	64.2%	77	65.7%	67	36.4%	36	31.0%	39	49.0%	219
	Within next 20 years	13.3%	16	10.8%	11	35.4%	35	34.9%	44	23.7%	106
	Within next 50 years	1.7%	2	0%	0	7.1%	7	17.5%	22	6.9%	31
	In over 50 years	0%	0	0%	0	4.0%	4	8.7%	11	3.4%	15
	Never	.8%	1	0%	0	4.0%	4	5.6%	7	2.7%	12
	Total	100.0%	120	100.0%	102	100.0%	99	100.0%	126	100.0%	447
Thunder -storm with high winds and/or hail	Within the next year	76.7%	92	65.7%	67	68.3%	69	62.0%	75	68.2%	303
	Within the next 5 years	20.0%	24	30.4%	31	26.7%	27	33.1%	40	27.5%	122
	Within next 20 years	2.5%	3	3.9%	4	5.0%	5	3.3%	4	3.6%	16
	Within next 50 years	.8%	1	0%	0	0%	0	.8%	1	.5%	2
	In over 50 years	0%	0	0%	0	0%	0	0%	0	0%	0
	Never	0%	0	0%	0	0%	0	.8%	1	.2%	1
	Total	100.0%	120	100.0%	102	100.0%	101	100.0%	121	100.0%	444

Table 11 continued

Wind-storm	Within the next year	44.8%	47	47.8%	43	42.1%	40	44.0%	48	44.6%	178
	Within the next 5 years	31.4%	33	42.2%	38	36.8%	35	33.9%	37	35.8%	143
	Within the 20 years	12.4%	13	7.8%	7	16.8%	16	11.9%	13	12.3%	49
	Within the 50 years	3.8%	4	2.2%	2	1.1%	1	.9%	1	2.0%	8
	In over 50 years	2.9%	3	0%	0	2.1%	2	.9%	1	1.5%	6
	Never	4.8%	5	0%	0	1.1%	1	8.3%	9	3.8%	15
	Total	100.0%	105	100.0%	90	100.0%	95	100.0%	109	100.0%	399
Bushfire	Within the next year	35.0%	36	25.6%	21	25.5%	24	18.5%	20	26.1%	101
	Within the next 5 years	24.3%	25	39.0%	32	38.3%	36	20.4%	22	29.7%	115
	Within next 20 years	3.9%	4	17.1%	14	20.2%	19	11.1%	12	12.7%	49
	Within next 50 years	4.9%	5	2.4%	2	5.3%	5	5.6%	6	4.7%	18
	In over 50 years	7.8%	8	1.2%	1	2.1%	2	.9%	1	3.1%	12
	Never	24.3%	25	14.6%	12	8.5%	8	43.5%	47	23.8%	92
	Total	100.0%	103	100.0%	82	100.0%	94	100.0%	108	100.0%	387
Earthquake	Within the next year	0%	0	0%	0	2.3%	2	1.8%	2	1.1%	4
	Within the next 5 years	0%	0	0%	0	4.6%	4	7.2%	8	3.2%	12
	Within next 20 years	5.2%	5	9.1%	7	12.6%	11	22.5%	25	12.9%	48
	Within next 50 years	9.3%	9	3.9%	3	10.3%	9	31.5%	35	15.1%	56
	In over 50 years	23.7%	23	22.1%	17	23.0%	20	20.7%	23	22.3%	83
	Never	61.9%	60	64.9%	50	47.1%	41	16.2%	18	45.4%	169
	Total	100.0%	97	100.0%	77	100.0%	87	100.0%	111	100.0%	372
Tsunami	Within the next year	0%	0	0%	0	1.1%	1	0%	0	.3%	1
	Within the next 5 years	0%	0	0%	0	0%	0	1.0%	1	.3%	1
	Within next 20 years	4.1%	4	1.3%	1	1.1%	1	2.9%	3	2.5%	9
	Within next 50 years	6.2%	6	0%	0	0%	0	1.9%	2	2.2%	8
	In over 50 years	13.4%	13	1.3%	1	3.4%	3	13.3%	14	8.4%	31
	Never	76.3%	74	97.4%	75	94.3%	83	81.0%	85	86.4%	317
	Total	100.0%	97	100.0%	77	100.0%	88	100.0%	105	100.0%	367

5.5 The last time a respondent's community was flooded.

The questionnaire asked respondents to note down the last time when they thought their community was flooded. It is important to note that the results for this question are largely dependent on the location of the respondent, and their concept of 'community'. For example, some respondents located in streets or suburbs closer to floodable areas may be inundated more often in flooding events. As part of the analysis we focus on the answer that the largest percentage of respondents indicated as 'correct'.

The majority of respondents from Grafton (70%) indicated that their community was flooded in the last 20 years (Table 12). Albury respondents were more divided (thus perhaps showing some uncertainty amongst residents) but again the largest number of people who answered this question felt that flooding had occurred in the last 20 years (34%). The greatest percentage of Narrabri residents said that their community had been flooded in the last year (47%) and for Maitland most indicated that the last time flooding had occurred was within 50 years (50%).

From the figures, it appears that respondents from three of the communities surveyed have an accurate knowledge of past flood events. Grafton residents were accurate in indicating that flooding had occurred in the last 20 years. Likewise most residents were correct in indicating that Narrabri had had minor flooding in 2004, and that the last big flood in Maitland was within the last 50 years. Albury was more divided however, when choosing a date for the last time the community was flooded, and this may be due to several factors including:-

- There have not been any floods of major consequence in Albury since the 1970s;
- There has been a lack of locally focussed education about flooding, and consequently Albury residents have been exposed to only more general state-wide flood education.

Table 12 The last time residents thought their communities were flooded

Last time community was flooded	Location									
	Grafton		Narrabri		Albury		Maitland		Total	
	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Never	4	3.1%	0	.0%	4	3.9%	1	.7%	9	1.9%
In the last year	1	.8%	49	46.7%	19	18.4%	1	.7%	70	14.9%
In the last 2 years	24	18.8%	29	27.6%	12	11.7%	4	3.0%	69	14.6%
In the last 20 years	90	70.3%	25	23.8%	35	34.0%	24	17.8%	174	36.9%
In the last 50 years	5	3.9%	2	1.9%	17	16.5%	68	50.4%	92	19.5%
More than 50 years ago	0	0%	0	0%	1	1.0%	34	25.2%	35	7.4%
Don't know	4	3.1%	0	0%	15	14.6%	3	2.2%	22	4.7%

5.6 The last time a respondent's house was flooded

The majority of respondents located in Grafton (60%), Narrabri (45%) and Albury (69%) indicated that they thought that the house where they lived had never been flooded (Table 13). Those that did think that the house had been flooded thought that it had happened at least 20 years ago or longer. Between 4 and 15% of respondents from all towns did not know if their house had been flooded or not.

A far smaller percentage (30%) of Maitland residents felt that their house had never been flooded at all. The majority of respondents indicated that they thought that their house had been flooded either around or over 50 years ago.

Table 13 The last time residents thought the house where they live was flooded

Last time house where you live was flooded	Location									
	Grafton		Narrabri		Albury		Maitland		Total	
	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Never	76	59.8%	46	45.1%	72	69.2%	40	29.6%	234	50.0%
In the last year	0	.0%	1	1.0%	3	2.9%	0	.0%	4	.9%
In the last 2 years	0	.0%	5	4.9%	0	.0%	0	.0%	5	1.1%
In the last 20 years	9	7.1%	23	22.5%	6	5.8%	2	1.5%	40	8.5%
In the last 50 years	22	17.3%	21	20.6%	4	3.8%	51	37.8%	98	20.9%
More than 50 years ago	4	3.1%	2	2.0%	3	2.9%	35	25.9%	44	9.4%
Don't know	16	12.6%	4	3.9%	16	15.4%	7	5.2%	43	9.2%

6.0 PREPAREDNESS FOR FLOODING

6.1 Current preparations

Respondents were asked about which items they had already collected, or what actions they had already undertaken to prepare for flooding (Table 14). Items that were identified as already collected by residents across the four towns included torches (82%), batteries (61%), candles/matches (57%), first aid kit (57%) and portable radios (55%). The actions least likely to be carried out, included preparing a home flood plan, preparing an emergency kit and having the home inspected for preparedness (all under 8%).

Narrabri residents were more likely to have collected items for preparedness (e.g. torch, batteries, etc) than residents from the other towns surveyed. They were also more likely to have thought about whether they lived in a vulnerable area (56%) and how to lift precious items off the ground (59%). Albury residents appeared to be the least prepared overall, with lesser numbers of respondents reporting that they had stored items such as portable radios (32%), candles (45%), first aid kits (46%), batteries (47%) and torches (69%). A significantly higher number (28%) of Albury residents, compared with those of other towns, agreed with the statement, “I/we have done nothing”.

Such figures are consistent with findings from other surveys about preparedness, where respondents will often have collected regular house household items, but are less likely to have undertaken more complex tasks (e.g. Johnston et al., 2002; Leonard et al., 2004).

Table 14 Which of the following have you or your family done to prepare for an emergency?

	Location				
	Grafton	Narrabri	Albury	Maitland	Total
	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %
Made sure I/we have a portable radio	65.4%	67.3%	32.0%	51.1%	54.6%
Picked an emergency contact person outside of the district	14.6%	13.1%	6.8%	12.2%	11.9%
Arranged for someone in family to learn first aid	25.4%	27.1%	27.2%	23.7%	25.7%
Found out if we are in a vulnerable area	47.7%	56.1%	28.2%	51.9%	46.5%
Had home inspected for preparedness	3.1%	6.5%	1.0%	.8%	2.8%
Talked to family members about what to do	22.3%	26.2%	5.8%	13.0%	17.0%
Thought about how to lift precious items off the ground	48.5%	58.9%	8.7%	35.1%	38.4%
Considered how to access the roof	15.4%	28.0%	10.7%	34.4%	22.5%
Considered access to essential items	20.8%	28.0%	4.9%	18.3%	18.3%
Prepared a home flood plan	12.3%	13.1%	2.9%	3.1%	7.9%
Prepared an emergency kit	10.0%	10.3%	4.9%	6.1%	7.9%
Made sure I/we have a torch	86.2%	89.7%	68.9%	81.7%	82.0%
Other (specify)	5.4%	3.7%	5.8%	4.6%	4.9%
I/we have done nothing	11.5%	6.5%	28.2%	13.7%	14.6%
Made sure I/we have spare batteries	67.7%	70.1%	46.6%	61.1%	61.8%
Made sure I/we have a first aid kit	59.2%	60.7%	45.6%	59.5%	56.7%
Made sure I/we have rubber gloves	30.8%	33.6%	26.2%	29.8%	30.1%
Made sure I/we have candles and waterproof matches	67.7%	61.7%	44.7%	52.7%	57.1%
Made sure I/we have a waterproof bag for valuables	23.8%	26.2%	16.5%	16.0%	20.6%
Made a list of emergency contact numbers	30.8%	35.5%	19.4%	32.1%	29.7%
Stockpiled water and food for three days	37.7%	45.8%	10.7%	21.4%	29.1%

6.2 Respondents' beliefs about preparing for flooding

Between 60 and 70% of respondents from Grafton, Narrabri and Maitland thought that it was necessary to make preparations for floods (Table 15). A smaller percentage from Albury (48%) thought that it was necessary to do so.

Table 15 Respondents' beliefs about preparing for flooding

Do you believe it is necessary to make preparations for floods?	Location									
	Grafton		Narrabri		Albury		Maitland		Total	
		Column Valid N %		Column Valid N %		Column Valid N %		Column Valid N %		Column Valid N %
	Count	%	Count	%	Count	%	Count	%	Count	%
Yes	88	67.7%	70	66.7%	49	47.6%	80	59.7%	287	60.8%
Not sure	9	6.9%	19	18.1%	27	26.2%	22	16.4%	77	16.3%
No	33	25.4%	16	15.2%	27	26.2%	32	23.9%	108	22.9%
Total	130	100.0%	105	100.0%	103	100.0%	134	100.0%	472	100.0%

Respondents were asked to give a reason as to why they did not think preparation was necessary. By far the majority of respondents stated that they did not think it was necessary to prepare, because they did not believe they were in a flood risk area. The other reason was related to the levees, and eight people across all the towns surveyed indicated that they trusted the levees and therefore felt that they did not need to prepare.

Of those that thought that you should prepare for floods (i.e. answered 'Yes'), 60-70% from Grafton, Narrabri and Albury lived in areas considered more likely to flood. Only 53% of residents in Maitland who answered 'Yes' lived in 'floodable' areas (Table 16). Therefore at least 50% of people from the total sample who think preparation is important, live in areas likely to flood.

Those that didn't know, or did not think preparation for flooding was necessary, tended to live in areas which were less or unlikely to flood. For example 80-90% of residents from Grafton, Albury and Maitland who answered 'No' lived in areas that are considered less or unlikely to flood.

Less than 20% of respondents from Grafton, Albury and Maitland who did not consider preparation was necessary, live in areas that are likely to flood. However, a greater proportion of residents who do not think preparation is necessary, live in areas of Narrabri that are likely flood (38%).

Table 16 Respondents' belief about whether it is necessary to make preparations for floods versus whether they are living in a floodable area

Do you believe it is necessary to make preparations for floods?		Is the area floodable or less likely/unlikely to flood?					
		Likely to flood		Less or unlikely to flood		Total	
		Count	Row Valid N %	Count	Row Valid N %	Count	Row Valid N %
Grafton	Yes	61	69.3%	27	30.7%	88	100.0%
	No	3	9.1%	30	90.9%	33	100.0%
Narrabri	Yes	55	78.6%	15	21.4%	70	100.0%
	No	6	37.5%	10	62.5%	16	100.0%
Albury	Yes	31	63.3%	18	36.7%	49	100.0%
	No	4	14.8%	23	85.2%	27	100.0%
Maitland	Yes	42	52.5%	38	47.5%	80	100.0%
	No	6	18.8%	26	81.3%	32	100.0%
Total	Yes	189	65.9%	98	34.1%	287	100.0%
	No	19	17.6%	89	82.4%	108	100.0%

6.3 Critical awareness

Thinking and talking about flooding is part of what is known as 'critical awareness' and plays an important part of forming an individual's intention to prepare for hazards. All the communities surveyed here fall somewhere in the middle of the range with respect to thinking and talking about hazards (Table 17).

All the communities also fall just under the centre of the scale with respect to getting information on flooding. In particular, Albury residents are the least likely of all the communities to get information on flooding. Standard deviations are typically around or just over '1' indicating some spread in people's opinions about the mean.

Table 17 How concerned respondents are about floods (1=Not at all, 5=A great deal)

	Location														
	Grafton			Narrabri			Albury			Maitland			Total		
	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N
I think about floods	2.72	1.14	116	2.86	.99	99	2.36	1.19	97	2.69	1.13	126	2.66	1.13	438
I talk about floods	2.59	1.05	111	2.66	.92	95	2.12	1.12	86	2.45	1.03	121	2.47	1.05	413
I get information on floods	2.34	1.29	104	2.26	1.21	90	1.43	.93	83	2.09	1.18	114	2.05	1.21	391
I think a flood could pose a threat to my personal safety	2.15	1.30	108	2.05	1.22	91	2.28	1.28	87	2.25	1.32	121	2.18	1.29	407
I think a flood could pose a threat to my property	2.65	1.50	113	2.78	1.30	98	2.54	1.42	89	2.84	1.48	122	2.71	1.43	422

6.4 Intention to seek information and become involved with a local group

Only very low percentage of respondents from Grafton, Narrabri, Albury and Maitland (5% or under) suggested that they were definitely going to either seek information on flood risk, seek information on preparing for floods or become involved with a local flooding-focussed group in the next month or so (Table 18).

The majority of respondents did not have any intentions to undertake any of the activities asked about. Approximately three quarters of respondents from all towns indicated that they were not going to seek information on flood risk or seek information on preparing for floods in the next month or so. Over 80% of respondents from all towns also said that they were not going to become involved with a local group to discuss flood risk.

Table 18 In the next month or so do you intend to: (a) seek information about flood risk (b)seek information on things to do to prepare for a possible flood (c)become involved with a local group to discuss how to reduce flood risk to your community?

		Location									
		Grafton		Narrabri		Albury		Maitland		Total	
		Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Seek information on flood risk to your community	No	93	75.6%	80	79.2%	73	72.3%	96	76.2%	342	75.8%
	Possibly	27	22.0%	21	20.8%	23	22.8%	24	19.0%	95	21.1%
	Definitely	3	2.4%	0	0%	5	5.0%	6	4.8%	14	3.1%
	Total		100.0%		100.0%		100.0%		100.0%		100.0%
Seek information on things to do to prepare for a possible flood	No	90	75.0%	74	74.7%	63	64.9%	91	73.4%	318	72.3%
	Possibly	26	21.7%	22	22.2%	30	30.9%	28	22.6%	106	24.1%
	Definitely	4	3.3%	3	3.0%	4	4.1%	5	4.0%	16	3.6%
	Total	120	100.0%	99	100.0%	97	100.0%	124	100.0%	440	100.0%
Become involved with a local group to discuss how to reduce flood risk	No	101	84.2%	81	85.3%	79	82.3%	104	83.9%	365	83.9%
	Possibly	13	10.8%	13	13.7%	16	16.7%	17	13.7%	59	13.6%
	Definitely	6	5.0%	1	1.1%	1	1.0%	3	2.4%	11	2.5%
	Total	120	100.0%	95	100.0%	96	100.0%	124	100.0%	435	100.0%

6.5 Flood protection provided by a levee

Most respondents in Grafton (96%) and Maitland (93%) indicated that they thought that their communities were protected by a levee (Table 19). The reaction from Albury was mixed, with nearly 40% suggesting that Albury was protected by a levee, a further third indicating that they did not know, and another third saying “No”. The majority of residents from Narrabri who answered the survey (92%) said that Narrabri did not have flood protection from a levee. From these results, it appears that residents in Grafton, Narrabri and Maitland have accurate perceptions about the presence or absence of levees in their towns, however many respondents from Albury seemed confused, and failed to accurately identify the presence of a levee.

When asked whether current levees provided protection from small or big floods, respondents from Grafton were more likely to think they had protection from “big floods” (58%), while respondents from Albury were more likely to think only “small floods” (51%). In actuality, both schemes have the same AEP of 1%. Grafton residents were therefore more likely to overestimate the level of protection afforded by the levee, while Albury residents were more realistic about what protection the levee could provide. Maitland survey respondents were more divided about how their levee system would perform, with 35% thinking the levee would provide protection from “small floods”, 38% protection from “big floods” and 20% protection from “all floods”. Like Grafton, Maitland respondents appear to be overestimating the level of protection afforded by their levee system. Because Narrabri does not have a significant levee system, it was not included in the analysis for this question.

Table 19 Does your community have flood protection provided by a levee, and if "Yes", what level of protection do you think is provided?

	Location									
	Grafton		Narrabri		Albury		Maitland		Total	
	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Yes	125	96.2%	3	2.9%	41	39.4%	121	93.1%	290	61.8%
Not sure	0	.0%	5	4.8%	33	31.7%	7	5.4%	45	9.6%
No	5	3.8%	97	92.4%	30	28.8%	2	1.5%	134	28.6%
Total	130	100.0%	105	100.0%	104	100.0%	130	100.0%	469	100.0%
Level of Protection:										
Small floods	28	23.1%	0	.0%	25	51.0%	43	35.0%	96	32.3%
Big floods	70	57.9%	1	25.0%	8	16.3%	47	38.2%	126	42.4%
All floods	17	14.0%	2	50.0%	4	8.2%	25	20.3%	48	16.2%
Don't know	6	5.0%	1	25.0%	12	24.5%	8	6.5%	27	9.1%
Total	121	100.0%	4	100.0%	49	100.0%	123	100.0%	297	100.0%

6.6 Flood insurance

Respondents were asked whether they were insured against flood damage. In Australia there is no general insurance cover for flooding from a natural disaster. Nearly a third of residents (30%) from all the towns combined thought, incorrectly, that they were insured, with a further 23% unsure as to whether they were insured or not (Table 20). Grafton was the town that had the most accurate perception about insurance with 57% of respondents reporting that they were not covered by flood insurance. In contrast, at the other end of the scale only 24% of residents from Albury indicated that they were not covered by flood insurance with 76% either unsure or claiming that they were covered. Narrabri and Maitland fell somewhere in between with around half of respondents believing that they were not covered by insurance.

In comparison, a telephone survey was conducted in Maitland in 2005, which asked residents the same question. Results were split evenly, with approximately a third of respondents saying "Yes", "No" and "Not sure" when asked whether they were insured against floods (Micromex Research, 2005). This survey reports reasonably similar results, although for this questionnaire a slightly higher proportion of Maitland residents (50%) said that they were not insured against floods than for the telephone-based study.

Table 20 Are you insured against floods?

	Location									
	Grafton		Narrabri		Albury		Maitland		Total	
	Valid N %	Count	Valid N %	Count	Valid N %	Count	Valid N %	Count	Valid N %	Count
Yes	25.6%	32	31.7%	33	35.8%	34	29.9%	38	30.4%	137
Not sure	17.6%	22	16.3%	17	40.0%	38	20.5%	26	22.8%	103
No	56.8%	71	51.9%	54	24.2%	23	49.6%	63	46.8%	211

7.0 FLOOD WARNINGS

7.1 Elements making up the public flood warning system

Respondents were asked to indicate what they recalled about the public flood warning system for their community. People were allowed to tick more than one option (i.e. warning element) for this question, so the results are made up of multiple responses (Table 21).

Albury residents were the most likely to indicate that they did not know what the warning system was for their community (45%). Approximately a quarter of Maitland residents, 12% of Grafton residents and 6% of people from Narrabri did not know what the warning system was in those communities either.

By far the largest type of warning indicated by survey respondents as making up their community's warning system was radio and TV announcements. Between 73% and 95% of residents in Grafton, Narrabri and Maitland indicated that this form of warning was part of the community warning system. Lesser numbers of respondents from Albury indicated that radio and TV formed part of the community warning system.

Door knocking was the second form of warning most often indicated by survey respondents. Around 55% of residents in Grafton and Narrabri indicated that door-knocking formed part of their community's warning system, and 31% of people from Maitland also indicated this. In Albury however, door-knocking was considered by only 14% of people to be a part of their warning system.

Other methods of warning were indicated only in low numbers as parts of a community's warning system – all under 15%.

Table 21 Respondents views of elements that make up the different community's public flood warning systems

	Location				
	Grafton	Narrabri	Albury	Maitland	Total
	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %
Don't know	11.6%	5.7%	45.2%	26.4%	21.8%
Sirens	10.1%	0%	6.7%	1.6%	4.7%
Mobile public address systems	11.6%	2.9%	1.9%	11.6%	7.5%
Flashing lights	3.9%	1.0%	4.8%	3.9%	3.4%
Radio and TV announcements	88.4%	95.2%	40.4%	72.9%	74.9%
Information on the internet	17.8%	14.3%	2.9%	11.6%	12.0%
Door-knocking	54.3%	56.2%	14.4%	31.0%	39.4%
There is no warning system	3.9%	2.9%	15.4%	3.9%	6.2%
Other	3.1%	4.8%	1.0%	3.1%	3.0%

7.2 What respondents would do on hearing a flood warning

Respondents were asked to tick more than one option to indicate what actions they would follow on hearing a flood warning (Table 22). The largest percentage of respondents from all towns suggested that if they heard a flood warning they would listen to either the radio (70-85%) or the TV (52-66%).

About a third of residents in Grafton, Narrabri and Maitland said they would contact their neighbours, with only 17% of residents from Albury indicating this.

Survey respondents from Maitland were most likely to contact SES (45%), followed by Narrabri (39%) and Grafton (33%). Albury residents again were the least likely to contact SES.

A third of Grafton residents suggested that they would stay inside and wait to be told what to do, as did nearly a quarter of Albury residents. Narrabri respondents had the highest percentage for just staying at home full stop (42%).

A reasonable number of respondents from Grafton, Narrabri and Maitland (34-43%) indicated that they would go and check the river, while very few Albury residents (5%) said that they would take this action.

Table 22 On hearing a flood warning what would respondents do?

	Location				
	Grafton	Narrabri	Albury	Maitland	Total
	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %
Don't know	3.9%	1.0%	10.6%	.8%	3.9%
Contact your neighbours	29.5%	36.9%	17.3%	33.8%	29.6%
Contact the local council	10.9%	14.6%	11.5%	22.3%	15.0%
Contact SES	32.6%	38.8%	23.1%	45.4%	35.4%
Contact another emergency service	7.8%	10.7%	8.7%	9.2%	9.0%
Check the internet	14.7%	17.5%	9.6%	13.8%	13.9%
Other (specify)	9.3%	7.8%	6.7%	6.9%	7.7%
Meet at a designated evacuation centre or assembly point	6.2%	2.9%	14.4%	16.2%	10.1%
Stay inside and wait to be told what to do	31.0%	19.4%	24.0%	11.5%	21.5%
Listen to the radio	80.6%	85.4%	70.2%	78.5%	78.8%
Listen to the TV	51.9%	66.0%	53.8%	63.8%	58.8%
Evacuate at once	3.1%	1.0%	9.6%	6.2%	4.9%
Evacuate at a later stage	7.0%	8.7%	8.7%	16.9%	10.5%
Stay at home	31.8%	41.7%	11.5%	22.3%	26.8%
Go and check the river	34.1%	38.8%	4.8%	43.1%	31.1%

7.3 The number that respondents would call for help in a flood

Overall, the responses to the question “What number would you call for help in a flood?”, were fairly evenly spread (Table 23). Respondents from all towns tended either to not know what number they would call (30%) or to prefer to call ‘000’ (26%). Respondents from Albury had the highest proportion of ‘don’t know’ responses (38%).

The SES number (132 500) was cited by 15% of the total respondents as the number they would call for help in a flood. This number was most recognised in Grafton with 24% of respondents there indicating that they would call 132 500 for help in a flood. Between 13% and 19% of residents from Narrabri and Maitland indicated that they would call the SES number, and Albury had the lowest response to this option with only 3% suggesting that they would call the SES for help in a flood. At the time of the survey, three communities (Grafton, Narrabri and Maitland) had been exposed to a Prime television advertisement, which related the SES (132 500) number to ring in an emergency. However Albury residents were not exposed to the campaign until later on and this may account for the low percentage of respondents from Albury identifying the correct number to call.

The local council was also a place that respondents thought they might call for help with flooding – in fact residents from Narrabri indicated that the council was their preferred option by rating it above the other options listed (27%).

In Maitland, a telephone survey was conducted in 2005 that asked the same question. For the telephone survey 67% of people did not know who they would call (compared with 30% for this questionnaire), 26% said they would call ‘000’ (compared with a similar 30% for this questionnaire) and 4% said they would call the correct SES number (compared with 13% for this questionnaire). The differences in the recall of particular numbers may be because the telephone survey was unprompted and asked respondents to recall a number that they had perhaps not memorised, whereas the questionnaire provided options to choose from. Another explanation in the difference however might be the timing of the Prime TV advertising campaign, which occurred before this survey was conducted, and may have raised the profile of the 132 500 number.

Table 23 What number would you call for help in a flood?

What number would you call for help in a flood?	Location									
	Grafton		Narrabri		Albury		Maitland		Total	
	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Don't know	35	29.4%	21	22.3%	38	38.4%	34	30.4%	128	30.2%
000	29	24.4%	12	12.8%	37	37.4%	34	30.4%	112	26.4%
1800 201 000	1	.8%	2	2.1%	1	1.0%	1	.9%	5	1.2%
132 500	28	23.5%	18	19.1%	3	3.0%	14	12.5%	63	14.9%
131 700	0	.0%	0	0%	1	1.0%	0	0%	1	.2%
Local council	14	11.8%	25	26.6%	16	16.2%	15	13.4%	70	16.5%
Other (specify)	12	10.1%	16	17.0%	3	3.0%	14	12.5%	45	10.6%
Total	119	100.0%	94	100.0%	99	100.0%	112	100.0%	424	100.0%

7.4 The organisation respondents would contact for information in a flood

The SES, RTA and Police were all most popular organisations cited by respondents as places that they would contact for information in a flood (Table 24). Around half of respondents from all the towns combined indicated they would contact these organisations for information. Narrabri had the highest percentage of respondents who indicated that they would make contact with the SES (63%) followed by Maitland (61%) and Grafton (54%). Predicted contact with the SES was lowest in Albury (40%).

Table 24 Who would you contact for information in a flood?

	Location									
	Grafton		Narrabri		Albury		Maitland		Total	
	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Don't know	6	4.7%	2	1.9%	14	13.5%	7	5.5%	29	6.2%
Local council	21	16.3%	40	38.5%	24	23.1%	37	28.9%	122	26.2%
SES	69	53.5%	65	62.5%	42	40.4%	78	60.9%	254	54.6%
RTA	83	64.3%	50	48.1%	41	39.4%	57	44.5%	231	49.7%
Police	65	50.4%	62	59.6%	55	52.9%	68	53.1%	250	53.8%
Fire Authority	0	0%	0	0%	5	4.8%	3	2.3%	8	1.7%
Neighbour	8	6.2%	8	7.7%	7	6.7%	12	9.4%	35	7.5%
Other (specify)	11	8.5%	8	7.7%	4	3.8%	10	7.8%	33	7.1%

7.5 Evacuation during a flood

Respondents were asked what action they would take if they were told to evacuate their property during a flood (Table 25). For the option "Go immediately when told", compliance was indicated as being the highest in Albury (71%) and Maitland (69%), but less in Narrabri (50%) and least in Grafton (39%). In terms of actions, Grafton residents were more likely to do nothing, either suggesting they would stay put (20%) or wait for a 'door-knock' to tell them to go (17%).

The Grafton figures are consistent with those of Pfister (2002) who investigated the situation that arose during the 2001 Grafton floods, where only 18% of residents who were surveyed stated that they evacuated their homes in response to warnings. Pfister attributed the poor evacuation rates to several factors including the fact that residents weren't ready to evacuate, that they had little appreciation of the flood threat, that they had no acceptance of the need to evacuate, and they had no understanding of the evacuation strategy. He suggested that community education, outside of flood time is the key to successful evacuation.

When looking at many of the other survey questions, evacuation compliance (or non-compliance) did not appear to link with the presence of an education programme (for example, Maitland has had extensive education but still has low levels of self-reported compliance), demographic factors or hazard understanding. There does, however, seem to

be a link with past experience of flooding. For Grafton and Narrabri (which have a more recent history of flooding) residents were less likely to “go immediately when told” (50% or under). In contrast Albury and Maitland residents, who hadn’t experienced significant flooding in a long time (and thus were not exposed to any normalisation bias), were more likely to “go immediately when told” (around 70%).

Table 25 If you were told to evacuate your property during a flood, would you…?

	Location									
	Grafton		Narrabri		Albury		Maitland		Total	
	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Do nothing - stay put	23	20.0%	13	13.0%	6	6.0%	6	4.5%	48	10.7%
Wait until the water reaches my house and then decide	8	7.0%	12	12.0%	5	5.0%	5	3.8%	30	6.7%
Go immediately when told	45	39.1%	50	50.0%	71	71.0%	91	68.9%	257	57.5%
Wait for 'door-knock'	20	17.4%	13	13.0%	4	4.0%	10	7.6%	47	10.5%
Use the phone to call for help to evacuate	4	3.5%	2	2.0%	2	2.0%	4	3.0%	12	2.7%
Don't know	1	.9%	3	3.0%	7	7.0%	4	3.0%	15	3.4%
Other (specify)	14	12.2%	7	7.0%	5	5.0%	12	9.1%	38	8.5%

7.6 Flooded areas of road

Respondents were asked two questions about what they would do when encountering stretches of road which had been flooded. First, they were asked if they came across a flooded area of road with NO ‘road closed’ sign what would they do? Between 51% and 62% of respondents from all the towns reported that they would turn back, with Maitland respondents indicating the highest level of compliance at 62% and Narrabri the lowest at 51% (Table 26). In contrast to this figure, 18-27% reported that they would continue on with care (Albury having the highest percentage at 27% and Maitland the lowest at 12%) and 12% or less would wait for assistance. Of the over 100 respondents who said they would continue on, males were more likely to continue (28%) compared with females (20%)(Table 27). Younger people were also more likely to continue on (18-24) than those in the older age groups (Table 28).

A second question asked respondents what they would do if they came across a flooded section of road with a ‘road closed’ sign. A very high percentage (over 90%) of residents from all towns said that they would go back.

Table 26 Flooded areas of road – what respondents would do when encountering this situation

		Location									
		Grafton		Narrabri		Albury		Maitland		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
Flooded area of road not marked with a 'road closed' sign - would you:	Continue on with care	25	19.5%	28	26.9%	27	27.3%	24	17.9%	104	22.4%
	Go back	70	54.7%	53	51.0%	52	52.5%	83	61.9%	258	55.5%
	Wait for assistance	15	11.7%	1	1.0%	7	7.1%	10	7.5%	33	7.1%
	Don't know	3	2.3%	1	1.0%	5	5.1%	2	1.5%	11	2.4%
	Other (specify)	15	11.7%	21	20.2%	8	8.1%	15	11.2%	59	12.7%
	Total	128	100.0%	104	100.0%	99	100.0%	134	100.0%	465	100.0%
If there was a 'road closed' sign, would you:	Continue on with care	3	2.3%	0	0%	1	1.0%	1	.7%	5	1.1%
	Go back	117	91.4%	102	96.2%	96	93.2%	128	95.5%	443	94.1%
	Wait for assistance	5	3.9%	1	.9%	3	2.9%	4	3.0%	13	2.8%
	Don't know	1	.8%	0	0%	1	1.0%	0	0%	2	.4%
	Other (specify)	2	1.6%	3	2.8%	2	1.9%	1	.7%	8	1.7%
	Total	128	100.0%	106	100.0%	103	100.0%	134	100.0%	471	100.0%

Table 27 Flooded areas of road – what respondents would do when encountering this situation (breakdown by gender)

		Gender					
		Male		Female		Total	
		Count	%	Count	%	Count	%
Flooded area of road not marked with a 'road closed' sign - would you:	Continue on with care	56	27.5%	44	19.6%	100	23.3%
	Go back	106	52.0%	129	57.3%	235	54.8%
	Wait for assistance	13	6.4%	17	7.6%	30	7.0%
	Don't know	2	1.0%	7	3.1%	9	2.1%
	Other (specify)	27	13.2%	28	12.4%	55	12.8%
	Total	204	100.0%	225	100.0%	429	100.0%
If there was a 'road closed' sign, would you:	Continue on with care	3	1.4%	2	.9%	5	1.2%
	Go back	190	91.8%	220	96.9%	410	94.5%
	Wait for assistance	7	3.4%	3	1.3%	10	2.3%
	Don't know	1	.5%	0	0%	1	.2%
	Other (specify)	6	2.9%	2	.9%	8	1.8%
	Total	207	100.0%	227	100.0%	434	100.0%

Table 28 Flooded areas of road – what respondents would do when encountering this situation (breakdown by age)

		Age							
		18-24 years		25-44 years		45-64 years		65 years and over	
		Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
Flooded area of road not marked with a 'road closed' sign - would you:	Continue on with care	7	38.9%	30	25.4%	43	23.9%	20	15.5%
	Go back	7	38.9%	65	55.1%	95	52.8%	81	62.8%
	Wait for assistance	0	0%	5	4.2%	10	5.6%	15	11.6%
	Don't know	0	0%	6	5.1%	3	1.7%	1	.8%
	Other (specify)	4	22.2%	12	10.2%	29	16.1%	12	9.3%
	Total	18	100.0%	118	100.0%	180	100.0%	129	100.0%
If there was a 'road closed' sign, would you:	Continue on with care	0	.0%	0	0%	3	1.6%	2	1.6%
	Go back	18	100.0%	119	98.3%	170	92.9%	118	92.2%
	Wait for assistance	0	0%	1	.8%	4	2.2%	5	3.9%
	Don't know	0	0%	0	0%	1	.5%	1	.8%
	Other (specify)	0	0%	1	.8%	5	2.7%	2	1.6%
	Total	18	100.0%	121	100.0%	183	100.0%	128	100.0%

8.0 PUBLIC EDUCATION

8.1 Had respondents seen any flood information for their local river

A similar percentage (59-62%) of respondents from Grafton, Narrabri and Maitland had seen some form of flood information for their local river (Table 29). Only a quarter of Albury residents stated that they had seen information on flooding for their local river.

The information seen by respondents came in a variety of formats (e.g. brochures, signage, flood heights/depth indicators, historical information, newspaper, radio, website, etc).

In Grafton, newspaper and radio were the two forms of media that residents had most often reported as sources of information about their local river. The flood depth indicators around the town were also noted as a form of information that residents had noticed. Only four people noted having seen any flood brochures.

In Narrabri, respondents tended to draw from their experience more, with a number of people noting that their flood information came from experience of past floods. Again the radio, newspaper and TV were referred to as popular media giving information about their local river. Narrabri residents quoted the Internet as a source of information more often than those from other towns

Only a small number of respondents from Albury noted down what information they had seen about their local river – this was mostly on TV, in the newspaper or on the radio.

Maitland had the most diverse response by far in terms of information that respondents had seen. Many alluded to historical information as part of open days, displays, movies, meetings and in the paper. Brochures were also noted as part of the information which residents had seen, as were flood level indicators and associated signage. Interestingly, despite this diversity, few respondents from Maitland referred to the radio.

Table 29 Had respondents seen any flood information for their local river

	Location									
	Grafton		Narrabri		Albury		Maitland		Total	
	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %
No	35	26.9%	26	24.5%	62	60.2%	35	26.7%	158	33.6%
Not sure	18	13.8%	16	15.1%	15	14.6%	15	11.5%	64	13.6%
Yes	77	59.2%	64	60.4%	26	25.2%	81	61.8%	248	52.8%
Total	130	100.0%	106	100.0%	103	100.0%	131	100.0%	470	100.0%

8.2 Places information was received from about preparing for floods

A significant percentage of Albury residents said they had not received any information about preparing for floods (78%) (Table 30). In addition, 49% of Maitland residents, 35% of respondents from Narrabri and 30% of Grafton residents had also not received any information about preparing for floods.

In Narrabri and Grafton the information that was received came predominantly from the SES (over 50%), radio (over 50%), TV (around 35%), the local council (over 35%) and newspapers or magazines. In Maitland a similar trend was present but with smaller percentages for each type of media. No dominant method of information receipt was evident for Albury.

Table 30 Have you heard or received any information about preparing for floods from the following places?

	Location				
	Grafton	Narrabri	Albury	Maitland	Total
	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %
I haven't heard of received any information about floods	29.5%	35.0%	77.5%	48.5%	46.5%
Newspapers or magazines	37.9%	26.2%	10.8%	29.2%	27.0%
Meetings, seminars or workshops	6.8%	3.9%	1.0%	7.7%	5.1%
Businesses	6.1%	3.9%	0%	3.1%	3.4%
School hand-outs	1.5%	1.9%	1.0%	3.8%	2.1%
Friends or relatives	17.4%	18.4%	4.9%	12.3%	13.5%
Service organisations	2.3%	2.9%	1.0%	1.5%	1.9%
Neighbourhood Watch groups	3.0%	0%	2.0%	2.3%	1.9%
Where you work	9.1%	11.7%	2.9%	1.5%	6.2%
Posters or postcards	1.5%	.0%	0%	5.4%	1.9%
Telephone book/street directory	5.3%	1.0%	2.0%	.8%	2.4%
Local council	38.6%	35.9%	10.8%	33.1%	30.4%
My insurance company/agent	1.5%	1.0%	0%	2.3%	1.3%
Flood warden	3.0%	12.6%	2.9%	2.3%	4.9%
Internet	5.3%	4.9%	3.9%	3.1%	4.3%
Email	.8%	0%	1.0%	.8%	.6%
SMS (Text)	.8%	0%	1.0%	.8%	.6%
Other (specify)	6.1%	2.9%	2.0%	5.4%	4.3%
SES	55.3%	51.5%	8.8%	33.1%	38.1%
Federal government	2.3%	2.9%	1.0%	6.2%	3.2%
Fire service	2.3%	1.0%	4.9%	3.1%	2.8%
Police	9.1%	7.8%	5.9%	4.6%	6.9%
Bureau of Meteorology	17.4%	16.5%	6.9%	9.2%	12.6%
Television	34.1%	36.9%	14.7%	31.5%	29.8%
Radio	50.0%	51.5%	12.7%	27.7%	36.0%

8.3 Whether respondents had asked any particular people, groups or organisations for information on how to get ready for floods

A large proportion (92%) of respondents in Albury hadn't asked anyone about information on how to get ready for floods (Table 31). Of those that had asked, friends were indicated as the most likely source of information (5%). Maitland and Grafton also had high percentages of people who reported not having asked anyone for information about preparing for floods (75% and 65% respectively). In those towns, friends, neighbours, the local council and the SES were the people or organisations where the information was most likely to come from.

Over half of the surveyed residents from Narrabri (56%) indicated that they hadn't asked anyone how to get ready for floods. This was the lowest percentage out of all the towns, indicating that Narrabri residents were more likely to seek information than people from the other towns surveyed. The places that residents sought information from included workplace, friends, neighbours, relatives, the local council and SES.

Table 31 Have you asked any of the following people, groups or organisations for information on how to get ready for floods?

	Location				
	Grafton	Narrabri	Albury	Maitland	Total
	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %
I haven't asked anyone how to get ready for floods	65.2%	55.7%	92.2%	75.4%	71.8%
Bureau of Meteorology	1.5%	1.9%	0%	3.1%	1.7%
Business establishments	.8%	0%	0%	0%	.2%
My workplace	4.5%	8.5%	2.9%	.8%	4.0%
My child's school	1.5%	0%	.0%	0%	.4%
... Other (specify)	5.3%	10.4%	1.0%	3.1%	4.9%
Friends	15.9%	18.9%	4.9%	9.2%	12.3%
Neighbours	14.4%	17.9%	1.0%	11.5%	11.5%
Relatives	7.6%	14.2%	1.9%	8.5%	8.1%
Local council	9.8%	10.4%	1.9%	10.8%	8.5%
SES	15.2%	13.2%	1.9%	11.5%	10.8%
Federal government	.8%	0%	0%	2.3%	.8%
Police	2.3%	2.8%	1.9%	1.5%	2.1%
Fire Service	1.5%	.9%	1.0%	1.5%	1.3%

8.4 Preferences for getting information about preparing for floods

Respondents were asked how they preferred to get information on preparing their household or business for floods. The preferred ways of receiving information were similar across all of the four communities (Table 32). They included: brochures received in the mail (70%); TV advertisements (42%); radio advertisements (36%); and fridge magnets and newspaper/magazines (32-33%).

Table 32 How would you prefer to get information on how to prepare your household/business for floods?

	Location				
	Grafton	Narrabri	Albury	Maitland	Total
	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %
Brochure received in the mail	73.8%	62.9%	76.7%	67.9%	70.4%
Public meeting	7.7%	7.6%	14.6%	15.3%	11.3%
Other (specify)	3.1%	5.7%	1.9%	5.3%	4.1%
Brochure picked up	6.9%	3.8%	5.8%	10.7%	7.0%
Radio advertisement	40.0%	40.0%	32.0%	32.1%	36.0%
TV advertisement	37.7%	37.1%	52.4%	43.5%	42.4%
Fridge magnet received in the mail	24.6%	34.3%	37.9%	34.4%	32.4%
Home visit by SES	12.3%	17.1%	12.6%	19.1%	15.4%
Newspaper or magazine advertisement	33.8%	30.5%	36.9%	31.3%	33.0%
Community display	16.2%	14.3%	14.6%	26.7%	18.3%
Internet	7.7%	10.5%	11.7%	6.1%	8.7%

8.5 Preferences for receiving information about current flooding

Respondents were asked about how they preferred to receive information at the time of a flood (Table 33). Radio was the preferred option for respondents from all towns (92%), with Narrabri rating it the most preferred (96%). TV was the second preferred option (73%), followed by door-knocking (around 50% for all the towns surveyed).

In Albury a significant number of respondents also noted the siren (37%) as a preferred way of receiving information about flooding, while in Narrabri the use of a flood warden (34%) was also regarded as useful.

Table 33 In a flood, how would you prefer to receive information about that flood?

	Location				
	Grafton	Narrabri	Albury	Maitland	Total
	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %	Column Valid N %
Radio	95.5%	96.3%	88.5%	87.4%	91.8%
SMS (Text)	8.3%	12.1%	15.4%	9.6%	11.1%
Don't know	0%	0%	0%	.7%	.2%
Other (specify)	1.5%	0%	1.9%	3.7%	1.9%
TV	72.0%	67.3%	71.2%	79.3%	72.8%
Door-knocking	50.0%	46.7%	46.2%	49.6%	48.3%
Mobile public address	22.0%	13.1%	29.8%	32.6%	24.7%
Internet	12.9%	17.8%	12.5%	11.9%	13.6%
Email	2.3%	5.6%	3.8%	2.2%	3.3%
Siren	15.2%	7.5%	36.5%	20.7%	19.7%
Flood Warden	18.2%	33.6%	18.3%	25.2%	23.6%
Telephone	22.0%	31.8%	28.8%	25.9%	26.8%

8.6 Responsibility for flooding

Respondents from all the towns surveyed considered local government (local council) and state government (SES) to have the most responsibility for protecting people from floods. In general, figures for the local council were slightly higher, indicating that all four communities think the local council has the most responsibility (Table 34). Individual responsibility comes third in terms of ranking, before federal government.

Table 34 Please indicate on the scale, whose responsibility you believe it is to protect us from flood (1=Not at all, 5=A great deal)

	Location														
	Grafton			Narrabri			Albury			Maitland			Total		
	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N
Federal Government	3.31	1.40	100	3.04	1.44	83	3.00	1.43	88	3.65	1.40	102	3.27	1.43	373
State Government (SES)	4.12	1.03	113	4.05	1.19	93	4.01	1.14	95	4.31	.89	122	4.14	1.06	423
Government (local council)	4.37	.81	115	4.10	1.21	102	4.16	.98	100	4.33	1.01	122	4.25	1.01	439
Individual households (mine)	3.92	1.31	104	3.98	1.16	89	3.52	1.33	88	3.91	1.30	109	3.84	1.29	390

8.7 Belief in preparing for flooding

Narrabri respondents agreed most with the statement, "There is no use preparing for floods as we can't do much anyway" (Table 35). Even so, they only moderately agreed, because it is only positioned halfway along the scale (at 2.28). Grafton, Albury and Maitland all agreed with this statement to a lesser degree.

Table 35 Please indicate on the scale, how much you agree with the following statement, "There is no use preparing for floods as we can't do much anyway" (1=Not at all, 5=A great deal)

	Location														
	Grafton			Narrabri			Albury			Maitland			Total		
	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N
There is no use preparing for floods as we can't do much anyway	2.05	1.44	127	2.28	1.50	105	1.79	1.09	101	2.12	1.46	129	2.06	1.40	462

9.0 HAZARD COGNITIONS – THE EXTENT TO WHICH PEOPLE THINK ABOUT AND DISCUSS HAZARDS

9.1 Barriers to flood preparation

In general, barriers to prevent preparing for floods were considered to be only low to moderate. When the scores from all the towns were considered, a 'lack of knowledge or information' was considered to be the greatest barrier (Table 36).

In Narrabri 'time to prepare' was considered the greatest barrier, followed by the 'need for co-operation with others'. However these barriers were only considered 'moderate' at best receiving a score of around 2.5 (where 1=not at all and 5=a great deal). All other towns reported a 'lack of knowledge or information' as their greatest barrier with Albury giving it the highest score (3.6).

Table 36 To what extent might each of the following prevent you from preparing for floods? (1=Not at all, 5=A great deal)

	Location														
	Grafton			Narrabri			Albury			Maitland			Total		
	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N
Cost	1.98	1.31	104	2.01	1.24	92	2.20	1.23	87	2.31	1.45	107	2.13	1.32	390
Skill required to prepare	2.14	1.39	103	1.99	1.18	90	2.17	1.20	84	2.22	1.35	103	2.13	1.29	380
Time to prepare	2.20	1.23	101	2.58	1.09	90	2.44	1.30	85	2.61	1.39	108	2.46	1.27	384
Other things to think about	2.02	1.05	97	2.25	1.30	88	2.51	1.35	86	2.37	1.30	100	2.28	1.26	371
Need for co-operation with others	2.33	1.35	103	2.49	1.34	88	2.16	1.19	86	2.63	1.45	105	2.41	1.35	382
Lack of knowledge or information	2.34	1.45	104	2.33	1.29	89	3.56	1.40	94	2.83	1.48	108	2.76	1.49	395

9.2 Outcome expectancy and level of concern

Respondents were asked a series of questions which investigated their outcome expectancies and concerns about flooding (Table 37). The low scores gained for the questions asked (around 2 or under) indicate that most respondents have a moderate outcome expectancy (i.e. they believe floods are moderately worth preparing for), and that floods are of moderate concern.

Table 37 To what extent do you believe that: (1=Not at all, 5=A great deal)

	Location														
	Grafton			Narrabri			Albury			Maitland			Total		
	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N
Floods are too destructive to bother preparing for	1.49	1.03	104	1.84	1.21	94	1.60	.94	98	1.73	1.19	120	1.67	1.10	416
A serious flood is unlikely to occur during lifetime	2.07	1.53	107	2.00	1.42	93	2.57	1.33	101	2.45	1.52	121	2.28	1.47	422
Unnecessary to prepare as assistance will be provided	1.81	1.30	110	1.76	1.19	96	1.79	1.06	99	1.75	1.11	118	1.78	1.16	423
Floods are not of concern	1.95	1.48	109	1.98	1.39	93	2.24	1.43	100	2.07	1.43	119	2.06	1.43	421

9.3 Sense of community

The scores of the respondents across the four communities indicate that residents feel a part of the community to a moderate or high degree, are interested in the community and that they share values and beliefs with other community members (Table 38). Narrabri respondents appear to show a slightly greater sense of community in comparison to the other towns.

Table 38 Residents' sense of community: Please use the scale to indicate how much each statement applies/doesn't apply to you (1=Doesn't Apply, 5=Applies strongly)

	Location														
	Grafton			Narrabri			Albury			Maitland			Total		
	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N
I feel a part of this community	3.92	1.16	123	3.97	1.10	104	3.59	1.23	100	3.80	1.14	125	3.83	1.16	452
I am satisfied living in this community	4.16	1.02	126	4.10	1.07	102	4.04	.99	99	4.00	1.07	124	4.08	1.03	451
I am a useful member of this community	3.73	1.16	120	3.89	1.07	100	3.68	1.07	98	3.48	1.24	120	3.69	1.15	438
I have the same values and beliefs as my neighbours	3.50	1.27	119	3.70	1.19	102	3.24	1.12	97	3.34	1.31	121	3.44	1.24	439
I feel I don't belong in this community	1.42	.93	110	1.41	.94	93	1.58	1.07	100	1.58	1.03	116	1.50	1.00	419
I am interested in knowing what goes on in this community	3.97	1.17	120	4.19	1.00	103	4.02	.95	100	3.80	1.18	121	3.99	1.09	444
I would be happy to leave this community	1.85	1.14	111	1.89	1.16	93	1.96	1.19	99	1.92	1.18	113	1.90	1.16	416
I know my neighbours and/or other community members	3.92	1.23	123	4.24	.93	104	3.66	1.12	100	3.87	1.09	123	3.92	1.12	450
I have no active involvement in this community	2.21	1.38	117	1.88	1.14	93	2.00	1.12	101	2.33	1.39	120	2.12	1.29	431

9.4 Self efficacy

Self efficacy is the idea that one has control over future life events. It is often also referred to as 'internal locus of control'. Respondents from all of the towns surveyed appear to have moderate to moderately-high level of self-efficacy (Table 39).

Table 39 Residents' self efficacy: Please use the scale to indicate how much each statement applies/doesn't apply to you: (1=Doesn't Apply, 5=Applies strongly)

	Location														
	Grafton			Narrabri			Albury			Maitland			Total		
	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N	Mean	Std Dev	Valid N
I feel I have control over the things that happen in my life and in the community	3.51	1.17	118	3.53	1.03	103	3.03	1.11	100	3.26	1.08	122	3.34	1.11	443
There is no way I can solve some of the problems I have by myself	2.73	1.32	118	2.52	1.21	100	2.59	1.18	101	2.72	1.23	123	2.65	1.24	442
I can't do much to change what happens in my life or in the community	2.55	1.22	121	2.26	1.14	99	2.19	.98	101	2.33	1.14	122	2.34	1.13	443
Somehow problems in my life usually solve themselves	2.96	1.27	121	2.61	1.13	99	2.51	1.11	101	2.51	1.12	121	2.66	1.18	442

10.0 STRUCTURAL INFORMATION ABOUT RESPONDENTS' PROPERTY

10.1 Details about building structure

For the questionnaire, several questions were asked about the structure of respondents' houses. In general it was found that:

- Houses found in most of the towns tended to be one storey high, with fewer two storey houses.
- Narrabri had the greatest percentage of houses raised above ground level with 81% of respondents reporting that their houses were raised (Table 40). This is more than in Grafton and Maitland (both 73%) and Albury (48%).

Table 40 Is your house raised above ground level?

		Location									
		Grafton		Narrabri		Albury		Maitland		Total	
		Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count	Column Valid N %	Count
Is your house raised above ground level?	Yes	73.2%	93	80.8%	84	47.9%	46	73.1%	95	69.6%	318
	Not sure	2.4%	3	3.8%	4	3.1%	3	.8%	1	2.4%	11
	No	24.4%	31	15.4%	16	49.0%	47	26.2%	34	28.0%	128

11.0 CONCLUSIONS

A survey of residents' attitudes and understanding of flood warnings and management was conducted in the towns of Grafton, Narrabri, Albury and Maitland in November 2005. A total of 2000 questionnaires were delivered directly to houses in all four areas, with an overall return rate of 25%. The questionnaire included questions on: awareness, risk perception, previous exposure to flooding, information received concerning preparedness activities, information sought for preparedness purposes and the extent to which people engaged or plan to engage in preparedness activities. Analysis of the results shows that:

- Flooding is perceived as the most likely future hazard by the vast majority of residents from all four towns, with over 85% of respondents indicating that flooding was a natural disaster likely to affect their community at some point, and nearly half (49%) expecting a flood sometime within the next 5 years.
- In terms of previous experience, 59% of respondents had been affected by a flood in the past, with a greater percentage of Narrabri residents experiencing floods (82%), than people from Grafton (71%), Maitland (45%) or Albury (35%).
- Levels of household preparedness for flooding are varied. A reasonable number of respondents reported having already collected some common household items such as torches (82%), batteries (61%), candles/matches (57%), first aid kits (57%) and portable radios (55%). However a much smaller percentage of respondents had carried out other preparedness measures.
- Despite significant experience of past flooding, and a moderate understanding of the flood risk, there are still only moderate levels of concern amongst community members.
- Three quarters of residents believe it is necessary to prepare for floods, but have only moderate personal concern of the flood risk (i.e. 'flooding won't happen to me'). With lower levels of personal concern, people are less likely to take personal action and to make actual preparations for themselves or their families. This highlights the need for individuals to personalise the risk. Even if they think there is a need for community as a whole to prepare, they are less likely to become prepared themselves if the risk isn't personalised.
- Lower levels of personal concern also restrict people from seeking information about risk, and getting involved in community groups, both of which may ultimately help address risk and enhance personal preparedness.
- In general, the barriers which may prevent people preparing for floods were considered to be only low to moderate. When the scores from all the towns were considered, a 'lack of knowledge or information' was considered to be the greatest barrier, but this barrier was still only present at moderate levels.

- Transfer of responsibility may contribute to the lack of preparedness. Respondents may trust that there is effective warning system in place and believe that they do not need to prepare as the warning system will save them. This has been seen elsewhere (Ballantyne, 2000) and complicates building a warning-compliant community. Strategies such as greater community engagement and participation can help overcome this problem (e.g. Betts, 2003).
- Respondents had high levels of knowledge of the warning system. Only 5% said that they did not know about the warning system and 95% of respondents stated that they were familiar with radio and TV announcements as part of the warning system). However low levels of warning compliance have been seen in the past with actual floods (e.g. Grafton). According to Drabek (1986), when a population is adequately warned prior to a natural disaster approximately 50% of that population will evacuate, although actual evacuation rates will vary between different events and from place to place during the same event (Baker, 1991). The variation in evacuation rates is due to a number of factors including the amount of perceived risk, understanding of the warning, whether a warning was received, past experience with or knowledge of the hazard, and severity of the threat (Baker, 1991, Aguirre, 1991, Riad *et al*, 1999). The highest evacuation rates occur when the individuals feel personally at risk and understand that the evacuation warnings apply to them (Baker, 1991).
- When asked the question “What number would you call for help in a flood?”, respondents from all towns either did not know what number they would call (30%) or preferred to call ‘000’ (26%). The SES number (132 500) was cited by 15% of the total respondents as the number they would call for help in a flood. This number was most recognised in Grafton with 24% of respondents there indicating that they would call 132 500 for help in a flood. Between 13% and 19% of residents from Narrabri and Maitland indicated that they would call the SES number, and Albury had the lowest response to this option with only 3% suggesting that they would call the SES for help in a flood. At the time of the survey, three communities (Grafton, Narrabri and Maitland) had been exposed to a Prime television advertisement, which related the SES (132 500) number to ring in an emergency. However Albury residents were not exposed to the campaign until later on and this may account for the low percentage of respondents from Albury identifying the correct number to call.
- Levels of knowledge about the presence of levees and the protection provided by them for flooding were variable. Grafton, Narrabri and Maitland residents had accurate perceptions about the presence or absence of levees in their towns. However, many respondents from Albury were confused about whether a levee was present there or not. In addition, of those that knew of the existence of current levees, there were varied perceptions about the effectiveness of those systems. Grafton and Maitland respondents were more likely to overestimate the level of flood protection afforded by levees, compared with Albury residents who tended to be more realistic about the level of protection their levee might provide.

- Respondents were asked whether they were insured against flood damage. Nearly a third of residents (30%) from all the towns combined thought, incorrectly, that they were insured for flood damage, with a further 23% unsure as to whether they were insured or not.
- The survey shows that levels of community participation in reducing flood risk are currently low. To create a well-prepared and resilient community that understands its hazards and is prepared to deal with them, a number of stages of intervention have been identified (Paton and Johnston 2001 and Paton et al. 2005). Paton et al. (2005) outlines a three-stage process, starting with (1) motivating people to prepare; then (2) facilitating the formation of intentions, and then (3) promoting the conversion of intentions to preparedness. It has been found that no one strategy will bring about change at all stages. There is a need to look at different strategies to encourage more community buy-in and participation in the process of preparing for flood hazards. Simple hazard education (i.e. telling the public about flood risk) is not going to increase levels of preparedness, as levels of knowledge about the hazard are already high. Alternative strategies are required that seek to engage and involve individuals in the process (and help personalise the risk), rather than simply disseminate information. To ensure that education and community engagement initiatives are effective, there is also a need for the continual monitoring and evaluation of future programs. It is only through this that gaps can be identified and the successful elements of a program can be replicated.

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APPENDIX 1 COPY OF THE QUESTIONNAIRE SENT TO ALL TOWNS
(MAITLAND VERSION)

Maitland Flooding Survey:

Involving the community in emergency response preparedness



Central Queensland
UNIVERSITY



Institute of
**GEOLOGICAL
& NUCLEAR
SCIENCES**
Limited

FLOOD SURVEY Research Information Sheet

This research is intended to assess factors that influence how and why people make decisions about preparing or not preparing for natural disaster consequences such as floods. Preparing is seen as an important factor in assisting communities to safeguard their well-being and to minimise disruption (e.g., damage to homes, loss of work) should a flood occur. This research is being undertaken to assess levels of preparedness and the household and community factors that influence levels of preparedness. The survey includes questions that have been identified as influencing the effectiveness of public information campaigns designed to enhance preparedness for natural hazards.

The outcomes of this research will be used by New South Wales State Emergency Service (SES) to enhance the effectiveness of public information programmes, enhance household preparedness for floods, and help ensure that the needs of the community are met with respect to emergency management for flooding.

To collect information on understanding and preparedness for flooding, surveys are being distributed to a random sample of 500 households in your community. Your participation in this survey will help ensure that future public information campaigns can be targeted to meet the needs of your community.

A report summarising the findings of this survey will be available through the local State Emergency Service office, provided to the local newspaper for publication and will additionally be made available on the Institute of Geological and Nuclear Sciences (<http://www.gns.cri.nz>) and Central Queensland University (<http://www.cqu.edu.au>) web pages. To meet our institutional and professional ethical obligations, the data will be stored for five years in a locked storage area, and all raw data will then be destroyed at the end of that period.

Your participation in this study is entirely voluntary, and you may elect to refuse to answer any question on the survey or choose to withdraw from the study at any time (i.e., not fill out and/or choose not to return the survey). The survey does not ask for any identifying information; the researchers will not know your identity. As a result, there is no way in which your responses will be identifiable in any research output including conference presentations and published research reports in academic and professional journals.

Should you wish to find out any additional information regarding this study, please do not hesitate to contact any of the research team:-

Julia Becker, Institute of Geological and Nuclear Sciences (j.becker@gns.cri.nz) or
Phil Campbell, State Emergency Service (philip.campbell@ses.nsw.gov.au); 02-4224-2261) or
Prof Kevin Ronan, Central Queensland University (k.ronan@cqu.edu.au; 07-4930-6746).

Additionally, please contact Central Queensland University's Office of Research (Tel 07 4923 2607) should there be any concerns about the nature and/or conduct of this research project.

Your return of the enclosed survey will be taken as indicative of your having read the information sheet and of your agreement to participate in this study

**The first section of this questionnaire asks about
which natural disasters you think are important.**

1. Which do you believe are the two most likely natural disasters that could affect your community? (Tick only two)

- ☐₁ Flood
- ☐₂ Thunderstorm with high winds and/or hail
- ☐₃ Windstorm
- ☐₄ Bushfire
- ☐₅ Earthquake
- ☐₆ Tsunami
- ☐₇ Other (please specify_____)

2. Have you ever been affected by any of the following events? (Tick all that apply):

- ☐₁ Flood
- ☐₂ Thunderstorm with high winds and/or hail
- ☐₃ Windstorm
- ☐₄ Bushfire
- ☐₅ Earthquake
- ☐₆ Tsunami
- ☐₇ Other (please specify_____)
- ☐₈ No events have affected me (If “No events”, go to Question 3)

If you have been affected, to what extent were you affected? (considering property damage, injuries and financial impact). Please tick the one number you feel best represents this damage in each row, on the scale from 1 to 10.

	Little impact ←————→ Severe impact									
	1	2	3	4	5	6	7	8	9	10
Flood	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇	<input type="checkbox"/> ₈	<input type="checkbox"/> ₉	<input type="checkbox"/> ₁₀
Thunderstorm with high winds and/or hail	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇	<input type="checkbox"/> ₈	<input type="checkbox"/> ₉	<input type="checkbox"/> ₁₀
Windstorm	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇	<input type="checkbox"/> ₈	<input type="checkbox"/> ₉	<input type="checkbox"/> ₁₀
Bushfire	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇	<input type="checkbox"/> ₈	<input type="checkbox"/> ₉	<input type="checkbox"/> ₁₀
Earthquake	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇	<input type="checkbox"/> ₈	<input type="checkbox"/> ₉	<input type="checkbox"/> ₁₀
Tsunami	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇	<input type="checkbox"/> ₈	<input type="checkbox"/> ₉	<input type="checkbox"/> ₁₀
Other (specify_____)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆	<input type="checkbox"/> ₇	<input type="checkbox"/> ₈	<input type="checkbox"/> ₉	<input type="checkbox"/> ₁₀

3. When do you think that each of these disasters is next likely to affect your community? (Tick one for each disaster)

Flood

- ☐₁ Within the next year
- ☐₂ Within the next 5 years
- ☐₃ Within the next 20 years
- ☐₄ Within the next 50 years
- ☐₅ In over 50 years
- ☐₆ Never

Thunderstorm with high winds and/or hail

- ☐₁ Within the next year
- ☐₂ Within the next 5 years
- ☐₃ Within the next 20 years
- ☐₄ Within the next 50 years
- ☐₅ In over 50 years
- ☐₆ Never

Windstorm

- ☐₁ Within the next year
- ☐₂ Within the next 5 years
- ☐₃ Within the next 20 years
- ☐₄ Within the next 50 years
- ☐₅ In over 50 years
- ☐₆ Never

Bushfire

- ☐₁ Within the next year
- ☐₂ Within the next 5 years
- ☐₃ Within the next 20 years
- ☐₄ Within the next 50 years
- ☐₅ In over 50 years
- ☐₆ Never

Earthquakes

- ☐₁ Within the next year
- ☐₂ Within the next 5 years
- ☐₃ Within the next 20 years
- ☐₄ Within the next 50 years
- ☐₅ In over 50 years
- ☐₆ Never

Tsunami

- ☐₁ Within the next year
- ☐₂ Within the next 5 years
- ☐₃ Within the next 20 years
- ☐₄ Within the next 50 years
- ☐₅ In over 50 years
- ☐₆ Never

The following questions are included to help us find out what you think about floods.

4. When was the last time your community was flooded (i.e. some houses or businesses in your community were flooded)? (Tick only one)

- ☐₁ Never
- ☐₂ In the last year
- ☐₃ In the last 2 years
- ☐₄ In the last 10 years
- ☐₅ In the last 50 years
- ☐₆ More than 50 years ago
- ☐₇ Don't know

5. **When was the last time that the house where you live was flooded? (Tick only one)**

- ☐₁ Never
☐₂ In the last year
☐₃ In the last 2 years
☐₄ In the last 10 years
☐₅ In the last 50 years
☐₆ More then 50 years ago
☐₇ Don't know

6. **How concerned are you about floods? (Tick one in each row)**

	<div> <div>Not at all</div> <div> <div>(Scale)</div> <div>↔</div> </div> <div>A great deal</div> </div>				
I think about floods	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I talk about floods	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I get information on floods	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I think a flood could pose a threat to my personal safety	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I think a flood could pose a threat to my property	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

7. **Do you believe it is necessary to make preparations for floods that may affect you and your household in the future? (Tick only one)**

- ☐₁ Yes
☐₂ Not sure
☐₃ No
 If "No", why not? _____

8. **Have you seen any flood information for your local river(s)? (Tick only one)**

- ☐₁ No
☐₂ Not sure
☐₃ Yes
 If "Yes", what was this information?

9. In the next month or so, do you intend to: (Tick one in each row)

	No	Possibly	Definitely
Seek information on flood risk to your community	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
Seek information on things to do to prepare for a possible flood	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
Become involved with a local group to discuss how to reduce flood risk to your community	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃

The following set of questions asks about flood protection and flood warnings.

10. Does your community have flood protection provided by a levee? (Tick only one)

- ☐₁ Yes
☐₂ Not sure
☐₃ No **(If 'No', go to Question 11)**

If "Yes", what level of protection do you think is provided by this levee? (Tick only one)

- ☐₁ Protection against small floods
☐₂ Protection against big floods
☐₃ Protection against all floods
☐₄ Don't know

11. Which of the following elements make up your community's public flood warning system? (Tick all that apply)

- ☐₁ Don't know
☐₂ Sirens
☐₃ Mobile public address systems
☐₄ Flashing lights
☐₅ Radio and TV announcements
☐₆ Information on the internet
☐₇ Door-knocking by the local emergency services or local flood wardens
☐₈ There is no warning system
☐₁₉ Other (please specify_____)

12. If you heard a flood warning for your community what would you do? (Tick all that apply)

- ☐₁ Don't know
- ☐₂ Meet at a designated evacuation centre or assembly point
- ☐₃ Stay inside and wait to be told what to do
- ☐₄ Listen to the radio
- ☐₅ Listen to the TV
- ☐₆ Evacuate at once
- ☐₇ Evacuate at a later stage
- ☐₈ Stay at home
- ☐₉ Go and check the river
- ☐₁₀ Contact your neighbours
- ☐₁₁ Contact the local council
- ☐₁₂ Contact State Emergency Service (SES)
- ☐₁₃ Contact another emergency service
- ☐₁₄ Check the internet
- ☐₁₅ Other (please specify_____)

13. What number would you call for help in a flood? (Tick only one)

- ☐₁ Don't know
- ☐₂ 000
- ☐₃ 1800 201 000
- ☐₄ 132 500
- ☐₅ 131 700
- ☐₆ Local council
- ☐₇ Other (please specify_____)

14. Who would you contact for road information in a flood? (Tick all that apply)

- ☐₁ Don't know
- ☐₂ Local council
- ☐₃ State Emergency Service (SES)
- ☐₄ RTA (Roads and Traffic Authority)
- ☐₅ Police
- ☐₆ Fire Authority
- ☐₇ Neighbour
- ☐₈ Other (please specify_____)

**15. If you were told to evacuate your property during a flood, would you:
(Tick only one)**

- ☐₁ Do nothing – stay put
- ☐₂ Wait until the water reaches my house and then decide
- ☐₃ Go immediately when told
- ☐₄ Wait for the council / emergency services to ‘door-knock’ my house
- ☐₅ Use the phone to call for help to evacuate
- ☐₆ Don’t know
- ☐₇ Other (please specify_____)

16. If you are driving and come across a flooded area of road which is not marked with a ‘road closed’ sign – would you: (Tick only one)

- ☐₁ Continue on with care
- ☐₂ Go back
- ☐₃ Wait for assistance
- ☐₄ Don’t know
- ☐₅ Other (please specify_____)

17. If there was a ‘road closed’ sign on a flooded area of road, would you: (Tick only one)

- ☐₁ Continue on with care
- ☐₂ Go back
- ☐₃ Wait for assistance
- ☐₄ Don’t know
- ☐₅ Other (please specify_____)

18. In a flood, how would you prefer to receive information about that flood? (Tick all that apply)

- ☐₁ Radio
- ☐₂ TV
- ☐₃ Door-knocking
- ☐₄ Mobile public address
- ☐₅ Internet
- ☐₆ Email
- ☐₇ Siren
- ☐₈ Flood Warden
- ☐₉ Telephone
- ☐₁₀ SMS (Text)
- ☐₁₁ Don’t know
- ☐₁₂ Other (please specify_____)

The following set of questions asks about floods and what to do to get ready for them.

19. Have you heard or received any information about preparing for floods from any of the following places? (Tick all that apply)

- ☐₁ I haven't heard or received any information about floods
- ☐₂ Local council
- ☐₃ SES (State Emergency Service)
- ☐₄ Federal government (national level)
- ☐₅ Fire service
- ☐₆ Police
- ☐₇ Bureau of Meteorology
- ☐₈ Television
- ☐₉ Radio
- ☐₁₀ Newspapers or magazines
- ☐₁₁ Meetings, seminars or workshops
- ☐₁₂ Businesses (e.g., pamphlets in power or phone accounts)
- ☐₁₃ School hand-outs (e.g., brochures, homework)
- ☐₁₄ Friends or relatives
- ☐₁₅ Service organisations (e.g., the Red Cross)
- ☐₁₆ Neighbourhood Watch groups
- ☐₁₇ Where you work
- ☐₁₈ Posters or postcards
- ☐₁₉ Telephone book / street directory
- ☐₂₀ My insurance company/agent
- ☐₂₁ Flood warden
- ☐₂₂ Internet
- ☐₂₃ Email
- ☐₂₄ SMS (Text)
- ☐₂₅ Other, specify _____

20. Have you asked any of the following people, groups or organisations for information on how to get ready for floods? (Tick all that apply)

- ☐₁ No, I haven't asked anyone
- ☐₂ Friends
- ☐₃ Neighbours
- ☐₄ Relatives
- ☐₅ Local council
- ☐₆ SES (State Emergency Service)
- ☐₇ Federal government (national level)
- ☐₈ Police
- ☐₉ Fire Service
- ☐₁₀ Bureau of Meteorology
- ☐₁₁ Business establishments
- ☐₁₂ My workplace
- ☐₁₃ My child's school
- ☐₁₄ Other, (please specify _____)

21. How would you prefer to get information on how to prepare your household / business for floods? (Tick all that apply)

- ☐₁ Brochure received in the mail
- ☐₂ Brochure picked up from an organisation
- ☐₃ Radio advertisement
- ☐₄ TV advertisement
- ☐₅ Fridge magnet received in the mail
- ☐₆ Home visit by State Emergency Service (SES)
- ☐₇ Newspaper or magazine advertisement
- ☐₈ Community display
- ☐₉ Internet
- ☐₁₀ Public meeting
- ☐₁₁ Other (please specify _____)

22. Please indicate on the scale, whose responsibility you believe it is to protect us from floods. (Tick one in each row)

	Not at all $\xleftarrow{\text{(Scale)}} \xrightarrow{\text{A great deal}}$				
Federal Government	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
State Government (State Emergency Service)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
Local Government (local council)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
Individual households (mine)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

23. Please indicate on the scale how much you agree with the following statement: (Tick only one)

	Not at all $\xleftarrow{\text{(Scale)}} \xrightarrow{\text{A great deal}}$				
There is no use preparing for floods as we can't do much anyway	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

24. Which of the following have you or your family done to prepare for an emergency? (Tick all that apply)

- ☐₁ Made sure I/we have a portable radio
- ☐₂ Made sure I/we have a torch
- ☐₃ Made sure I/we have spare batteries
- ☐₄ Made sure I/we have a first aid kit
- ☐₅ Made sure I/we have rubber gloves
- ☐₆ Made sure I/we have candles and waterproof matches
- ☐₇ Made sure I/we have a waterproof bag for valuables
- ☐₈ Made a list of emergency contact numbers
- ☐₉ Stockpiled water and food for three days
- ☐₁₀ Picked an emergency contact person outside of the district
- ☐₁₁ Arranged for someone in family to learn first aid
- ☐₁₂ Found out if we are in an area particularly vulnerable to flooding
- ☐₁₃ Had home inspected for preparedness
- ☐₁₄ Talked to family members about what to do if a flood warning is heard.
- ☐₁₅ Thought about how to lift precious items off the ground in a flood
- ☐₁₆ Considered how to access the roof in a flood
- ☐₁₇ Considered access to essential items needed in a flood (e.g. rope for securing items so they do not float away).
- ☐₁₈ Prepared a home flood plan
- ☐₁₉ Prepared an emergency kit
- ☐₂₀ Other (Please specify _____)
- ☐₂₁ I/we have done nothing to prepare for an emergency

25. To what extent might each of the following prevent you from preparing for floods: (Tick one in each row)

	Not at all	(Scale)			A great deal
	←			→	
Cost	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Skill required to prepare	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Time to prepare	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Other things to think about	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Need for co-operation with others	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Lack of knowledge or information	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

26. To what extent do you believe that: (Tick one in each row)

	Not at all	(Scale)			A great deal
	←			→	
Floods are too destructive to bother preparing for	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
A serious flood is unlikely to occur during your lifetime	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
It is unnecessary to prepare for floods as assistance will be provided by the local authority and/or the emergency services	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Floods are not of concern	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

People respond in different ways to natural disasters. The next few questions are designed to help us better understand how your community may respond to a future event. Remember all information given will remain confidential.

- 27. Below is a list of statements on how you feel about living in your community. Please use the scale below to show how much each statement applies to you, or doesn't apply to you. (Tick one in each row)**

	Doesn't apply	←.....	(Scale)→	Applies strongly	
I feel a part of this community	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I am satisfied living in this community	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I am a useful member of this community	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I have the same values and beliefs as my neighbours	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I feel I don't belong in this community	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I am interested in knowing what goes on in this community	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I would be happy to leave this community	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I know my neighbours and/or other community members	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I have no active involvement in this community	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

- 28. Please think about your life in your community at present. Choose a number from the scale below that shows how much you agree or disagree with each of the following statements. (Tick one in each row)**

	Disagree Strongly	←.....	(Scale)→	Agree Strongly	
I feel I have control over the things that happen in my life and in the community	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
There is no way I can solve some of the problems I have by myself	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
I can't do much to change what happens in my life or in the community	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
Somehow problems in my life usually solve themselves	<input type="checkbox"/> ₁		<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

The next set of questions concerns information about you and your household. We will only use this information to improve emergency preparedness in your community. Please remember that the information is anonymous.

29. Do you, or someone in your house, own or rent the home you live in? (Tick only one)

- ☐₁ Own or buying, to live in it
☐₂ Own or buying, but only for use as a holiday home
☐₃ Rent, to live in it
☐₄ Rent as a holiday home
☐₅ Other (please specify _____)

30. How long have you lived in your community?

_____ years _____ months

31. How long have you lived in your current home?

_____ years _____ months

32. How many storeys does your house have?

Number of storeys excluding basement and loft/attic: _____

33. Is your house raised above ground level? (Tick only one)

- ☐₁ Yes
☐₂ Not sure
☐₃ No

If "Yes", please estimate in centimetres how high it is raised up _____

34. Are you insured against floods? (Tick only one)

- ☐₁ Yes
☐₂ Not sure
☐₃ No

33. What is your gender? e.g. male, female (please specify)_____

35. Which best describes the situation you are living in now? (Tick only one)

- ☐₁ Couple family with children
☐₂ Couple family without children
☐₃ One parent family
☐₄ Other family
☐₅ Alone
☐₆ With other people, not family
☐₇ Other, specify _____

36. What is your ethnic background? (Tick only one)

- ☐₁ Australian
☐₂ Aboriginal or Torres Strait Islander origin
☐₃ Other, specify _____

37. Were you born in Australia? (Tick only one)

- ☐₁ Yes
☐₂ Not sure
☐₃ No

If 'No', how long have you lived here?" (Please specify) _____ years

38. How old are you? (Tick only one)

- ☐₁ 18-24 years
☐₂ 25-44 years
☐₃ 45-64 years
☐₄ 65 years and over

.....
39. Are you? (Tick only one)

- ☐₁ Employed full-time
☐₂ Employed part-time
☐₃ Not in paid employment

40. What was your household's total 2004 income (before tax)? (Tick only one)

- ☐₁ Under \$10 000
☐₂ \$10 001 to \$15 000
☐₃ \$15 001 to \$20 000
☐₄ \$20 001 to \$30 000
☐₅ \$30 001 to \$40 000
☐₆ \$40 001 to \$50 000
☐₇ \$50 001 to \$60 000
☐₈ \$60 001 to \$70 000
☐₉ \$70 001 to \$80 000
☐₁₀ \$80 001 to \$90 000
☐₁₁ Over \$90 000

41. What is your highest educational qualification? (Tick only one)

- ☐₁ No school qualifications
- ☐₂ School qualifications
- ☐₃ Trade certificate or professional certificate (TAFE) or diploma
- ☐₄ University undergraduate degree (e.g., diploma or bachelor's degree)
- ☐₅ University postgraduate degree (e.g., Master's, Ph.D.)

**Thank you for filling in this questionnaire.
The information will help us make
your community more prepared for floods.**

**PLEASE RETURN THIS QUESTIONNAIRE
IN THE SUPPLIED POSTAGE PAID ENVELOPE.**



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